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1 Safety

1.1 General information

The following only covers safety hazards which are subject to the service and care jobs of the machine being carried out by the operating staff. Maintenance and repair jobs for which a special knowledge would be necessary and to be achieved only by specially trained personnel, require further special trainings with regard to the particular safety regulations. These security hints may by no means be regarded as a substitute for the observation of the valid accident prevention regulations and norms.

1.2 Use of safety instructions and pictograms contained in the operation manual

HINT! Important hint regarding function. Non-observance may cause malfunctions. This pictogram marks important hints.

HAZARD BY ELECTRICAL VOLTAGE! Injuries would be possible. Non-observance may cause serious damages to health or to property.

GENERAL RISK! Injuries would be possible. Non-observance may cause serious damages to health or to property.

1.3 Intended use

All the operations which the plant is intended to perform are set out by KHS in the so-called technical specification. Every purchase contract between customer and KHS defines which beverages the plant is to fill into which containers (bottles, cans). If the user departs from this specification, risks can ensue for personnel and machine. If the user does not adhere to the terms of contract, KHS bears no liability whatsoever.
1.4 Non-intended use

The machine has been exclusively designed for packaging of such products, which are explicitly described in the separate manual for the conversion of formats. Any other use of the machine and the pertaining units and conveyor belts ahead from this, will be regarded as not duly – non-intended use.

In case of any improper use of the automatic packaging machine or of its components the CE-Conformity will no longer be applicable. The user is solely responsible.

1.4.1 Warning of obvious misuse

If the plant is used in combination with machines from a different manufacturer, operating safety and quality is no longer guaranteed. If you wish to combine the filling plant with other machines or machine parts, you must discuss the planned configuration with KHS specialists. Also, a contract should be drawn up defining who has the authority to give instructions for work on and around the plant. The user is solely responsible.

Any essential change of the content of bottles, cans or receptacles is only acceptable upon the formal approval of the machine manufacturer. The manufacturer cannot be made responsible for any damages caused by non-observance of this instruction.

It is not allowed to use the film shrink tunnel for packaging:

for example:

- Cans which are under pressure, like aerosol cans, if the tunnel is not specially designed for such products.
- Explosive goods like firework articles
- Easily flammable goods, like petrol and solvents
- Living creatures and plants.
1.5 Hazard-free operation

If it has to be assumed that a safe operation would no longer be possible, the machine has to be put out of action and to be secured against unintentional operation! A hazard-free operation is considered to be no longer possible, if

- the packaging machine shows visible damages
- the machine is no longer properly working
1.5.1 Safety signs at the machine

These symbols are used in the instruction manuals and at the machine to draw attention to safety advice and the need to follow such advice to avoid the danger to life and limb.

The hints have to be observed unconditionally. Special caution should be exercised

DANGER! Possibility of injury
Non-compliance can cause severe damage to health or property

DANGER! Possibility of combustion
Non-compliance can cause severe damage to health or property.

DANGER! Possibility of injuries by cutting crushing at movable parts.
Non-compliance can cause severe damage to health or property

Danger! In order to avoid possible eye injuries do not look directly into the laser light beam when positioning film reels on the film reel mandrel. Laser : classification 1 - generally recognised as safe

DANGER! Possibility of cutting damage.
Non-compliance may cause severe damage to health or property

DANGER! Possibility of injury by electric shock due to dangerous voltage possible.
Non-compliance may cause severe damage to health or property

DANGER! Wear protective goggles!
Non-compliance can cause severe damage to health or property

DANGER! Wear protective gloves!
Non-compliance can cause severe damage to health or property

DANGER! Wear protective shoes!
Non-compliance can cause severe damage to health or property
1.5.2 The employer must issue operating instructions

The employer undertakes to observe, implement and control adherence to the required accident-prevention regulations. Unless there is strict and consistent adherence to these regulations and to the additional safety rules in this chapter and in the operating manuals, risks to personnel and damage to machinery will be inevitable.

The employer undertakes to display the required prohibitive and cautionary notices on the operating premises, at the entrances and on the machines. Furthermore, the employer must ensure that these cautions are strictly observed.

1.5.3 Obligations of the employer vis-à-vis the manufacturer

The employer undertakes to immediately report to the manufacturer any accident or damage to the machine which is presumed to have been caused by mechanical failure. If the employer plans modifications to the machine, these must be discussed with the manufacturer before implementation. The manufacturer can only meet his product-monitoring obligation in the interest of the user if the latter keeps him informed.
1.5.4 Protective devices

1.5.4.1 Protective bonnets

The protective bonnets serve as a protection against ‘grasping’ into the machine, as well as against product parts being expelled out of the machine and as noise protection as well.

Locked, separating protection facilities, will switch-off the machine automatically, if doors or protection devices are being opened which have been secured with limit or proximity switches. Fixed protective coverings have been provided at potential hazard areas, if accessibility is not required for the proper operation and or periodical maintenance jobs.

These are firmly interconnected with the machine and, in order to detach them it will be necessary to use tools. Such protections should not be removed during the operation of the machine. If they have been removed, machine must not be started.

The additional safety devices which KHS has provided, such as protective doors, grids, glass covers, light barriers, control devices, load-limited devices, safety valves and emergency-off switches may never on any account be bypassed or put out of action.

See also description in chapter 5.3.4 „Protection devices”

1.5.4.2 Emergency stop buttons

At the machine there are several yellow/red mushroom-type emergency stop buttons by means of which the machine can be stopped immediately in an emergency situation.

Only use the emergency stop buttons for stopping the machine in an emergency situation - Do not use for normal machine stops!

When an emergency stop button is operated the machine and tunnel stops.

A red blinking sign in the machine diagram indicates which emergency stop button has been operated.

See also description in item 5.3.1 „Mushroom-type emergency stop button“
1.5.5 Demands on the operation, service and maintenance personnel

The following safety regulations have to be observed under all circumstances! Not observing the regulations can result in burns and other injuries over even death, e.g. caused by electricity, and/or in damage caused to equipment or property!

Independently of the safety regulations below, the following
- Applicable accident prevention regulations;
- Generally recognised technical safety regulations;
- EC-guidelines or other specific national agreements.

Also belonging to the intended use:
- Reading and following the instructions in the operation manual
- Observing the inspection and maintenance instructions
- Utilization of the determined incidentals

The personnel responsible for operating, maintenance, servicing and assembly must have the qualifications required for the work involved (training and qualifications must be up to the KHS standard). The employer must clearly define areas of responsibility and reporting relationships and ensure close supervision of personnel. If personnel do not have the required qualifications, they must be given the necessary training and instruction.

Personnel delegated to work on the machine must have read the operating instructions and in particular those sections dealing with safety before being employed on the machine.
All safety instructions and warning signs exhibited on the machine should be strictly observed.

Such instructions and signs should be complete and perfectly legible at all times.

Do not take intoxicants
The rule for operating and maintenance personnel carrying out work on or around the plant is:
- The consumption of alcohol or other intoxicating substances can entail danger to yourself and others.
- For this reason you may not perform any work on the system under the influence of alcohol or any other intoxicating substances.

One operator supervises the biggest part of production

Always observe the safety regulations for employees working on their own in accordance with VBG 1 §36 sec. 3.
Cause for injuries may be insufficient free scope in the operation area. The operating company has to take care that the existing areas which are necessary for operation, maintenance and service, will be kept free and unrestricted.

Only water should be used to clean the outside of the machines. Never use substances which corrode the surfaces of the machines. Remember that toxic emissions can occur as a result of chemicals, fumes and gases. Additional information on cleaning agents and their usage is included in each operating manual.

The user of the plant must select the cleaning agents carefully. They contain various chemical substances in different levels of concentration, which in some circumstances can cause damage both to humans and machine. Cleaning agents are available on the market which contain substances listed in the Dangerous Substances Act. These cleaning agents should be avoided wherever possible. If you apply cleaning agents which can put the operator at risk, you must inform him/her accordingly.

Where dirt has been allowed to accumulate, it may be necessary to use very aggressive chemical agents in order to clean the parts thoroughly. Such aggressive agents are acids and alkalis and a major hazard both to humans and machines. Ensure that you never mix chemicals which are not intended to be put together. The result can be gases and fumes which irritate the skin or breathing.

If machines are equipped with hand holes or manholes, these are to be used solely for the purpose of fitting spare parts and cleaning. No one must ever enter the machine through a handhold or a manhole.

Minor injuries sustained during assembly are usually caused by slipping with a tool. Use only tools in perfect condition for assembly operations. The operating manual contains information about the special tools required.

Take care when assembling or dismantling parts which are under mechanical tension or under gas pressure, because here there is a risk of high "potential energy". This potential energy can occur in various forms, e.g., spring pressure, gas pressure or vacuum. Such parts may only be assembled or dismantled by a specialist. Each operating manual contains information about such machine parts.

For safety reasons, use only original KHS spare parts.
• Disconnect main switch for all jobs at the machine, in particular when dealing with those components which are under voltage. Secure against restoring power
• Repair work may only be achieved by the service personnel or by persons authorised for this type of job.
• Please use for replacement genuine spare parts only.
• Carry out any jobs at the machine only if the plant has been cooled down – Danger of burning!

If lubricants may get in contact with food, the lubricants themselves have to consist of food fats. Food fats do not differ externally (optically) from mineral or synthetic fats.

• Comply with the lubricant chart contained in chapter “Maintenance“.
1.5.6 Residual risks on operation

1.5.6.1 Process module “product supply“

During packaging of glass bottles glass break may occur. Bursting of the glass bottles may cause an uncontrollable throwing out of glass fragments (splinters). Therefore,

- wear personal protection equipment (such like protective clothing, protection gloves, goggles)

During packaging of glass bottles glass break may occur. When clearing the plant, the operating personnel runs the risk of cutting damage caused by cullets lying around. Therefore,

- wear personal protection equipment (i.e. protective clothing, protection gloves, goggles)

The centre of impact at the motion rods and the cylinders which project into the travelway.

- Take care for sufficient free scope.

Contact point at the moveable guide rails and the cylinders

- Do not grasp into the area of moveable guides

1.5.6.2 Process module “Formatting“

During packaging of glass bottles glass break may occur. When clearing the plant, the operating staff runs the risk of cutting damage caused by cullets. Therefore,

- wear personal protection equipment (i.e. protective clothing, protection gloves, goggles)

The adjustable guide rails project out of the machine and, with this, pose a risk as a stumbling point.

- Care for sufficient free scope.

All chain areas include the risk of various crushing and draw-in hazards during the assembly and the commissioning of the machine.

- Please, have these jobs done only by specially trained and experienced persons, which have been explicitly made aware of residual risks

The servomotors can absorb high temperatures. This may pose a thermal risk.

Take into account the warning advices at the machine.

- After extended service times do not touch the servo motors. If necessary, wear protective clothing.
The use of lubricants can represent an endangering through the contact with dangerous liquids.

- Take in mind the safety data sheets in the appendix. If necessary, wear protective clothing.

### 1.5.6.3 Process module “Folding“

At all V-belts and chains exists the risk for the personnel of various crushing and draw-in hazards during the assembly and commissioning of the machine

Please, have these jobs done only by specially trained and experienced persons, which have been explicitly made aware of residual risks

The glue application nozzles can assume high surface temperatures representing a thermal endangering for the personnel. Therefore,

- always wear personal protection equipment (protective clothing, protection gloves, goggles)

The glue will be applied onto the cardboard articles under high pressure through the nozzles. The pressure may possible assume 60 bar. Such a high pressure can injure the operator if the glue stream hits him. Therefore, always

- wear personal protective equipment (i.e. protective clothing, protection gloves, goggles)
- take into account the instruction contained in the operation manual of the manufacturer.

The glue may absorb high temperatures, representing a thermal endangering for the personnel during the process of refilling.

- Follow the warning advices at the machine
- Wear personal protective equipment (PPE) like protective clothing, protection gloves, goggles

The high temperatures of the glue cause exhalations which may lead to irritations when breathed in over an extended period.

- If possible, do not breathe in the vapours. Possibly wear a respirator mask
1.5.6.4 Process module “Film Wrapping“

When feeding the machine with foil rolls, the operator has to assume an unhealthy posture, resulting in particular physical burdens.

- Use foil roll cars or other lifting aids

When getting in contact with cutting knives, this can cause cutting or lacerated damages

- Take in mind the warning notices at the machine
- When carrying out jobs at the foil knife, always wear cut-proof gloves

1.5.6.5 Process module “Shrinking“

All chain areas include the risk for the personnel of various crushing and draw-in hazards during the assembly and commissioning of the machine

- Take into account the warning notices at the machine
- Have these jobs done by specially trained and experienced persons only, which have been explicitly made aware of the residual risks

The heating registers mounted at the shrink-tunnel (upper side) can absorb high surface temperatures, representing a thermal endangering for the personnel.

- Comply with the instruction at the machine
- Always wear personal protective equipment (i.e. protective clothing, protection gloves, goggles)
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2 Configuration and function

2.1 General guidelines

Innopack TSP are all-purposes packaging plants producing a multiplicity of TrayShrink Packings out of steady individual products.

The machine is built in modular design. Different modules can be combined together. The combination of the different modules results from the packaging property and the formation (for example film, cardboard etc.).

The blanks feed allows for an easy to handle loading of tray blanks. This will take place continuously via the product group – in combination with the exact folding devices this will achieve precisely fitting total packages. Thanks to the "KHS Kisters Lap Seal"-Technique, the system provides packs without welding bar.

The mode of operation is continuous. Control is made through a PLC, whereas the velocity adapts automatically to the corresponding performance of the production line.

2.2 Machine

The machine brings together and unifies individual or pre-packed products. In the function module ‘formatting’ the products are divided off to the relevant product formation.

These products are placed on a cardboard (TrayShrinkPacker as an option) and wrapped with film.

In the function module “Shrinking” the film will be narrowly placed around the product by the effect of heat.

Illustration can vary due to design
2.2.1 Product infeed

2.2.1.1 Construction of the product infeed

The product infeed is provided with the following components

- drive motor
- guide rails for different formats
- Optional conversion sets for different formats
- sensors for product monitoring
- sensors for the speed control of the machine

2.2.1.2 Working method of the product infeed

The belt conveyor forwards the incoming products into the module ‘formatting’. Depending on an automatic speed control the speed of the product infeed and of the machine is regulated in accordance with the quantity of products

2.2.1.3 Drive motor

The velocity of the conveyor belt is regulated via a panel. Depending on the corresponding speed of the machine, the speed of the feeding belt motor is adjusted accordingly.

Illustration may vary due to different design
2.2.1.4 Guide rails

The different guide rails can set through the adjusting help or in accordance with the formatting tables. See also chapter “reset”

Illustration may vary due to different design

2.2.1.5 Sensors for product monitoring

The sensor “failure product feed “ detects missing products or products toppled down on the feeder belt. The dividing device will be closed; the production flow has to be checked by the operator. The dividing station has to be acknowledged.

Illustration may vary due to different design
2.2.1.6 Sensors for the speed control

The speed control of the machine is controlled through sensors installed on the preceding belts. These sensors register the product pile-up and control the speed of the machine. Optionally these signals can also be transmitted via a bus system.

Illustration may vary due to different design
2.2.2 Formatting

2.2.2.1 Design of the function module “formatting“

The function module formatting consists of various subassemblies
- dividing system
- sensors for the product monitoring
- guide rails for different formats
- blanks magazine
- rotating suction
- blanks transport
- upper drag chain 1

2.2.2.2 Function of the module formatting

Products are being divided into the provided formation. The blanks will be sucked off out of the magazine and placed on a chain conveyor. Cardboard and products will be unified.

2.2.2.3 Dividing system

This divides the product stream into the formatdepending packaging format.
The dividing system consists of up to eight chains and can be adjusted to the different formations. The formatted products, cleared in accurate position will be conveyed to the upper drag chain. For the different formats productdepending dividing tools are being mounted in the seats of the divider chains.

Illustration may vary due to different design
2.2.2.4 Sensors for the product monitoring

These sensors for product monitoring detect toppled down products on the chains of the divider belt. The machine will stop immediately. The operator has to reposition the toppled down products into the formation and restarts the packing machine.

Illustration may vary due to different design

2.2.2.5 Adjustable guide rails above the dividing system

Adjustable guide rails above the dividing system facilitate the handling of different products. Adjustment will be made through central retention elements or individually basing on the formatting table.

Illustration may vary due to different design
2.2.2.6 Blanks magazine

The blanks magazine stores the blanks for a certain time of production. For the exact spacing of the guide rails have been mounted traverses with position indicator. The pressing fixture prevents the positioned cartons from toppling over. The sensor „minimum number of blanks“ controls the minimum quantity of blanks. If the quantity falls below this number, the blank separation will stop. The blank separation restarts if a sufficient number of blanks is available in the magazine. The cartons will be conveyed towards the blank suction by means of pneumatically driven chains. Two light scanners in the anterior area of the magazine will activate the blank feed, if they do not detect any blanks positioned. If cartons have been detected, the blank feed will stop automatically.

Illustration may vary due to different design
2.2.2.7 Blanks separation

The blank separation retains one blank per machine cycle out of the magazine and places it on the blank conveyor chains. Conveyance of blanks and the rotating suction unit are driven by a servo motor.

A vacuum pump generates a vacuum in the suction cups of the “rotating suction unit”, by which a continuous suction of the blanks will be guaranteed. The air filter prevents the system entering from dust. In order to maintain the full capacity of the blank suction installation, the air filter has to be cleaned periodically.

Illustration may vary due to different design
2.2.2.8 Conveyance of blanks

The blank conveyor chains carry the blanks synchronically to the product group. At the 'meeting point’ blanks/product, the blanks will be pushed underneath the product group. The blank conveyor chains are driven by a servo motor.

Illustration may vary due to different design
2.2.2.9 Upper drag chain 1

This transports the product group with the aid of tappets to the meeting point product group/film (optionally blanks). It is driven by a servo motor and controlled by an electronic overload trip. Sensors are monitoring the flow of products.

Illustration may vary due to different design

The inlet area of the upper drag chain 1 houses a pneumatically operated pivoted lever. In the first instance this serves as a chain guide. If the fault appears “product tumbled down behind the separation station”, this pivoted lever will move upwards so that no products can be jammed underneath the tappet of the upper drag chain. If in spite of this a product is jammed underneath a tappet, the pivoted lever will be guided above by means of an overload procedure.

Illustration may vary due to different design
2.2.3 Folding

2.2.3.1 Design of the function module folding

The function module folding consists of various subassemblies
- blank folding chains
- rotating folding tools
- product adaptation
- gluer

2.2.3.2 Features of the function module folding

The pack will be completely folded by means of folding tools and glued at the same time. After that, the pack moves through a press-on passage, in which the hot glue applied is cooling-off and setting. The element is driven by a servo motor. The folding chains are secured by an electronic overload trip in the servo motor.

2.2.3.3 Blank folding chains

Blank folding chains

The blank folding chains consist of folding tappets and—as an option—flight bars (TPFO).
Before application of the hot glue, the folding tappets raise the face and reverse blank edges. The lateral edges are raised by the guides before the carton passes the setting station.
The folding chains can be adapted for the different sizes of cartons.

Illustration may vary due to different design

As an option in case of TPFO:
Flight bars, fixed to the rear folding tappets, transport the product group via the transitions (in case of film handling only) to the upper drag chain II
- width-adjustable for different tray sizes or for handling with film
2.2.3.4 Rotating folding tools

The rotating folding tools push the rearmost glue-on flaps of the blanks in position before application of the hot glue. The tools are protected by mechanical overload couplings.

Illustration may vary due to different design

2.2.3.5 Product pressure

In case of a machine halt during a gluing process, the lateral edges of the cartons are pressed onto the glue-on flaps. This product pressure prevents that open packs are produced due to a dead halt.

Illustration may vary due to different design
2.2.3.6 Glueing

The hot-glue unit heats the glue and forwards the same to the hot-glue spray valves through hoses.

Illustration may vary due to different design

The hot-glue spray valves apply the hot glue well-positioned on the cardboard.

Illustration may vary due to different design

Take into account the operation manual 'hot-glue unit' of the supplier
The hot-glue spray heads can be fed with compressed air through an manual valve, for instance, in order to deaerate the spray heads – see also chapter “Maintenance“.

Illustration may vary due to different design
2.2.3.7 Upper drag chain 2

This conveyors the product group to the meeting point ‘product group/film’ with the help of flight bars. It is driven by the servo motor (axle 7) of the folding station and controlled by an electronic overload trip. Sensors are monitoring the flow of products.

Illustration may vary due to different design
2.2.4 Wrapping

2.2.4.1 Design of the function module wrapping

The function module wrapping consists of:
- film reel arbor
- automatic film weld-on
- film stretcher station
- film tensioning device
- film cutting station
- film conveying system
- film retaining device
- conveyor belt / discharge belt film wrapping system
- film wrapping
- velocity compensation belt
- antistatic device

2.2.5 Function of the module wrapping

The film will be cut to the desired length in the film cutting station and conveyed underneath the product by means of the film transportation system. The film is placed around the pack with the aid of the film wrapping bars.

2.2.5.1 Film reel arbor

The film reel arbors serve for the reception of the film reels. The end of the film will be signalised via photoelectric barriers.

Illustration may vary due to different design
2.2.5.2 Film tensioning device

This device is appropriate to compensate the different reel off speed of the film and the inertia of the film reel, as well. Due to the position of the tensioning device, the brake of the film arbour will be regulated via analogue proximity/approach switches.

Illustration may vary due to different design

2.2.5.3 Film cutting station

The film cutting knife cuts the film into the desired length

Illustration may vary due to different design
2.2.5.4 Film transportation system

After having cut the film, it will be available on the film conveyor ready to be placed underneath the product. A servo motor drives the different conveyor belts.

Illustration may vary due to different design

2.2.5.5 Film retention device

The film retention device above the belt conveyor can be raised or lowered. In the lower position the film retention device picks up the film pieces:
- during trial run, in order to determine the film length cut-off
- after welding of the film, in order to prevent the product group from having generated a film seam.

Illustration may vary due to different design
2.2.5.6 Belt conveyor / discharge belt from the film wrapping system

The conveyors forward the products wrapped with film through the function module wrapping.

Illustration may vary due to different design

2.2.5.7 Antistatic device

Antistatic rods neutralize the static charging of the film. Up to four rods can be connected to the antistatic device.

Illustration may vary due to different design
2.2.5.8 Film wrapping

The film wrapping system consists of two chains which, depending on the product, can support various film wrapping rods. These rods wrap the product with foil. The film wrapping is driven by a servo motor protected by an electronic overload release.

Illustration may vary due to different design

2.2.5.9 Speed compensation belt

The speedy compensation belt compensates the different velocities between machine and tunnel. According to the design, the belt is driven by a servo motor or a geared motor.

Illustration may vary due to different design
2.2.6 Shrinking

2.2.6.1 Construction of the module shrinking

The film wrapped around the package will be closely shrunken on the package by an exposure to heat and the result is a very durable pack..

The module shrinking consists of

- heating zones
- fan motors
- regulation units for the position of the air nozzles
- regulation units for the air quantity
- Conveyor chain drive
- Tunnel cleansing station

Illustration may vary due to different design

2.2.7 Function of the module shrinking

2.2.7.1 Heating zones

The heating zones heat the circulating air and blow it into the air nozzles.
2.2.7.2 Regulation units

The regulation units take care that the air nozzles will be set to fit the different products. The quantity of air required for the products can be set with these regulation units.

Illustration may vary due to different design

2.2.7.3 Conveyor chain drive

The conveyor chain is driven by a frequency-modulated three-phase current motor. The velocity can be set on the panel.
2.2.7.4 Tunnel cleansing station

The conveyor chain of the shrink tunnel can be cleaned with a brush. With cleaning process activated, the rotating cleaning brush is automatically driven towards the conveyor belt in predetermined cycles. Apart from the closing sequences, cleaning of the chain is activated independently through the key „manual cleansing of the chain conveyor“ at the panel.

Illustration may vary due to different design
2.3 Workstations of the machine

2.3.1 General arrangement

- Blank loading

Illustration may vary due to different design

- film reels

Illustration may vary due to different design
2.3.2 Operation devices

- Switch cabinet

Illustration may vary due to different design

- control desk

Illustration may vary due to different design

- operating element upper drag chain
- operating element film station / film wrapping
- operating element film station
- operating element film wrapping
2.3.3 Monitoring information equipment

- electric torch

Illustration may vary due to different design.
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3 Assembly

3.1 General hints and references

We urgently recommend that the machine assembly work be performed by KHS staff or authorized KHS personnel only. KHS will accept no responsibility for damages occurring due to improper assembly work.

Please, take into account the pictograms affixed to the packing.

If the machine is fitted with lifting shackles then do use these! Only use a fork lift truck for smaller items.

On the machine itself labels are used to indicate the places where the forks of a fork lift truck or lift truck may or may not be inserted.

The places at which the forks are not to be inserted are those where mechanical parts extend below the underside of the machine frame
1. Tray-blank magazine
2. Lower tray-blank feed conveyor

The places on the machine where the forks may be inserted are indicated as follows:
3.2 Safety advices

- Make sure that no persons will stay within the danger zone of the material handling plant.
- Take care of wearing the personnel protective equipment, (protection clothing, protection gloves, goggles),
- Remove foreign material (bin or cask parts, wooden pieces, tools, cleaning rags, etc).

Care for proper conditions, i.e.:
- Check whether preparation-, maintenance-, repair or conversion job has been completed and finishing has been fed back.
- Check whether safety barriers have been activated (to be acknowledged only upon elimination of any hazard).
- Check whether the mushroom emergency buttons have been unlocked. Unlocking only upon elimination of any hazard.
- Check whether the safety-, control- and operation devices are in a reliable and safe operational condition.
- Before trial run also check the up- and downstream material handling devices in view of proper working condition!
- For disposal of transport packing take care of the adequate tools

Safety advices to be observed during transportation to the storage/installation location
- Only use appropriate means of transportation due to the proper weight and dimensions

Have trial run carried out by the KHS staff only or by personnel authorised by KHSP!
3.3 Transportation

- Observe the maximum for lifting equipment
- Weights see under "Technical data"
- Lifting of the plant is only permitted by using the sling aids indicated.
- It must be ensured that the hoist and the lifting devices satisfy the necessary requirements. In this respect, particular attention must be paid to the load-bearing capacity of the hoists.
- The accident-prevention regulations "Load-Suspension Devices in Hoisting Operation" VGB 9a as well as the relevant regulations of the employers' liability insurance associations for loading by crane must be complied with.
- If the regulations are not complied with, there is a risk of serious bodily harm or considerable damage to property.
- Machine to be transported only dismantled.
- Never lift the complete mounted machine.

Do not lift the tunnel at the eye bolts at the tunnel hood. These only serve for dismounting the shrinking hood.

Lifting the tunnel at the front ends (inlet or outlet) or loading by means of a crane only by using the corresponding handling aids.

For displacement of the handling aids, loosen the screws inside the frame

- The machine can be transported using a forklift truck or similar.
- When transporting using a forklift truck, both lower side frames must rest on the fork!
- Position the forks only into the area of the hint-shields at the bottom machine-frame
Shift the handling aids to reach to the foot elements at the inlet and outlet and secure them

Lifting the tunnel at the front ends (in- and outlet)

Crane

- When handling by crane, fasten lifting straps at marked positions only.
- In order to prevent damage to machine casings, lifting spreader-bars must be used.
- Comply with the max. stop angle of 60°!
- Take in mind gravity centre of the machine; choose length of the lifting belts in such a way that machine is lifted horizontally in balance.

Shift handling aids to position and secure them:
It is implicitly to use a lift bridge. Consider the length of the lifting ropes in such a way that the max. shifting square will be 60°

Handling by crane
Mount the fixing angles supplied with the installation

Disassemble handling aids upon completion of erection and store them
3.4 Intermediate storage

Should it become necessary to place machines and/or components in intermediate storage, then the following conditions must be provided in order to avoid damage to any components sensitive to temperature, moisture, and corrosion.

- Protect the machines and their components against dirt, dust, and paint particles. Cover the machines with plastic foil.
- Store at a room temperature of between -10°C and +50°C.
- Prevent the accumulation of condensation in and on the machine.
- Provide adequate ventilation.
- Avoid exposing the machine to solvent, acid, and caustics vapours in the immediate vicinity of the machine.
- Place the machine on an even surface. Ensure that the machine is supported evenly by all foot spindles.
3.5 Installation

The installation should be performed by special fitters of Messrs. KHS only. Assembly will take place in between the individual machine components (Depalletiser, unpacker, packer, etc.). Any adaptation of the conveyors in case of smaller deviations can be easily carried out in situ, if necessary. The installation is also to be based upon the project engineering plan.

The installation site is specified in the planning documents. However, in any event it should be ensured that sufficient space is available for maintenance and repair work, not only on the machine itself but also on the container conveyors.

You should also ensure that the installation site is not located in a high disturbance area. Avoid placing the machine high noise areas and in the vicinity of water, falling containers or packaging, broken glass, heavy accumulation of dirt, acids, caustics, etc.

The flooring of the installation site requires sufficient firmness. Refer to foot spindle load ratings in the "Technical Specifications" chapter. The flooring should be even, smooth, and, as the surrounding walls, should be easy to clean.

The machine is shipped completely assembled to a greatest possible extent. Certain parts must be reassembled in the machine in those instances in which it was necessary to partially disassemble the machine prior to shipment. Please observe the following during installation:

- Place the container infeed and discharge with regard to space according to the project plan. The conveyor belt connections must not be rearranged.
- Align the individual components of large machines. Observe the markings when coupling the machine elements.
- Adjust the machine exactly using the foot spindles.
- Use a level to align the machine.
- Make certain that the lock nuts on the foot spindles are secured.
3.6 Connection

Electrical connection

- The electrical connection is made directly at the master switch in the control cabinet.
- See circuit diagrams for mains supply and fuse protection.

The equipment required for the electrical machine control is located in a separate switch cabinet, which, depending on the project, can be placed in various positions in relation to the machine.
All of the devices built in the machine are connected to a terminal strip in the operator panel or in the terminal box.
The individual terminals in the switch cabinet and in the filler are marked according to DIN/VDE.
Check mains voltage before first starting-up.
See also the chapter “Technical Data”

Prior to start-up of machine check whether the electrical rotary field is clockwise rotating. In case of connection to an anti-clockwise rotating field, some motors would run into the wrong direction which may lead to damages and malfunctions.

- Check rotary field by means of rotating field instrument
- Check connection in compliance with the relevant country regulations
- Check safety measures (earthing) in compliance with the relevant country regulations

Compressed air supply

The compressed air connection is made directly at the air servicing unit.

Check the compressed air supply before first starting-up.
See also the chapter “Technical Data”
3.7 Establishing Readiness for Operation

Before switching the machine on, check that

- nobody is present in the danger range of the machine.
- all protective devices, control elements and instruments are working.
- all foreign objects (tools, cleaning rags, etc.) have been removed from the machine.
- all lubrication and operation material have been filled-up,
- supply of compressed air, water and electrical energy is available.
- Presently existing machines from other suppliers have to be operative.

Check before first trial run, whether:

- the mechanical adjustments for the format have been tuned correctly
- the right format has been chosen in the operation panel

The curtains mounted at the in- and outlet of the shrinking hood serving as a heat insulator have to be slit in accordance with the dimensions of the packaged good:

- Place packing into the middle of the conveyor belt.
- Slit curtain into abt. 50 mm wide strips with a scissors, according to the packaging size.

3.8 Storage

See also chapter “Intermediate Storage“ and

- During extended periods of intermediate storage (> 4 to 5 months), check whether or not the batteries in the PLC are intact and if the program and all its components are still stored. When in doubt, check with KHS personnel or authorized KHS personnel.
- Variable program components may be entirely or partially lost during extended periods of intermediate storage or if the capacity of the buffer batteries is insufficient. The electrical wiring data in the switchboard cabinet also contain a storage medium containing the original control programme, i.e. the initial program edition may be reconstituted (undone) at any time.
3.9 Disposal

When you have to dispose of all kinds of waste (e.g., fuels, residues, cleaning agents) observe the relevant laws, orders and regulations concerning waste-disposal measures and channels. Each machine has its own subassembly-related operating manual. This manual contains information about possible waste materials. Guidelines are included for the correct disposal of scrap, packaging or auxiliary materials waste, and possible leakages. Factors to pay attention to include:

- protective equipment for staff;
- waste-disposal containers;
- absorbents, neutralizing agents, fire-extinguishing agents;
- cleaning methods;
- transportation regulations.

Operating and maintenance personnel must be kept regularly instructed and informed about the relevant laws/regulations so that they can take suitable action in the event of specific danger from harmful substances. Specifically, this involves immediate effective actions in a particular situation (switching off, securing, emergency devices) and clearly defined responsibilities.
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4 Operation

4.1 Generals

In this chapter the operation of the machine and according to the actual machine version, the menu structure on the screen are described. In addition, the setting and adjusting actions required to be taken after assembling, disassembling and reconstruction measures are explained.

4.2 Safety instructions

Observe the safety instructions in the chapter „Safety“, in every case. Ignoring may lead to burning, injuries and even death, for example, by electricity and / or damage in equipment and property!

The personnel for operation, maintenance, inspection and assembly has to be properly qualified for these activities (training and instruction have to correspond to the KHS standards).

The user has to clearly define the area of responsibility, competence and supervision of the personnel. If the personnel lack the required knowledge, then the staff is to be trained and instructed.

The personnel in charge with intervention into the machine have to carefully read as well as understand the operating manual and in particular, the chapter “Safety instructions”.

Observe all danger as well as safety instructions in the machine and keep them in readable condition.

Do not take any drugs.

The operators and maintenance staff, who work in and around the machine and peripherals have to obey to the following rules:

- Taking alcohol or other drugs endangers both the operator and other persons.
- Do not work in the machine and peripherals under the influence of alcohol and other drugs.

One operator supervises the major part of production.

Observe the safety measures for separately working operators according to VBG 1 §36, section.3:

- Before start of any operation in the machine and peripherals, in particular, live parts, disengage the main switch and lock from re-engaging.
- The service or authorised personnel only are allowed to repair work.
- In case of need, use for repairs original spare parts only.
- Intervene in cooled down machine and peripherals only - danger of burning!
4.3 Safety devices

4.3.1 Emergency stop buttons

Only use the emergency stop buttons for stopping the machine in an emergency situation - Do not use for normal machine stops!

Location of the Emergency Stop Buttons:
- At the operator’s control panel
- At the film wrapping section
- At the main control enclosure
- At the shrink-tunnel

When an emergency stop button is operated the machine and tunnel stops. A red blinking sign in the machine diagram indicates which emergency stop button has been operated.

In machines equipped for film processing:
After the emergency situation has been eliminated, empty the tunnel as quickly as possible, see chapter “Handcrank”.
4.3.2 Start after emergency stop

Before the machine is restarted after an emergency stop the following action may need to be taken.

**Feed Conveyor**
- Check for fallen products

**Collating System**
- Check for fallen products
- Re-arrange already collated product groups which might have been disarranged.
- If necessary empty and refill the collating system.

**Pusher Bar Chain I**
- Check for fallen products.
- Re-arrange product groups which might have been disarranged.

**Blank Feed System**
- Check the quality of the blanks
- Check the position of the blanks

**Hot-melt Unit**
- Check the hot-melt gluing heads, the guides, etc. Clean all parts which are covered with hot-melt residues or other dirt.

Read and observe the safety guidelines stated in the manufacturer’s documentation.

**Folding Chains**
- Check that the folding chains are free of hot-melt residues or carton remainders, etc. Clean if necessary.
- Check the folding flight attachments.

**Pusher Bar Chain II**
- Check for fallen products.
- Re-arrange product groups which might have been disarranged

**Film Cutting Station and Film Feed System**
- Check the condition of the film cutting knife.
- Check that the rubber rollers are clean.
- Check the film feed conveyors, position and clean state
- Check the piece of cut film on the film feed conveyors

**Film Wrapping Section**
- Check the piece of film on the film feed conveyor. If necessary remove the piece of film.
- Check the film wrapping bars.
**Film Shrink Tunnel**
- Check the speed compensation band in front of the tunnel
- Check the tunnel conveyor band
- Check the film wrap at the transfer section to the tunnel
- Check for fallen products

**Starting the Machine**
Deactivate the emergency stop button that had been operated by pulling out the mushroom-type head or by turning the key.
- Press the button “CLEAR FAULT”
- Operate the button ”FAULT RESET”.
- The red segment of the pillar lamp extinguishes.
- Operate the button ”PRE-START ON”.
- See whether there are fault messages displayed on the monitor screen. If this is the case remove the fault.

- Operate the button ”MAIN DRIVE ON”.

Switch on tunnel in menu „Tunnel operation“
- Operate the button ”Tunnel ON”.
- Switch „Heating“ to „1“.
4.3.3 Hand crank shrink tunnel

- See information on the „Emergency Stop“ facilities in the Instruction Manual
- The hand crank cannot be fixed on the journal while the tunnel is running!

Empty the tunnel by means of the hand crank, e.g. in case of:

- activation of the emergency Stop pushbutton at the tunnel,
- tension failure
- failure of the tunnel drive. To drive products out of the tunnel in case of:

The illustration may be different according to the actual version.

- Fitting the handcrank, both the heating and transport conveyor are shut-off by the safety limit switch.
- The display in the control panel shows the fault indication "Fault hand crank"
- Fit the handcrank and drive the transport conveyor in operating direction until all products are out of the tunnel

- Remove the hand crank
- Reset fault by pressing button „FAULTRESET“
- Activate ”PRE-START ON”.
- Switch „Heating“ to „1“.

Switch on tunnel in menu „Tunnel operation“

- Operate the button ”Tunnel ON”.
- Switch „Heating“ to „1“.
4.3.4 Safety Temperature Cut-out

The safety temperature cut-outs protect the heated zones from overheating. The cut-out temperature can be set by means of a rotary potentiometer (c) at the safety temperature cutouts.

- Loosen the two fixing screws at the cover of the safety temperature cut-out housing and remove the cover.
- Adjust the rotary potentiometer (c) to the desired cut-out temperature
- (factory setting = 500°C).
- Mount the cover and re-tighten the two fixing screws.

When the cut-out temperature has been reached (500°C factory setting) the heating system is switched off and the fault message “Overtemperature- heated zone x” is displayed on the monitor screen.

Find the cause of the overheating and remove the fault.
Check that the intake zones are free, if necessary remove film rests.

- Check that the motor is functioning correctly and that the air can circulate freely.
- For re-starting the heating system after a cooldown remove the protective cover (a) and press the re-start pushbutton (b). Mount the protective cover again.
- Reset fault by pressing button „Fault Reset“
- Activate „PRESTART ON“

Switch on tunnel in menu „Tunnel operation“

- Activate „Tunnel On“
- Switch „Heating“ to „1“
4.3.5 Safety Devices

Indications to special dangers and hazards
- Protection against reaching into the machine in action
- Observe the following labour protection instructions:
  - Do not operate the machine in any hazardous manner.
  - Operate the machine in safe and functioning state.
  - Test the safety-technical installations at least once a shift.
- Open the safety devices on the operator side by shifting upwards the safeguards.
  ➔ Time-delayed stopping of the machine
- Open the safety devices on the far side to the operator’s place by lateral shifting of the safeguard.
  ➔ Quick-stop of the machine, the machine stops following a pre-adjusted slowing-down ramp.
- Test the safety switches on the safeguards.
  ➔ LED-displays extinguish when opening the safeguards.
  ➔ Observe the fault messages on the screen.

All safety devices at the machine have to be closed before starting the machine. There are two types of safety devices:
- Safety devices on the operating side
- Safety devices on the far side of the machine.

Opening the safety devices on the operating side
The machine had been stopped by pressing the button "Positioned Stop" at the operator’s control panel.
- Pull the safety device and lift it up.
- First use the upper aluminium handle, then change to the lower aluminium handle.
- Bring the safety device to the upper end position.
Open the safeguards on the far side of the operator.

- Press the button to open the mechanical lock.

- Pull the handle of the safeguard in horizontal direction.
4.4 Indicators

4.4.1 Electric torch

- Signal if there is a stagnation of products on the exit conveyors. The text of the message must be read from the operating panel, see also under “Trouble Shooting”
- Signal for warning when the tunnel will be started by the automatic start function.
- Green segment lights up, if the main drive is switched on and the machine is running in automation operation
- Green segment flashes, when the main drive in regulator block (stand by) is stopped and can be restarted automatically
- Green segment flashes fast, if service mode is selected.
- The blue segment lights up if a fault message is pending.
- The text of the message must be read from the operating panel, see also “Instructions for Fault Correction”
- The blue segment flashes if an info message is pending.
- The text of the message must be read from the operating panel, see also under “Trouble Shooting”
4.5 Operating equipment

4.5.1 Panel

4.5.1.1 Menu prompting through the operating terminal
4.5.1.2 Basics on operation of the operating terminal

Notes
Always adhere to the guidelines contained in the following safety brochure when following the instructions described in "Safety Fundamentals for Filling Systems of the Beverage Industry".

The purpose of the descriptions contained in operator prompting is to explain how to handle the operator panel (operator terminal) and how to operate your machine. Since the operating facilities of your machine are adapted to your requirements and local operating conditions, slight deviations from the instructions provided here cannot always be avoided.

ATTENTION!
This operator prompting is intended only for orientation purposes and to explain machine functions provided and is not to be used for machine commissioning.

In order to avoid machine malfunctions, the described actions must be performed only by personnel authorized by KHS.
Operating terminal MP377

The KHS-LOGO, respectively, the start page of the machine appears in the display field of the operating terminal after engaging the main switch on the switch cabinet, but no program is selected.

- The operating terminal (screen) serves for machine control and delivers information on the machine state.

The screen-start page appears always after any new start of the machine or when „No program“ has been chosen in the menu „Program selection“. Continue to the production screen page with the function key „Program selection“, see also „Production start“.

The standard input unit at the control unit is the touch screen. After having started the control unit, the touch screen will display all elements necessary for the operation of the machine.

**Unintended actions**
Always touch one only operation element on the display. Do not touch several elements at the same time, otherwise inadvertent actions may be caused.

**Risk of damage of the touch screen**
Contacting the touch screen with pointed or sharp objects, as well as the abrupt touching of same with hard objects, may lead to a considerable reduction of the lifetime of the touch screen, including the risk of a complete failure. Touch the touch screen of the control unit with the finger only or use a special touch pen.
4.5.1.3 Screen keyboard

If the input of signs or characters will become necessary, a screen keyboard will be activated automatically. In such a case input do be carried out via the touch screen – also see description of the manufacturer.
4.5.1.4 Basic Screen Masks

1 XXX-Name
Name of the current screen

2 Program
Name of the selected program

3 Warnings
Actual warning

4 Mode
The operating mode informs about the type and extent of intervention and about the influence of the feedback from the equipment being controlled on the control system of the machine.

Machine state: Off
The machine state is understood as an operating mode- provides information that the machine is not in operation. The machine is in operation when one of the following modes is displayed.

- Automatic
Mode of operation, without operator intervention in the control processes.
Semi-automatic

Mode of operation, in which the controls work only with engagement by the operator dependant on possible locking mechanism.

Manual

Mode of operation, in which the controls or program work as planned without engagement by the operator.
5 Fault
Current fault

6 State
Various operating states can occur with malfunctioning machines
Stopped, Starting, Operating, Aborting Equipment Failure External
Failure, Holding or Held. See description OMAC Statemodel.

7 Cycles:
Current machine speed in [cycles / min]

8 Pos.: Current position of main drive in [$^\circ$]

9 Type:
Current type data

10 Date

11 Time

12 Next Screen / Next Page

13 Stop Used to stop the visualisation runtime

14 Statistic Access to the “Statistic”-menu

15 Legend of Icons

16 Faults and Warnings
Shows the list of current faults and warnings

17 Special Functions
Access to the menu for functions, which are not necessary to keep
machine producing.
18 Function Enable
Access to the menu for activation of single machine functions

19 User Login (in) / (out)
Access to the “Login”-field.
Changes to “in” when “Logout” was successful.

20 Previous Screen /Previous Page
21 Previous function level
4.5.1.5 Start Screen

Start Screen

The “ProgramSelection”-menu is the central starting point for all activities and work on the machine. Important for the PDA (Production Data Acquisition) the operator must use the “ProgramSelection”-menu before starting any activity, function or work on the machine.

The „Start page“ is to be selected, when the machine is not in production mode and no activities or work are executed in the machine.
4.5.1.6 Program Selection

- Actuate the button “Program Selection“

- The menu “Program Selection” will be activated

Menü Program Selection

The “ProgramSelection”-menu is the central starting point for all activities and work on the machine. Important for the PDA (Production Data Acquisition) the operator must used the “ProgramSelection”-menu before starting any activity, function or work on the machine.
Menu

Program Selection

No program
This will be called up during downtimes due to production stops. If so, no program has been chosen – machine cannot be started.

Production
This will be called up for production process. Machine will run in production speed, depending on the type of product and the output capacity.

Production - loading
As for the selection to start the machine, see the operating manual. Start the packer under „Start machine“. The menu „Collating system“ is called up. The function “Loading” is active.

Production - unloading
As for the selection to start the machine, see the operating manual. Stop the packer under „Stop machine“. The menu „Collating system“ is called up. The function “Unloading” is active.

Set-up
This is to be called up, if the machine has to be retooled. The menu “Type Selection“ will be called up. Select a new type, retooling machine, adjusting format values and test of production. If done, change program to “Production”.

Maintenance & service
To be called up if machine has to be maintained. The production picture will be called up. Please keep in mind safety regulations!

Break
To be called up if the machine is not producing due to a pause.

Through-operation
To be called up if machine is not producing, nevertheless, when all products shall pass. All functions will remain deactivated, only transportation of products running. However, this can only be chosen for types which have been arranged for through-operation. Otherwise, an “Error” message will be displayed. The machine has to be set up to comply with the parameters of the passing products.
4.5.1.7 Productions screen

- Actuate the button “Production“
→ The menu “030 Production” will be activated.

The “Production”-menu is the starting menu for all further functions.

1 Machine speed [cycles/min]
Current machine speed in [cycles / min]

2 Position and Signalling Arrows
- red curved arrows, indicating any open safety device
- red mushroom, indicating the positions of the emergency-stop pushbutton which has been operated.
- yellow arrows, indicating the locations of warnings
- red arrows, indicating the locations of faults

3 “Screen selection”
Access to the “Reset Counter”-menu

4 Packs Counter (shift)
Shows the number of products per shift

5 Packs Counter (total)
Shows the total number of packs

6 See previous pages.

7 Screen-related texts or characters of the keys

8 See following pages.
4.5.1.8 Password login /logout

- Press the function key or call up a password protected menu
  → The “Login“ input mask will be activated

- Type on the field “user“; input user name and confirm with OK
- Hit the field “Password“; enter the password and confirm with OK

- Hit function key again
  → Activation will be cancelled
4.5.1.9 Menu „Function enable“

- Hit function key
  ➔ The menu “018 Function enable1” will be called up.

4.5.1.10 Run in

After pressing the key, the feeding conveyor runs directly in front of the machine in order to refill the conveyor with products after lack of product. Pressing the key another time, loading will be terminated.

4.5.1.11 Run out

After "Minimum products", feeding conveyor and collating station can be unloaded.
After pressing the key, feeding conveyor and metering conveyor start running and the product detection is bridged.
Pressing the button "Collating system release" the collating station is released as long as the key is kept pressed that all products can be unloaded from the machine.
Make sure that no tilted products or incomplete product groups are fed.
Pressing the key another time terminates “Unloading”.
4.5.1.12 Collating station release

While keeping pressed the button, the collating station is released.

4.5.1.13 Coding device 1 / 2

Pressing the button, the coding device is switched on, respectively, off.

4.5.1.14 Film end detection by the high-tension voltage

Pressing the button, film end detection by high-tension voltage is switched on, respectively, off.

4.5.1.15 Lamp test

When button will be pushed, all lamps in the control panel, the LED lamps in the operating terminal and the indicator flashlights have to be on. If not, there has been originated a defect of the corresponding component. Same has to be replaced by qualified staff immediately.

4.5.1.16 Key “Tunnel ON”

To switch on the fan and tunnel transport.
The main switch has to be engaged.
The switch „Power Packer“ has to be set to „ON“.
The key „General ON“ has to be actuated.
See also chapter “Operation - production start”.
4.5.1.17  **Key “Tunnel OFF”**

To switch off the tunnel. 
The fans keep on running for cooling. 
See also chapter “Operation - production stop”.

4.5.1.18  **Key „Manual machine lubrication“**

The page „.025 Lubrication“ is called up.

Hitting the key, lubricating is activated. The associated lubricating pump runs until the adjusted pressure on the pressure switch of the lubricating system has been built-up. 
For additional lubrication between the automatic lubricating intervals and test purposes.

**Manual lubrication - oil (machine)**
Actuating the key, lubricating of the chain in the machine is activated.

**Manual lubrication - oil (collating system)**
Actuating the key, lubricating the chain on the collating station is activated.

**Manual lubrication - oil (folding)**
Actuating the key, lubricating of the chain on the folding is activated.

**Manual lubrication - oil (tunnel)**
Actuating the key, lubricating of the chain on the tunnel transport is activated.
4.5.1.19  **Menu „Special functions“**

- Press the function key.
  ➔ The menu „015_SpecialFunctions„ is called up.

4.5.1.20  **Date / time setting**

- Press the function key.
  ➔ The menu "011_SetDateTime" is called up.
4.5.1.21 Drive adjustment

- Press the function key.
  ➔ The menu "120_AutoAdjustment1" is called up.

These functions are described in the chapter „Changeover“.

4.5.1.22 User management

- Press the function key.
  ➔ The menu "User accounts" is called up.

The service engineer presets the different passwords for the user according to his wishes during start-up of the machine. The passwords can be preset in level 4 only. If other passwords or levels are required after start-up, the password can be requested from KHS. To comply with system safety requirements, the user has to treat this password strictly confidential.

4.5.1.23 Calibrate screen
• Press the function key.
→ The menu "Screen setting" is called up.

When actuating the key and no response is seen, then the screen has to be calibrated. For that purpose, touch the crosshairs rectangularly as far as possible on the screen and if possible, precisely in the centre as well.

With the final touch of the crosshairs, calibration is terminated. The screen starts automatically after 30 seconds.

4.5.1.24 Machine Parameters

• Actuate the function key "Machine Parameters".
→ The menu "Machine Parameters" is called up.

All machine parameters can be altered, for example, to setup a new type.

For qualified staff only!
4.5.1.25  Type selection

- Press the function key “Type Selection”
  → The menu "003_TypeSelection" will be displayed.

- Press the function key for the type desired.
  → Display will change to
- Acknowledge with the function key “Accept type”
  → The desired type will be activated.

Parameter display

The display shows the actual status of the functions.

- Film with / without
- Printed film with / without
- Tray edge high / low

Touch the display.
→ The menu "009_TypeSelectionFilmBlank" is called up.

- The function can be changed independently of the format parameter setting.
4.5.1.26 Copying type

- Press the function key “Copying type”. ➞ The menu "010_TypeCopy" will be displayed.

- Details of type may be copied, for example to arrange for a new type.
- Enter data of the actual kind and of the desired kind.
- Afterwards confirm with the function key „Copying kind“.
- The data of the source will be copied into the desired type.

If desired type already exists, data will be overwritten!
4.5.1.27  Machine Conditions / Diagnostic

- Press the function key “Machine Conditions / Diagnostic”
  ➔ The menu "021_MachineConditions" will be displayed.

4.5.1.28  OMAC Statemodel

- Press the function key "OMAC Statemodel"
  ➔ The image “020_Statemodel” will be called up.

- The picture displays possible conditions of the machine.
4.5.1.29 **Signals loose product**

- Actuate the function key "Signals loose product".

→ The page “080_Signals_looseProduct” is called up.

- The page delivers information on the status of the control of the product feeding mechanism.

**For qualified staff only!**

- the condition is met

### % indicates the velocity of the metering conveyor in [%] related to the machine speed.
4.5.1.30 **Signals Packs conventional**

- Actuate the function key "Signals Packs conventional"
  
  The page “081_Signals_PacksConv”- is called up.

- The page delivers information on the status of the control of the product feeding mechanism

  **For qualified staff only!**

  - The condition is met.

  ### % indicates the velocity of the metering conveyor in [%] related to the machine speed.
4.5.1.31 Diagnostics adjustment

- Actuate the function key "DiagnosticsAdjustment".
The page “121_Adjustment1” is called up.

In case of failures of modules, switch on and off the voltage of the Profibus-path for diagnostic purpose. After that the bus informs about the missing module.

4.5.1.32 Diagnostics adjustment tunnel

- Actuate the function key "DiagnosticsAdjustmentTunnel".
The page “038” is called up.

The Baumer-make servomotors can be diagnosed here via the Gateway-interface.
4.5.1.33  PPC Diagnose

- Press function key “PPC Diagnostic”.
  ➔ The menu "100_ PPC Diagnostic" will be displayed.

- The picture displays the status messages and other details of the servo axis
  
  For qualified staff only!

4.5.1.34  Dancer position

- The actual position of the film dancer is indicated.
  
  For qualified staff only!
4.5.1.35  Servodrives

- Actuate the function key “Servodrives”.
  ➔ The menu "091_ServoDrives" is called up.

### Jog mode
This function is enabled in the programs Adjustment / Maintenance/ Setting-up and with connected portable control panel only!
The selected axis can be separately traversed with the jog key.
- Select the drive / axis in the pop-up window.
- Actuate the key "Jog mode" – the function "Jog mode" is activated and the display is black highlighted. The selected axis can be separately traversed with the jog key.

### Brake release
The brakes of the servomotors are released, for example, for setting the reference position or repair.
- Activate with ▼ selection key.
- Select the drive / axis in the pop-up window.
- Acknowledge selection with ENTER.
- Release the brake of the drive.

### Reference position check
- The reference position is the datum for the control of the drive motors.
  See chapter "Basic adjustment".
4.5.1.36 Language Selection

- Press function key “Language Selection”
- If several languages have been provided, user can change to the second one by pressing this pushbutton

4.5.1.37 Cleaning the screen

- Activate function key "Clean Screen"

The display screen has to be cleaned at regular intervals. Use a moist cloth for this. For this procedure the “Clean Display” key has to be pressed. This will guarantee that no unintended functions will be released when touching the screen. Use only water or a special monitor foaming detergent for moistening the cleaning rag,
- Never spread the detergent directly onto the screen, but first onto the rag.
- Never use any aggressive dissolvent or scrubbing cleansers.
4.5.1.38 Actual Messages

- Press the function key
  → The figure “997_MessagesActual” will be called up.
4.5.1.39 Help

- Press the function key `Æ`
  ➔ The help menu “900_Help” will be called up.

User Help for the correspondence between the symbols and the different functions and menus.

- Press the key “>>”
  ➔ The help menu “901_Help2” will be called up.
4.5.1.40 Statistics

- Press the function key Æ
  → The menu "060_Statistic" will be called up.

4.5.1.41 Pack counter

- Press the function key “Pack Counter”
  → The menu “063.CounterReset” will be called up.

- Touch the screen button Ñ
- The display will change to ✓; counter has been reset
4.5.1.42 History Alarm / Warnings

- Actuate the function key “Fault retrieval” or “Warning retrieval”
  → The page “999 FaultHistory” is called up.
4.5.1.43 Tunnel

- Actuate the function key "Tunnel".
  - The page “036_Tunnel” is called up.

Actuate the function key „Next page“.
  - The menu "037_Tunnel_Belimo" is called up.

Allocation of the servomotors to the single air nozzles.
Indication of the throttle position in %.
4.5.1.44 Machine synchronisation

- Actuate the function key “Machine synchronisation”
  → The menu “034_MachineSynchronisation” is called up.

  - All products have to be unloaded from the machine and the main switch engaged.
  - Switch on the power supply with the selector switch „POWER PACKER ON / OFF”.
  - Actuate the key „GENERAL ON”

- Actuate the key ✖ for the drive unit of the machine, which is to be synchronised and keep the key pressed.

- Key ✖ changes over to ✔.

**Carton transport**
Key for synchronisation of the drive of the collating system after the message "Collating system synchronous", see chapter "Fault elimination".

**Collating system**
Key for synchronisation of the drive of the collating system after the message "Collating system synchronous", see chapter "Fault elimination".

**Upper pushbar chain**
Key for synchronisation of the main drive after the message "Main drive not synchronous", see chapter "Fault elimination".

**Film cut**
Key for synchronisation of the drive of the film cutting station after the message "Film cut not synchronous", see chapter "Fault elimination".

**Film collating**
Key for synchronisation of the drive of the film collating after the message "Film collating not synchronous", see chapter "Fault elimination".

**Brake release**
To deactivate the brakes of all the servodrives, for example, for fault elimination. As for releasing the brake of single drives, see the menu „Servodrives“.
4.5.1.45 Control panel

Emergency-stop button
- Shuts down machine in the event of an emergency.

PRE-START ON
- Activate this button to start the feed conveyor. The illuminated button lights up. The machine is set to preparation mode. Operate "PRE-START ON" button prior to operate "MAIN DRIVE ON" button. The button blinks when
  - one of the safeguards is open,
  - one of the emergency stop button has been pressed, and
  - after the main disconnect is switched on.

POWER PACKER ON/OFF
- Turn anticlockwise: Packing unit can be switched on.
- Turn clockwise: Packing unit cannot be switched on.
The tunnel remains switched on.

IMMEDIATE STOP
The speed of the main drive motor is first decreased before the motor is stopped. Emergency: This is not a positioned stop.

CYCLE STOP
Switches off the machine in POSITIONED STOP condition. I.e. the machine stops at a defined position. The machine speed slows down to the “lowest” speed and then the machine stops.
Operating Devices at the Feed conveyor
Switch to the left and hold it: Feed conveyor starts.
Switch to the right: Feed band and collating system start after a product minimum or a fallen product on the feed band

FAULT RESET
Blinks to show that the machine is switched off by any fault. Cancel the fault message. Provided the signalled fault has been rectified.

MAIN DRIVE ON
Starts the main drive and the feed band motors. Provided the button “PRE-START ON” is first operated, the button lights up and no faults are indicated on the monitor screen.

COLLATING SYSTEM DISABLED / ENABLED
- Switch to the left: The collating system is shut-off.
- Switch to the right: The collating system is freed.

SPEED LOW / AUTOMATIC
- Switch to the left: The lowest speed is switched in.
- Switch to the right: Machine speed is regulated automatically.
4.5.2 Controls

4.5.2.1 Formatting/film cutting station

**MAIN DRIVE ON**
Starts the main drive and the feed band motors. Provided the button “PRE-START ON” is first operated, the button lights up and no faults are indicated on the monitor screen.

**FAULT RESET**
Blinks to show that the machine is switched off by any fault. Cancel the fault message. Provided the signalled fault has been rectified.

**CYCLE STOP**
Switches off the machine in POSITIONED STOP condition. I.e. the machine stops at a defined position. The machine speed slows down to the “lowest” speed and then the machine stops.
4.5.2.2 Film cutting station

Allows the film feed and film cycle to be run although there is no product present in the wrapping section and the push button “POWER FILM MANUAL” has been pressed.

Releases film feed clutch to allow feed rollers to be turned by hand when threading film. The dancer moves to the lower position.

Has to be pressed before the push button “MANUAL FILM” can be used.

- Lights up when the film welding bar is closed in order to weld the film ends after a film reel change.
- Extinguishes when the welding process is finished and the cooling time is started.
- Blinks to show that the cooling time is finished.
- Open film welding bar.
4.5.2.3 Film collating

Emergency-stop button
- Shuts down machine in the event of an emergency.

Can be actuated, when “Film end 1 / 2” is displayed.
See also fault codes “F1163 / F1164 film end film 1 / 2”.

Pressing the Key **Print advance/retract**, the position of the print image can be corrected during production.

- **Print image advance:**
  The print image on the product group advances.

- **Print image retract:**
  The print image on the product group retracts.

- Switching to the left: The expansion and control of the left-hand film mandrel is switched on.
- Switching to the right: The expansion and control of the right-hand film mandrel is switched on.

Positioned OFF

Switches off the machine “In Position”.
The machine speed is slowed down “minimum” speed and the machine stops at a defined position.
4.6 Establishing readiness for operation

Switching-on the machine

- Engage the main switch-on the switch cabinet, approximately 30 minutes before start of work. Switch-on the shrinking tunnel and hot-setting gluing device (see the separate description for the hot-setting gluing device).

Switch-on the compressed air supply.

- Turn the valve on the compressed air maintenance unit to position „Open“.

Correct format setting for the actual format adjusted (see chapter "Changeover", respectively, "Table of format setting parameters").
4.7 Production

4.7.1 Generals

In this chapter, the operation of the machine before/during and after production is described.

4.7.2 Safety instructions

Observe the safety regulations in the operating manual.

If the machine does not seem to be able operating without causing danger, then put the machine out of operation and secure from unintentional operation! Dangerless operation is not possible anymore when:

- the packing machine has visible damage, and
- the machine does not work properly anymore.

4.7.3 Prerequisites for production

Prerequisites for production are:

- The packing machine is in faultless state.
- Heating up the tunnel approximately 30 minutes before start of production.
- Selection of the format to be produced in the control panel.
- The adjustments required for the desired format have been made.
4.7.4 Production preparation

4.7.4.1 Check of the machine

Check of the blank magazine
- Sufficient number of blanks available?
- Guides set to blank size?
- Blank quality (size, corrugation, etc.)

Check of the feeding conveyor
- Sufficient products available?
- No products tilted?

Check of the film station
- Sufficient film stock
- Film correctly threaded up
- Proper film reel selected

Check of the hot-setting gluing device
See also the instructions in the handbook of the hot-setting gluing device.
- Sufficient glue?
- Glue is fluid?
- Gluing heads working properly?

- Safeguards closed?
- Emergency stop button unlocked?
- Proper speed selected?
- Rated temperature in the tunnel and hot-setting gluing device reached?
- (See the instructions hot-setting gluing device).
4.7.4.2 Tunnel start

Engage the main switch.
- Control voltage is applied.

Check, if the selector switch „Power Packer ON / OFF” has been set to „ON”.

Operate the button "PRE-START ON". The button lights up.

Change to the menu "TUNNEL".
The tunnel can be switched-on either by hand or automatic switching-on procedure. Make sure that at first the tunnel heats after switching-on. Thus, production cannot be directly start after manual switching-on of the tunnel, since the warming-up phase has to be finished first.

With automatic switching-on, a defined time is specified before start of the warming-up phase. The time can be chosen that the tunnel has already been heated up at the planned start of production.

Actuate the key "Switch-on tunnel”.
- The tunnel transport runs.
- The blowers run.

Actuate the key "Demand: With heater”.
- The tunnel is under heating.

- When a temperature of 25° (factory setting) below the set shrinking temperature has been reached, then the upstream peripherals (packer) are released.
- The info message "Lower temperature of the heating zones on the tunnel” extinguishes.

Actuate the key „Previous page” in order to return to the menu „Production”. 
4.7.4.3 Selection of the automatic switching-on procedure

Change over to the menu “Tunnel”.

- Actuate the key “Automatic switching-on” to be set to “1”.
- Actuate the key “Back” to return to the info-page.

In order to enable the tunnel to be started with the automatic switching-on procedure, the main switch has to be engaged and “General ON” activated at the programmed start of readiness for switching-on.

The tunnel starts at the entered time.
- The tunnel transport runs.
- The blowers run.
- The tunnel is under heating.

When a temperature of 25° (factory setting) below the set shrinking temperature has been reached, then the upstream peripherals (packer) are released. The info message “Lower temperature of the heating zones on the tunnel” extinguishes.
4.7.4.4 Setting of the automatic switching-on procedure

Change to the menu "Machine Parameters" with button .

Change to the menu "Parameters Shrink Tunnel".

The menu “Module shrinking” appears on the screen.

- Touch the input box for the line “L01”.
- The keyboard appears on the screen.
- Enter the desired switching-on time (for entering the colon, changeover with the key ).
- Confirm with .

- Actuate the function key .
- The box “Data saved” lights up green.
- The desired switching-on time is stored.
4.7.4.5 Controls for the cleaning station for the transport chain

For cleaning the conveyor belt from firmly adhering film residues, labels and the like, a cleaning system has been attached. Firmly adhering film residues are difficult to be removed from the conveyor belt. In order not to affect the shrinking result, activate the cleaning system already with the first signs of contamination, see also „Maintenance“.

Change over to the menu “Tunnel”.

Selector switch „Cleaning Chain Conveyor Automatic“
- Switches the automatic chain cleaning function ON/OFF.
- With activated cleaning, the rotating cleaning brush is automatically approached to contact to the conveyor belt in preset cycles.
- The chain cleaning must be deactivated only in case of production without film.
- See also „Maintenance“

Key „Cleaning Chain Conveyor Manually“
- Activates chain cleaning independently of the preset switching-on cycles of the automatic chain cleaning function.
- After a preset time interval has elapsed, the cleaning brush returns automatically.
4.7.5 Production start

Ensure that the selection key switch "POWER PACKER ON/OFF" is set to the position "ON".

Operate the button "PRE-START ON". The button lights up.

Set the selector switch "COLLATING SYSTEM DISABLED / ENABLED" to "DISABLED"

Operate the button "MAIN DRIVE ON".

The menu “Start” appears on the screen.
- Actuate the key „Program selection“.
Actuate the key „Production - loading“, when
- no products are standing on the upstream belts, and
- no products are in the collating station.
- Incomplete packs have been removed from the collating station.

The menu “FunctionsEnable1” appears on the screen.
- The key „Loading“ is selected.

When the upstream belts have been filled up to the collating station, deactivate the key „Loading“.

Actuate the key „Single release collating system“.  
- The collating system starts and is stopped again.  
- The collating system is filled with products.

Actuate the key „Previous page“ in order to return to the menu „Production“.

The menu “Production” appears on the screen.

Actuate the key „Program selection“.
Select the program according to the planned operation (see program selection). For example:
Key „Production“, when
  • there are products on the upstream belts,
  • there are products in the collating station and production can start.

Actuate the key „Previous page“, in order to return to the menu „Production“.

The menu “Production” appears on the screen.

• When a temperature of 25° (factory setting) below the set shrinking temperature has been reached, then the upstream peripherals (packer) are released.
• The info message ”Lower temperature of the heating zones on the tunnel“ extinguishes.

Set selector switch "COLLATING SYSTEM DISABLED / ENABLED" to "ENABLED".
- Tray blanks are extracted and the collating system is started. The machine starts production.
4.7.6 Production control

Generals
It is the operator’s task to keep the machine operating while in production.
The operator is recommended to dispose of sufficient consumables.
Consumables are:
- Blanks
- Glue
- Film reels.

4.7.6.1 Minimum quantity of blanks

The operator has to ensure that there are always sufficient blanks available in the magazine.
A light scanner monitors the minimum quantity of blanks in the magazine. The blank separator stops immediately, when the minimum quantity is exceeded. The blank separator starts automatically, when there are sufficient blanks available in the magazine.

Loading the blank magazine:
Place the printed side of the blank to be positioned opposite to the running direction in the machine.
Place the blank stack between the guides.
The long side to print downwards on the blank magazine.
Locate the pressing-on unit behind the blank stack.
4.7.6.2 Minimum glue

ATTENTION: Do not put hands into tank - danger of burns!!

Observe the safety instructions in the chapter “Safety” and manufacturer’s instructions of the hot-setting gluing device.

Red blinking information related location in the graphical representation of the machine on the operator’s control panel - Hot-Melt Adhesive Unit. Blue segment of the pillar signal lamp blinks. Hot-melt adhesive tank is almost empty.
- Fill up the tank up to 2 cm below the top of the tank.
- Fill the hot-melt adhesive tank step by step. Always fill in small amounts of hot-melt granulate and wait until the granulate is molten.
4.7.6.3 Film threading-up

With production start or when the film has been pulled out of the film system, re-thread up the film.

Change over the selector switch „Collating system disabled / enabled” to „disabled”.

Switch-off the main drive by setting to "Positioned OFF".

- Empty the product and carton transport conveyors.

- Set the selector switch "FILM REEL CHANGEOVER" to the not active film reel.

Actuate the key “Film manually threading-up”. Switches off the film transport clutch, the dancer moves downwards in order to enable threading up the film through the dancer and film transport reels. Service mode has to be selected and the plug on the yellow key housing put in.
• Insert the film according to film guiding scheme via reversing rollers and thread-up the film through the dancer.

For easy threading-up, twist the film to make up a "rope". Bevel the film to get it pointed on the operator side. Place the film tip between the lower film transport rollers and rotate the transport rollers by hand in transport direction until the film has been drawn in.

*Do not pull the film into the area of the film cutting knife, but only thread-up just to stop before the lower film transport rollers. Do not put your hands into the area of the cutting knife!* 

Unlock and lower the film retainer to the conveyor belt that the film does not reach into the transport area.

Set the selector switch "FILM REEL CHANGEOVER" to the active film reel.

Actuate the key „Main drive ON” on the control panel, or actuate the key „Main drive ON” on the small control panel of the film station.
Actuate several times the key "START FILM CYCLE" to assure that the film is correctly positioned in the transport system.

Remove film bits from the retainer and swing up the device until it latches.

Check the position of the film on the conveyor belt.

Close the protective doors and safeguards. Start the machine and peripherals.
4.7.6.4 Film reel change

Red flashing fault location in the machine graphics for film reels. Film end almost reached. The machine speed slows down. The machine does not stop. The blue segment of the electric multi-segment torch flashes.

Press the key "ACKNOWLEDGE FILM END" and
• the machine starts:

The operator has to stop the machine with the key “Positioned OFF”, when the end of the film has almost been reached. Change the film reels.

Leave always a small rest on the film reel in order to avoid re-threading up of the film.

For rolling-off the film reel 1, the selector switch "FILM REEL CHANGEOVER" has to be set to the position of the film reel 2 and visa-versa.

Pull the film tip of the new reel up to the film welding unit.

Set the selector switch "FILM REEL CHANGEOVER" to the position of the new film reel.

Roll-off the empty film reel until the dancer reaches its bottommost position in order to avoid that the film is pulled into the dancer after cutting off.

• Cut-off the film that the cut-off end yet reaches beyond the film welding unit.
• Insert the end of the cut-off film and the tip of the new film into the welding unit.
• Press down and hold the welding bar.
Adjust the welding time in the menu „Operation“ on the operator panel.

When the yellow pilot lamp extinguishes, the welding time has elapsed. Keep the welding bar closed and pull off the film rest from the welding unit.

In case of films with printing images, weld the film in the not printed area.

If possible, match the printing images to each other that there is little need for the printing mark control only to correct, and no printing mark error arises.

Restart the production flow.
- Actuate the key „Main drive ON“ on the control panel.
4.7.6.5 Film printing mark positioning

When in the operating mode „Printed films“ the error message „FILM PRINTING MARK NOT CORRECT“ is output, then adjust the film printing mark. The position of the film printing mark may change after film reel change or due to fault in the film guide.

If available, swing down the film retainer.

Actuate the key „Main drive ON“ on the control panel.

• or

actuate the key „Main drive ON“ on the small control panel of the film station.

Actuate the key „Pull film manually“ over the duration of 5-10 machine cycles.
• The film cut references automatically to the printing mark.

Actuate the key "POSITIONED OFF"
• Remove the cut film and if available, swing up the film retainer.
• Check the film position on the film conveyor belt.
• Start the machine and after passage of some products, check the position of the printing images on the product group after leaving the shrinking tunnel.
• With bigger deviations, re-position.

By means of the keys "**Printing image Advance/Back**" correct the position of the printing image during production.

- **Printing image advance:**
  The printing image on the product group advances.
- **Printing image back:**
  The printing image on the product group moves back.

- The function manipulates the value of the parameter K12.
- Every time the key is pressed, the printing image on the package slowly advances or moves back.

- The correcting range of the printing image shift is limited. The function must not replace the precise adjustment via the parameter K12, but is recommended to be used for temporary correction.

After disengaging the main switch, the parameter K12 is reset to the value, which has been stored in the format parameters.
4.7.7 Production stop

The machine produces.

Changeover the selector switch „Collating system disabled / enabled“ to „disabled“.

When there is no pack in the machine:

Actuate the key "POSITIONED OFF".
  • The packer stops in defined position,

or

actuate the key "POSITIONED OFF".
  • The packer stops in undefined position.
4.7.8 Production continuation

Actuate the key „Main drive ON“ on the control panel.
  - The packer starts.

Changeover the selector switch „Collating system disabled / enabled“ to „enabled“.
  - The packer starts producing.
4.7.9 Production termination

4.7.9.1 Packer switching-off

The machine produces.

Changeover the selector switch „Collating system disabled / enabled“ to „disabled“.

When there are no packs in the machine:

Actuate the key "POSITIONED OFF".
- The packer stops in defined position,

or

actuate the key "POSITIONED OFF".
- The packer stops in undefined position.

Set the selector switch „Power Packer ON / OFF“ to „OFF“.

Compressed air switching-off
- Set the valve on the compressed air maintenance unit to position „Closed“.
4.7.9.2 Tunnel switching-off

Never disengage the main switch-on the switch cabinet as long as the tunnel is heated.
Before switching-off, let the tunnel keep on running to cool down, in every case!

Change over to the menu “Tunnel”.

Actuate the key „Tunnel switching-off“
- The tunnel heater is immediately switched off.
- The conveyor belt automatically stops and the blowers are switched-off as soon as the temperature has reached the set value (factory setting 80°C).

After cooling down of the shrinking tunnel, the machine and peripherals can be shut-off with the main switch-on the switch cabinet.
4.8 Change of the mode of operation Automatic / Jog

Only KHS-personnel or persons authorised by KHS are allowed to use the setting-up mode!

Actuate the key „Program selection“.

Function is available in the programs „Setting-up“ / „Maintenance“ / “Break“ only and with connected portable control panel!

Connect the portable control panel to the socket on the control panel.

Actuate the key „Main drive ON“ on the control panel.
- The packer starts by actuating the respective key on the portable control unit.

The machine traverses with preselected speed as long as the key is kept pressed and can be started as well as stopped in any desired position without subsequent fault.
4.9 Cleaning

See chapter „Maintenance“.
4.10 Changeover

4.10.1 Generals

After changing the type, the first pack, which has passed through the machine, has to be checked. The pack must be properly welded and comply with all the demands for stability and shape. Check the packs during production on a regular basis.

The factory settings of the single formats serve for basic orientation only. The final setting is to be taken during start-up on-site under consideration of the actual production conditions.
4.10.1.1 Generals on adjustments and format parts

- Pull the lever handwheel with both hands in direction of the axis to release the locking.
- Turn the lever handwheel until the format-dependent number is indicated in the counter behind the handles. If necessary, override (observe the direction arrows).
- Observe the direction of rotation and alteration of the counter indication.
- Get the lever handwheel engaged by slightly pressing and moving a little bit.

In the bus module of the adjustment, the direction of rotation of the screw is displayed. In order to compensate the mechanical backlash, rotate the screw by half turn beyond that indicated rated value. Then turn back until the actual value coincides with the rated one.

After reaching the desired position, the module automatically acknowledges the position. On the control panel the colour of the display of this changeover points jumps from yellow to green.

If this so-called overriding did not do or was not effective at all, then the LED display on the adjusting assembly keeps on flashing red and the display on the control panel stays yellow.

Since the locking positions do not always coincide with the rated value, precise adjustment is not possible. Thus adjust that value, which is as accurate as possible the module can accept.

When no alteration of the screw position is detected, but the actual value floats within the tolerance bandwidth, then the real position is considered to be adjusted to coincide with the rated one.
At this changeover point, the operator has to adjust the mechanical part to the rated position, item 5 (for example, mm on the measuring-tape scale as setting aid on the feeding conveyor). The lower value refers to the real position, item 6.

After adjustment of the changeover point, the operator confirms with the star key.

On the control panel, the colour of the display of this changeover point jumps from yellow to green.
Accu Drive (accumulator handheld drilling machine)

By means of the Accu Drive the screw adjustment can be automatically set to the rated value. The direction of rotation and speed of the Accu Drive are executed without the operator to intervene. The Accu Drive is controlled via the integrated infrared sender. Overriding is also automatically executed.

After reaching the position, the LED changes to green and the digital display is calibrated. After the LED has changed to green, the operator is to release the button of the accumulator driven screwdriver that this hand-held tool will not be re-started by interfering signals of the adjacent interface activated next, and the just finished adjustment gets changed anew!

The flashing LEDs indicate, which one of the adjustments has to be set anew with the Accu Drive.
Measuring tapes  Marks, ends and surface areas on the guide rails as well as brackets serve as pointers for the measuring tapes. The format-dependent numbers can be learned from the format list.

Adjusting aids  Setscrews in the aluminium profiles determine the format-dependent distance of the guide rails. The screwheads have to latch into the boreholes of the guide rail brackets.
Some parts or set of parts have to be replaced for defined format changes. The adapters are marked according to format and have to be assembled for the respective formats. Those adapters, which are not needed for the actual format, have to be carefully stored.

Identification labels

Labels on format adapters inform about the format, which the parts are used for.

Colour marks

Colour marks attached to some adjustment units and adapters point to the format. The assignment of colours to formats can be learned from the format list.

Number marks

Number marks attached to some adjustment units and adapters point to the format. The assignment of colours to formats can be learned from the format list.
Labelling of the adjustment units

Each adjustment unit, which has to be set-up for format change, features a label consisting of a combination of letters and numbers. The **first section of the label** designates the module of the machine, where the respective adjustment unit is located.

M1 = Product feeding conveyor belt
M2 = Collating system and overhead pushbar chain I
M3 = Folding/gluing station and overhead pushbar chain II
M4 = Film transport and film collating mechanisms
M7 = Shrinking tunnel
M9 = Blank magazine and blank feeding mechanism
M11 = Synchronising switch (laner)

The **second section of the label** designates the single adjusting points within a module. The numbering does not necessarily coincide with the adjusting order. In some areas of the machine, the adjusting order is decisive to avoid collision and resulting damage. In such case, observe the instructions given in the relevant sections of the format-changeover instruction manual.

The letters “A” and “B” on the end of labelling apply if the respective adjustment units are used on both sides of the machine:
A = Operator side
B = Far side to the operator place

The format list contains the setting values of all the adjustment units such as, for example, handwheels and measuring tapes for all formats. The labelling makes it easy to associate the setting values with the respective adjustment unit. The labels are, of course, used in this manual as well, when the setting of the single adjustment units is explained.

Format list / table of values

The format list delivers the setting values of all the adjustment units such as, for example, handwheels and measuring tapes for all formats. It may happen that single values have to be re-adjusted after a longer operating period of the machine or new values have been added, which is particularly true for setting-up new formats. In such case, enter the new values into the format list.
4.10.1.2 Basic positions for adjustment

- Actuate the function key.
  - The menu "AutoAdjustment1" is called-up.

  Setting the address of the bus modules

- Item 1: Select the adjusting module.
- Switch-off Auto Scan.
- Select „Set address“ and confirm on the associated module with key (item 2), respectively, by rotating the manual adjusting mechanism (one turn).
• When a new module is added or has to be re-addressed, then switch-on and off the voltage supply of the gateway in order to teach-in the new module on the gateway.

• Switch-on Auto Scan.

Address indication

• Addresses are indicated in each module.
• Item3: Entered address
• Item4: Real address

Referencing the adjusting mechanisms

• Select the adjusting mechanism.
• Set the mechanical reference position.

The reference value has been stored in the program and engraved on the reference marks.

• Actuate the key „Set reference position“.
• Confirm „Set reference position“.
4.10.2 Safety instructions

- Read and observe the safety instructions of the operating manual, chapter 1.
- Comply with the local safety regulations.
- Before machine start and after type changeover:
  - Inspect that all necessary working steps were finished.
  - The authorised personnel have to safeguard all keys.
  - Before start of the machine make sure that nobody is working in and around the machine.
  - Only that person is allowed to start-up the machine, who is responsible for type changeover.

4.10.3 Prerequisites for changeover

Before type changeover, take the following working steps:

- Unload the products from the upstream belts, see chapter “Operation - unloading”.
- Actuate the pushbutton “Positioned OFF” on the control panel to stop the machine.
4.10.4 Changeover of the machine

In this chapter, the actions to be taken for changeover on the control panel and in the machine are described. The various adjustments of the machine are explained as they have to be executed on the control panel.

Actuate the key „Program selection”.

- The menu „ProgramSelection” appears on the screen.

Actuate the key „Setting-up”.

The page „129_TypeChange” is called-up.
Actuate „Start type change“ and then activate
• „Type selection“.

Colour messages
Yellow: Yet to be executed
Green: Executed

Actuate the key „Type selection“.
Actuate the function key  for the desired type.  
→ The indication in the key changes to .
Actuate the function key “Accept type”.  
→ The desired format is active.

Actuate the key „Previous page”.  

Actuate the key „Manual adjustment units”.  

The page „130_ManualAdjustment” is called-up.

Select the section to be changed over (with several sections to be changed over, set-up one after the other.)
The frame around the key indicates that section, which is to be changed over next.

Colour messages
Yellow: Yet to be executed
Green: Executed

Example:
Actuate the key „Blank feed”.
The page „139_Blank Section“ is called-up.

Colour messages
Yellow: Yet to be executed
Green: Executed

The order to be followed for adjustments is specified. The symbol of that unit to be adjusted flashes in the respective module. Pressing the info key, the help function indicating the changeover steps is faded in. Adjust manually the respective changeover points and, if required, confirm on the module.

Actuate the key „Previous page”
or
actuate the key „Next page” to take the necessary steps for the next section.
All the sections of the machine have to be changed over. These pages assist the operator for change of the various adjustments.

When all the changeover points have been altered, respectively, acknowledged, the sections are highlighted green.

Actuate the key „Previous page”.

The page „129_TypeChange” is called-up.

Actuate the key „Machine synchronisation”

The page „034_MachineSynchronisation” is called-up.
- Actuate the key for the drive unit of the machine to be synchronised and keep the key pressed.
- The colour of the key „Function OFF” changes to green.

Actuate the key „Previous page”

Selection ”Jog mode”  The machine can be traversed in Jog-mode, in order to, for example, get better access to machine modules.

Select Jog-mode.
See also “Change of the mode of operation Automatic / Jog-mode”.

Jog-mode is possible only, when:
- All the safety functions are operative,
- the power supply of the machine is switched-on, and
- no error is output.

For starting the machine in service mode, switch-on the compressed air supply (operating pressure 6 bar). The safety devices have to be closed.

- Actuate the key ”Main drive ON” on the control panel.
- Locate the yellow key housing close the part of the machine to be checked.
- Actuate the key ”Jog-mode” on the yellow key housing until reaching the desired position of the machine.
4.10.5 M1 Product feed

4.10.5.1 M1-1 Adjustment for incorrect product on feed band

In the bus module (item 1), the number of lanes under the detection module used for the particular job is indicated (item 2).

Check / setting:
The detecting levers contact the products ❸ in their centre in horizontal position.
The free swivel range both ways amounts to ± 45°.

Swing up and lock with knurled screw the not required lanes.
4.10.5.2  M1-2 Infeed band guide rail adjustment

- Use the format-dependent adjusting aid.
- Displace the adjusting aid ② of the modules in direction of the locking levers ①.
- Loosen the 2 locking levers ① for each sheet-metal.
- Select the format-dependent pins ③ through rotating the aluminium rail ④. (The format labels are attached to the operator side).

- Align the guiding sheet-metal ⑤ on the format-dependent guiding pins ③ of the adjusting aid.
- Tighten all the locking levers.
- Reset the adjusting aid.
4.10.6 M9 Blank magazine

4.10.6.1 M9-5B Setting of the guide rails of the blank transport

- Adapt the guide rails to the blank width.
- Set the width of the planned format by the lever handwheel (opposite to the operator side).
4.10.6.2  M9-6 Adjustment of lateral guide rails in tray blank magazine

- Adjust the lateral guide rails to the blank width.
- Set the width of the planned format by the lever handwheel.
4.10.6.3  M9-7 Height adjustment of blank support

- Adapt the tray stop to the tray height to be able pulling out the trays with little force only.
- Set the tray stop to the planned format with the lever handwheel.
4.10.7 M2 Collating station

4.10.7.1 M2-1 Disassemble collating pins

Important: Collating system <M2-1> - <M2-10>
If not specified otherwise in the relevant sections, take the single adjustments in the collating system in the order of their numbering. Thus, start with <M2-1> followed by all the other adjustments until the adjustments in the collating station are terminated with <M2-10>.

The axes of the collating systems can be traversed into position in two different modes:

- "Manual" with the function „Brake release“ (see M2-1 “Manually dismantling the collating tools).
- "Automatic", see the following description.

For production of the actual formats, several sets of collating segments are necessary, which have to be interchanged depending on the format.

The collating segments of a format set are labelled with colour codes and specified accordingly in the format list.

Illustration may vary according to actual version.

Changing the collating rails:

- With the machine at standstill only.
- Lock against unintentional switching-on.
- Improper assembly may cause damage in the machine!
The operator can automatically traverse the axes of the collating station under the transport level.

Actuate the start key to call up the page „152_CollatingChangeOver“.

Actuate the key „Move collating pins below transport level“ to traverse the axes of the collating systems under the transport level.

- Change the collating segments.

Actuate the key „Previous page”.

The page „132_formatting” is called-up.

When the operator has changed the collating segments, then the other changeover steps can be taken.
Synchronise the collating system only after all required format parts have been built in, respectively, adjusted, otherwise synchronising may lead to damage of machine parts.
4.10.7.2 M2-1 Manually disassemble collating pins

Important: Collating system <M2-1> - <M2-10>
If not specified otherwise in the relevant sections, take the single adjustments in the collating system in the order of their numbering. Thus, start with <M2-1> followed by all the other adjustments until the adjustments in the collating station are terminated with <M2-10>.

For production of the actual formats, several sets of collating segments are necessary, which have to be interchanged depending on the format.

The collating segments of a format set are labelled with colour codes and specified accordingly in the format list.

Illustration may vary according to actual version.

Changing the collating rails:
- With the machine at standstill only.
- Lock against unintentional switching-on.
- Improper assembly may cause damage in the machine!
- Change over to the menu "Special functions" with function key
- Select the menu „Servodrives“.
- Select "Axes“ (axes 41, 42, 43, 44).
- Actuate the key “Brake release”

Now the drive units can be traversed by hand.
Collating rail dismantling

Revolve the axes 4 and 5 in alternating manner in production direction by hand until the collating segments one after the other have reached their dismantling / mounting position X to be removed there. For that purpose, attach the supplied lever on the tool fitting point.

Dismount all the collating segments.
4.10.7.3  M2-2 Disassemble guide rails between the conveyor chains

The guiding sheet-metals between the product transport chains have to be exchanged, respectively, rearranged with defined format changes. For that purpose, pull the guiding sheet-metals contrarily to the production direction and lift them off, then. To facilitate this job, at first remove the pushbars in that area.

Dismantling the pushbars:
- Extract the black indexing pin. The locking of the pushbar is released.
- Shift the pushbar in direction to „the far side of the operator“.
- Take out the pushbar.

- Pull the guiding sheet-metals contrarily to the production direction from the support and take it out to top, then.

Warning
When assembling, respectively, attaching as well as positioning the guiding sheet-metals, make sure, in every case, that they are not bent.
4.10.7.4  M2-5 Chain adjustment underneath upper flight bars

- Before setting, disassemble the guiding sheet-metals between the transport chains and collating tools!
- Adjust the gaps between the transport chains for the planned format with the lever handwheel, see the format list.
4.10.7.5  M2-7 adjustment of guide rails above collating unit

- Before setting, disassemble the guiding sheet-metals between the transport chains and collating tools!

If the inner and outer segments are separately adjusted, stick to the order of adjustment:
- From "Big" to "Small":  
  At first, adjust the inner lanes.
- From "Small" to "Big":  
  At first, adjust the outer lanes.
4.10.7.6  M2-9 Assemble collating pins

- Mount the format-dependent collating tools. Proceed as described under "Dismantling".
- Make sure that the colour-coded labels are located on the operator side.

**Warning:**
**After changing the collating rails, remove the attached lever from the concerned axis.**

- Synchronise the collating system before start of the machine.

4.10.7.7  M2-10 Assemble guide rails between the conveyor chains

The rails

- remain dismantled, when '0' is indicated in the bus module.
- are assembled, when '1' is indicated in the bus module.

- Insert the rails in supports made from synthetic material and lock them in running direction.
- Mount the bars of the overhead pushbar chain.
4.10.7.8 M2-12 to M2-16 adjustment of guide rails upper flight bars

- Loosen the locking levers.

- Shift the lateral guides to the format-dependent position (stop / mark / scale value).

Tighten all the locking levers.
4.10.7.9 TPFO ON/OFF

- Loosen slightly the lock screws ①.
- Turn the adjusting mechanism to touch the format-dependent stop ②.
- Tighten the lock screws ①.
4.10.8 M3 Folding and gluing stations

4.10.8.1 M3-22 adjustment of product width in folding / glueing section

M3-22 Adjustment to the product width

- Set the adjusting mechanism on the lever handwheel to the format-dependent value.
4.10.9M4 Film station

4.10.9.1 M4-1 Adjustment of the sensor for printed film

The sensor detects the position of the printed film. Adjust to a defined "printing mark".

- Loosen the mounting screw / locking levers.
- Shift the sensor to the format-dependent position. (Set the detecting range on the printing mark of the film).
- Tighten the mounting screw / locking levers.

4.10.9.2 M4-2 adjustment of throttle valve vacuum exhauster

Adjust the vacuum on the film conveyor belt with the throttle.
M4-2A = Operator side
M4-2B = Opposite to operator side

- Loosen the locking levers.
- Set the throttle to the format-dependent position (mark, scale value).
- Tighten the locking levers.
4.10.9.3  M4-4 height adjustment MultiBar

Adjust the height of the film collating system to match the different product heights with the lever handwheel including counter. As for the required format-dependent numbers, see the format list.
4.10.9.4 M4-4.1 change multibars

In order to be able processing products of different size with the required indexing, plug-in bars are mounted in different numbers on various positions. Additionally, plug-in bars can be equipped with milled recesses according to the film width to hinder the inserted film from getting out of place on the bar. The film bars are marked to be allocated to the various formats.

- Colour marks and/or numbers have been fixed on the brackets of the chain carrying the plug-in bars, which indicate the mounting positions for the corresponding number of required bars.
- The table of values delivers the number of bars to be mounted and, where required, the colour code as well.
- Approach the film bar bracket in Jog-mode close to the recess on the guide profile.
- Press in the lock and pull-out/push in the bar.
4.10.9.5  M4 10 adjustment laser pointer film position

The light barrier detects the film end on the corresponding reel by scanning the film reel thickness.

Additionally, the light barrier can be used as aligning aid for the film reels. For that purpose, always set the light barrier in the centre of the film reel, which coincides with the centre line of the product groups.

- Loosen the locking levers.
- Set the light barrier to the format-dependent value.
- Tighten the locking levers.

**WARNING**

In order to exclude possible eye injury, do not directly look into the laser light.
Laser: Class 1 – not hazardous.
4.10.9.6  M4-27 stop collar

The film reels are slid on the film mandrels to make the centre line of the film coinciding with the one of the product group.

- Loosen the hexagon socket-head screw in the stop.
- Set the stop to the format-dependent value, see the table of values.
- Tighten the hexagon socket-head screw in the stop.

- Alternatively, the film reel can be set by means of the sensor "Film position", too. See Adjustment M4-10 / 11.
4.10.10 M7 Tunnel

4.10.10.1 M7-1 to 3 and M7-19 to 21 position adjustment air jets

The air nozzles control the hot-air stream with single or multi-lane operation.
Set the air nozzles to the format-dependent number of lanes and product width.
4.10.10.2  M7-5 and 22 adjustment air jets

The air nozzle throttle limits the air outlet on the air nozzles as regards their height.
The position of the throttles has to be adapted to the product height.
4.10.11 Start after changeover

**Warning:**
Before restart of the machine make sure that there are no tools and/or loose parts left in the machine and nobody is working in and around the machine.

Read and stick to the safety regulations given in the operating manual in the chapter “SAFETY INSTRUCTIONS”.

- Check, if the machine has been mechanically adjusted to the format to be produced.
- Switch-on the compressed air supply (operating pressure 6 bar).
- Set the key-locked selector switch on the control panel ”Power Packer ON / OFF” to ”ON”.
- Actuate the key “General ON” on the control panel.
- Check the selected format in the menu ”Type selection”. That format has to be selected, which the machine has been mechanically adjusted for.
- Make sure that the Jog-key has been removed from the socket.
- Make sure that the selector switch ”Collating system disabled / enabled” on the control panel has been set to “disabled”.
- Close the safety devices.
- Actuate the key ”MAIN DRIVE ON”.
- If parts of the machine have to be synchronised after changeover of format, a corresponding message appears on the screen. Synchronise these machine parts (see chapter operation „Machine setup“).

Further actions to be taken are explained in the chapter ”Operation - „Production start“.
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5 Maintenance

5.1 Generals

Operating failures due to insufficient or improper maintenance may cause very high repair costs and long stoppage times of the machine. Therefore, scheduled maintenance is imperative.

Only carefully serviced machines are able outputting maximum performance on a long-term basis.

Any maintenance intervention is allowed to be performed in protected and dead state of the machine/peripherals.

Disengage all necessary switches to exclude unintentional start-up of the machine.

Lock the main switch on the switch cabinet with separate padlock.

Scheduled service and maintenance operations as explained in the following are critical for faultless operation and long lifetime of the machine.

When replacing spare parts, use KHS-original parts only. We want explicitly point out that neither original nor accessory parts, which have not been not delivered from us, were not tested and approved. As for damage due to the use of non-original and accessory parts of KHS, the manufacturer does not accept any liability.

The operator, who has most contact with the machine, shall report any occurred fault to the experts. Unusual noise in the machine point, in most cases, to upcoming failure in the bearings or moving parts.

KHS urgently recommends to follow the scheduled maintenance of the machine specified herein.
Observing the following instructions provides for high degree of reliable working of the machine:

- Clean as scheduled the optics of the sender-receiver-light barriers with a soft clean rag.
- Same is true for the reflectors of reflection-light barriers.
- Remove foreign matters such as broken glass, cleaning rags and the like from conveying paths of the packing drums.
- Such parts may cause jamming of products and packing drums as well as malcontrol on the light barriers!
- For cleaning, do not use corroding solvents!
- LS-optics and reflectors, paint, electrical parts and machine elements will suffer damage.
- Do not spray the machine with high-pressure steam device!
- Never clean the machine with high-pressure cleaning unit!
5.2 Safety instructions

With all maintenance, inspection and repair operations always observe the regulations „Safety – Fundamentals for the bottling plants of the beverage industry“.

Before starting any inspection or maintenance:

- Shut off the machine
- Disengage the main switch.
- Protect from re-engaging.
- Open the safeguards.
- Shut off the compressed air supply.
- Protect from re-switching on.

In particular, when two maintenance technicians work on a machine, each of them has to protect the machine from unintentional re-switching on with his own padlock. Only when both the padlocks have been removed, the machine can be started.

Only trained electricians are allowed to check and maintain electrical installations.

Hot-setting gluing device

- Before start-up read the technical handbook of the hot-setting gluing device, in every case.
- Take maintenance by qualified staff only.
- With every operation in the hot-setting gluing device wear protective gear and glasses.
- Before intervening into the hydraulic system, relieve the hydraulic pressure from the system (switch off the coating head).
- For cleaning the nozzles, never use open flame, drill or the like.
- Be cautious with handling of melted glue - danger of burning.
- While the machine is running, do not touch the coating heads - danger of burning.

Observe further safety regulations in the technical handbook of the manufacturer of the hot-setting gluing device, in every case.
5.3 Regulations

Stick to the regulations being valid on the respective site of installation of the machine. This is particularly true for regulations and guidelines regarding

- storage, usage and disposal of materials,
- substances, which are hazardous to health and environment,
- storage, usage and disposal of materials to be processed,
- operation of electrical systems and
- respective production site.

5.4 Disposal

Make sure that acids and alkalines are disposed according to the current regulations. Before draining into the sewage-water system, neutralize them.

Check, if replaced parts and waste resulting from maintenance or repair have to be disposed separately.

If required, dispose them according to current regulations.

**Disposal of the following objects and chemical agents is especially important:**

- Oils and greases as well as their containers (for example, sprays, PERMA-grease guns),
- cleaning agents, solvents and coolants,
- batteries, X-ray tubes, neon tubes, and the like, and synthetic materials.
5.4.1 Maintenance schedule

When abnormalities or failures are detected according to the listed checks and inspections, immediately eliminate such abnormalities or failures.

Make sure that electrical parts, switch cabinet and control panel are not washed down with water. Dry all parts, which got wet while cleaning with water and protect them from corrosion with suitable agents.

Stick, by all means, to the scheduled maintenance intervals to prevent machine damage.

Observe the documentation of purchased parts, for example, motors, gearboxes and so on! These documentations give in addition important instructions on maintenance, service, adjustment and so on, for the respective components.
5.4.1.1 Maintenance interval, every 8 operating hours

Take the following maintenance and inspection operations every 8 hours to ensure faultless operation.

Cleaning
Clean the machine and transport equipment. Clean the conveyor belts arranged upstream and downstream to the packing machine with compressed air. In case of heavy contamination, clean with rag and lye.

Light barriers
Clean the optics and reflectors of the light barriers with humid rag and test operationability.

Machine
Test the safety devices for proper functioning.
- Emergency ALL-OFF switches
- Safeguards
Inspect the drive assemblies for damage.
Inspect the functional devices, pilot lamps and indicators for damage.
Inspect hoses and cables for cuts, respectively, fracture.

Gearboxes
Inspect the gearboxes for sealness.

Feeding conveyor
- Check the adjustment of the guiding rails.
- Inspect the plate chains for fracture of single plates and destroyed links.
- With the “Slip Torque” conveyor: Test the single rollers for smooth running.

Blank feed – blank magazine and blank transport
- Check the adjustment of the guiding rails.
- Clean the lenses and reflectors of light barriers in the blank magazine and area of the blank transport equipment (see the sensor schematics).
- Clean the magazine from tray residues, labels, and so on.
- Clean the extraction filter, apply compressed air, if required.

Parting system, upper pushbar chain
- Check the adjustment of the guiding rails.
- Inspect the conveyor belt for contamination and damage.
- Only with parting rack with attached pin: Check the pin for tight seat.
Folding and gluing station

- Check the adjustment of the guiding rails.
- Inspect the folding segments for proper adjustment and contamination.
- Clean the lenses and reflectors of light barriers (see sensor schematics).
- Inspect the hot-setting glue tank for contamination. Keep the cover always well closed.
- Clean the coating heads of the hot-setting glue. Remove clustered hot-setting glue from the spraying heads to assure liable functioning. Replace drop-leaking hot-setting glue spraying heads.
- Inspect guides and chains for contamination or damage.
- When using a coding device, cautiously refill the coding paint. Remove immediately any paint splash with special liquid (use rubber gloves!)

As regards the hot-setting gluing device, hoses and hot-setting glue spraying head, observe the manufacturer's safety and maintenance instructions.

Film station, film cutting mechanism

- Inspect the rubber rollers of the film transport mechanism for wear, unevenness and contamination, if required. Let the rollers dismounted by trained staff and cleaned with hot lye as well as brush, and get them dried, then.
- Remove film residues from the teeth of the knife. For removing, do not use hard tools. If necessary, get the knife dismounted by trained staff. When working close to the film knife, wear firm protective gloves resistant to cuts by knife.
- Inspect the conveyor belts for straight run. Keep oil and grease away from all the film conveyor belts.

Shrinking tunnel

- Remove the transport bars of the tunnel conveyor belt from film residues.
- Remove film residues from the air nozzles.
- Clean the heat retainers (curtains) at the inlet and outlet. Replace damaged curtains.
5.4.1.2 Maintenance interval, every 40 operating hours

Take the following maintenance and inspection operations every 40 hours to ensure faultless operation.

Lubrication
Inspect for sufficient lubrication and re-lubricate, if required, all chains, chain sprockets as well as gears of the film cutting station.

Machine
- Test limit switches, light barriers and proximity switches for proper functioning.
- Check the drive belt for sufficient tension and proper condition. Re-tension as well as replace porous and damaged belts, if required.

Switch cabinet, control panel
Sight check:
- Tightness (humidity)!
- Condition of electrical parts and contacts!
- Loose terminals (scorching)!

Electrical and pneumatic lines
Sight check:
- Chafing spots!
- Buckles!
- Cracks or other damages!
- Tightness of pneumatic lines

Packing drum transport
Check the drive chains for:
- Correct tension!
- Proper lubrication!
- Mechanical condition (sight check)!

Container transport
Check the drive chains for:
- Correct tension!
- Proper lubrication!
- Mechanical condition (visual check)!

Lubricant:
Commercial anti-friction bearing grease
- Shut off the machine.
- Disengage the main switch and lock against reengaging.
- Open the protective door in the area of the film station.
- Grease the bearings through the greasing nipple, as for the position, see below.
Venting of hot-setting glue hoses and heads

The manually operated valve of the hot-setting glue spraying head supplies the valves with compressed air. To vent the hot-setting glue heads, actuate the manually operated valve and at the same time, the valve of the hot-setting glue spraying head. This has to be done after replacement of the hoses and hot-setting glue spraying heads.

Steps to be taken:

- Insert a blank directly under the hot-setting glue spraying head to be cleaned.
- Simultaneously actuate the manually operated valve <1> close to the hot-setting glue station and the valves of the hot-setting glue spraying head <2> by a suitable tool.
- Do not actuate anymore the valve of the hot-setting glue spraying head and manually operated valve, when the hot-setting glue emerges without air from the hot-setting glue spraying head.
- Take out the blank, when the hot-setting glue has got cold.

Blank feed - blank magazine and blank transport

- Grease the vacuum disk of the blank extractor.

Shrinking tunnel

Check the tension of the conveyor belt.
Test the reversing mechanism and guiding rails for smooth running and defects.
5.4.1.3 Maintenance interval, every 170 operating hours

Take the following maintenance and inspection operations every 170 hours to ensure faultless operation.

Machine
Check the boltings on loaded and moving parts.
Inspect the paint for damage,
- if required, remove rust and re-paint damaged spots.
Obey to the instruction for use for the processing of paint components!

Drives
Check all chains, chain sprockets and chain tensioners. Chains and chain sprockets have to be adjusted to run in one and the same plane and precisely aligned. The chain tensioners have to be put in proper position.
Check the overload couplings.

Motors
Clean the cooling air conduits.
Inspect the connecting boxes on the motors for:
- Tightness (humidity)!
- Condition of electrical parts and contacts!
- Loose terminals (scorching)!
- Carry out the maintenance operations on the motors according to the suppliers' operating manual!

Gearboxes
Inspect the oil level in the gearboxes.

Carry out the maintenance operations on the gearboxes according to the suppliers' operating manual!
Pneumatics

Inspect all the pneumatic parts for proper condition and test the function.

Wear

Inspect the chain guiding rails, chains, sprockets, springs and limit switches.

Lubricating system

Inspect the oil and grease lines for sealness.
Inspect all lubricating spots for sufficient lubrication.

Electrical lines

Sight check:
- Chafing spots!
- Buckles!
- Cracks or other damages!

Folding and gluing station

Test the function, smooth running and cleanliness.
- Clean the protective doors and safety circuitry with humid rag. If required, repair with suitable tools
Check the tension, lubrication and inspect for faults.
- Clean the chain tensioners with compressed air, hard cleaning brush, if required, repair with suitable tools.

Central lubrication pump refilling

Lubricant: ARAL Eural Hyd 68
KHS order no.
0.9 litre 301142011102
15 litres 301142011100
or equivalent oil, see specifications under „Instructions for build-in parts and consumables“.
- Test the oiler for proper functioning and sufficient lubrication.
- Refill the oiler.
- Check the coating brushes for condition and proper adjustment.
- As for further descriptions, see the operating manual of the shrinking tunnel and under „Documentation for purchased parts“.

When filling consumables, take care for extreme cleanliness in order to assure both function and effect of the maintenance units!
Water separator of the compressed air supply – maintenance unit draining

- Open the draining plug on the filter receptacle and drain the condensate.
- In case of heavy contamination, clean both the filter receptacle and cartridge, see the manufacturer's instructions.
Maintenance in the film cutting station

Avoid any grease or oil getting on the transport rollers or belts!

Warning!
With every intervention into the film cutting station, wear firm protective gloves resistant to cutting tools!

1. Film cutting knife
   - Clean the film cutting knife (remove film residues).
   - Inspect the film cutting knife for damaged teeth.

2. Film transport rollers
   - Clean the transport rollers.
   - Inspect for wear or unevenness.

3. Film transport belt
   - In case of heavy contamination, clean the film conveyor belt with alcohol.
   - Inspect the transport belt for damages.

4. Conveyor belt
   - In case of heavy contamination, clean the conveyor belt.

5. Film vane
   - Check the adjustment (zero point and reversing height).
   - Replace bent wrapping bars.
5.4.1.4 Maintenance interval, every 500 operating hours

Take the following maintenance and inspection operations every 500 hours to ensure faultless operation.

Film station, film cutting mechanism

Take sight check and if required, tension with suitable tools, repair, respectively, replace:
- The film cutting mechanism, chain sprockets and film cutting bars,
- speed-compensating belt on the transition from the film cutting mechanism to the tunnel – if existing,
- chain sprockets and gears in the area of the film transport mechanism,
- film transport clutch,
- drive chain for film transport.

Test of function, sealness and smooth running, if required, tension with suitable tools, repair, respectively, replace:
- The cylinder valves of conveyor belts in the film system,
- brakes of the film mandrels,
- compressed air to film mandrels,
- automatic film welding, cylinder, reversing rollers,
- automatic film welding equipment, clamping unit, cellular rubber, cylinder

5.4.1.5 Maintenance interval, every 4000 operation hours

General overhaul

We recommend getting the annual maintenance and inspection of the machine carried out by staff either trained or authorised through KHS!

Drive assemblies

Inspect and if required, replace all the chain sprockets and pulleys.
Inspect for:
- Excessive wear on the teeth and flanks
- Worn-out shaft supports

Drive assemblies

Inspect all the toothed belts.
- Inspect for wear (replace worn and porous belts).
- Check the belt tension.
Machine
Check and if required, replace all the bearings:
Inspect for:
- Excessively emerging grease
- Excessive bearing play
- Bearing noise

Container transport
Check the play in the bearings of the reversing and drive shafts.

Pneumatic lines
Inspect and if required, seal or replace the pneumatic lines.
Inspect for
- leaky connectors,
- damaged or leaky lines,
- accumulation of liquids in the pneumatic lines

Pneumatic cylinder
Test and if required, seal or replace the pneumatic cylinder
Inspect for
- proper functioning

Lubrication
- Non-re lubricatable bearings with dismountable casing have been provided with grease filling covering approximately 5000 operating hours by the manufacturer.
- Dismount completely and clean the bearings after approximately 5000 operating hours. Remove entirely old grease residues from both the bearings and shaft. Let the cleaning agent completely drop off!
- Fill the grease chamber with new grease up to half the space. Consider the KHS-lubricant table.
- If required, replace non-re lubricatable bearings with non-dismountable casing. The specified lifetime amounts to approximately 5000 operating hours.

Mechanical switch gears
The switch gears with mechanical contacts are subject to wear. The lifetime of the devices and number of switching cycles to be expected can be learned from the manufacturer's lists.

Electrical switch gears
The electronic devices are free of wear and maintenance. They require, however, sufficient cooling and dry ambient air (General conditions according to VDE 0113, part 1).

Filter
Clean as scheduled and if required, replace the filter mats of the switch cabinet fan (according to local conditions).

Three-phase a.c. motors
Keep clean the cooling air conduits of three-phase a.c. motors and inspect as scheduled the anti-friction bearings.

Brakes
Test the brakes on the motors for inadmissibly long afterrunning. Maintenance intervention in the motors according to the suppliers' operating manual.

Light barriers and light scanners
Basically, protect light barriers, light scanners, electronic and optical devices from splash water both in production and while cleaning.
Clean the optics and reflectors on a daily basis before start of operation.
5.5 Adjustments

5.5.1 Transport chain of the tunnel

- The chains are automatically tensioned by gravity force.
- For that purpose, the chain guide is interrupted in the shown area.
- If there is too big a chain slag (larger slag due to elongation of the chain), shorten or if required replace the transport chain.

- Do not use the reversing rollers B for tensioning the transport chain.
- They only guide the chain on the guiding rails.

Adjust the reversing rollers that the gap (a) between roller and guiding rail amounts to

9.0 mm with wire made-link belts and
10,5 mm with bar-chain transport.
5.5.2 Check of the drive chain of the tunnel transport

- Check the chain tension as scheduled.
- The chain tension remains sufficient as long as the tensioning ring keeps its oval shape.
- When the rings get circular, tension the chain.
- If required, re-tension by shifting the motor assembly. Make sure that the chain sprockets remain aligned.
• The central lubrication system of the packer supplies the drive chain with lubricant.
• Inspect the chain for sufficient lubrication on a regular basis.
• Inspect the lubricant lines for leakage.
• Inspect the coating brushes for condition and proper adjustment.
• Check the chain tension as scheduled.
• The chain tension is sufficient as long as the tensioning traverse of the chain tensioner (pos. 1) is not exceeded. If required, re-tension by shifting the motor assembly. Make sure that the chain sprockets remain aligned.
• The optical control indicator of the chain tensioner works with a colour scale.
  The green mark means that the chain tension stays within the proper working range.
  The red mark indicates that the chain tensioner has to be re-adjusted. If required, shorten or replace the chain.
5.5.3 Check of the drive chain of the unloading belt

Check of the drive chain of the cleaning station

- The central lubrication system of the packer supplies the drive chain with lubricant.
- Inspect the chain for sufficient lubrication on a regular basis.
- Inspect the lubricant lines for leakage.
- Inspect the coating brushes for condition and proper adjustment.
- Check the chain tension as scheduled.
- The chain tension is sufficient as long as the tensioning traverse of the chain tensioner (pos. 1) is not exceeded.
- The optical control indicator of the chain tensioner works with a colour scale. The green mark means that the chain tension stays within the proper working range. The red mark indicates that the chain tensioner has to be re-adjusted. If required, shorten or replace the chain.
5.5.4 Check of the cleaning station

Check of the drive chain of the cleaning station

- The central lubrication system of the packer supplies the drive chain with lubricant.
- Inspect the chain for sufficient lubrication on a regular basis.
- Inspect the lubricant lines for leakage.
- Inspect the coating brushes for condition and proper adjustment.
- Check the chain tension as scheduled.
- The chain tension is sufficient as long as the tensioning traverse of the chain tensioner (pos. 1) is not exceeded.
- The optical control indicator of the chain tensioner works with a colour scale.
  The green mark means that the chain tension stays within the proper working range.
  The red mark indicates that the chain tensioner has to be re-adjusted. If required, shorten or replace the chain.
Brush re-adjustment

Basic adjustment of a new brush:

- Gap between brush holder and stopscrew with non-active cleaning = 10 mm.

- In order to compensate for the wear of the cleaning brush, the traverse of the brush can be extended.

- With activated cleaning, adjust uniformly the stopscrews on both the machine sides that the chain belt gets a little bit pressed upwards against the counter roller to make the counter roller rotating as well.

- Adjust the throttle valve on the compressed air supply system that the cleaning brush gets slowly approached to the transport belt.

- Empty as scheduled the drawer container underneath the cleaning system.

Test the brush assembly for smooth running on a regular basis. If required, clean and slightly grease the lateral guides.
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6 Failures

6.1 Generals

Prerequisites for faultless operation

- Permanently constant quality of the consumables such as film, blanks and glue according to specifications
- Careful adjustment of the format values, respectively no unauthorised alterations
- Faultless and clean folding as well as gluing tools
- Maintenance according to schedule
- As for the proper basic adjustment of the equipment, see the following page.

Faults are indicated as text message on the display of the control unit in the operator panel.

Fault messages are grouped into:

- Informative messages: The machine can start automatically after eradication of the fault.
- Fault messages: The electric power supply is switched off and the fault message has to be acknowledged after eradication.

The blue segment lights when a fault message is active. The text display of the message has to be read off from the operator panel. The blue segment flashes when an informative message is active. The text display of the message has to be read off from the operator panel.

Starting-up the machine after fault message:

- Eliminate the fault.
- Clear the fault message with the pushbutton "CLEAR FAULT“.
- Start the machine with "MAIN DRIVE ON"
  (see also operation, "Start production").

If a fault occurs several times within a short period of time, get the fault cause investigated by specialists.

The fault and information indications appearing on the display are subject to defined priority.

Several faults or information may occur at the same time. In this case, those faults or information with highest priority are indicated. After elimination of the fault and pressing the pushbutton "CLEAR FAULT", the fault with the next lower priority is displayed.
6.2  Safety instructions

- Before intervening into the machine as well as peripherals, in particular in live parts, disengage the main switch and safeguard from re-engaging.
- Repairs are allowed to be performed by the service engineers or authorised personnel only.
- For repair, use original spare parts only.
- Before intervening, let the machine as well as peripherals cool down– otherwise there is danger of burning!

Observe the safety instructions in chapter „Safety“ in every case! Ignoring may lead to burning, injuries, death, for example, by electricity and / or damage of equipment as well as property!

The personnel for operation, maintenance, inspection and assembly has to be properly qualified for these activities (training and instruction have to correspond to the KHS standards). The user has to clearly define the area of responsibility, competence and supervision of the personnel. If the personnel lack the required knowledge, then the staff is to be trained and instructed.

The personnel in charge with intervention into the machine have to carefully read as well as understand the operating manual and in particular, the chapter “Safety instructions”.

Observe all danger as well as safety instructions in the machine and keep them in readable condition.
6.3 Basic adjustment of the machine

Faults may be caused by improper basic adjustment of the machine.

To check the machine adjustment, traverse each drive to its reference position to set all indexing-dependent machine components to basic adjustment.

- The value indicated under „Position“ with the selected axis has to amount to 000 or 360.
- The maximum error from the „Ideal case“ 0° must vary between ± 2°.
- If a higher error is detected, then the reference position has to be re-set.

Check the basic adjustment in regular intervals.

Re-set the „Reference position“ every time after

- separating the electrical terminals of the motor from the controller,
- faulty motor or faulty controller,
- jumping of chains or tooth belt (interrupted production run),
- replacing chain or tooth belt,
- replacing a driving chain, or tooth belt, when the driven tool has been moved away from its position or the drive shaft of the motor has been rotated,
- long stoppage period of the machine.
6.3.1 Check of the reference position of the servodrives

Touch the screen button “Program selection”.

Function is available in the programs „Setting-up“ / „Maintenance“ / “Break“ and with a connected portable control panel!

Connect the control panel to the socket on the operator panel.

- Press the function pushbutton.
  → The menu "015_Special Functions" appears.
Hit the function pushbutton “Servodrives”.

→ The menu „091_ ServoDrives“ appears.

The selected axis can be separately approached by jog keys.

- All the products have to be removed from the machine and the main switch engaged.
- Switch on the power supply with the selector switch „POWER SUPPLY PACKER ON / OFF“.
- Actuate the pushbutton „GENERAL ON“
- Press the pushbutton for the drive assembly of the machine, which is to be checked.
- Hit the pushbutton „Jog mode“
- Traverse the axis to be checked to the mechanical reference position in jog mode.
6.3.2 Setting the reference position of the servodrives

Approach to the reference position mark.
Take check as described in chapter „Reference position check“.

Actuate the pushbutton „Immediate OFF“.

The electrical reference position is allowed to be set only, when the servodrive assembly of the machine has been precisely traversed to the mechanical reference position.

- Press the pushbutton „Reference position setting“
- Actuate „Reference position setting“

The servodrive has been set, when the value has changed from xxx ° in 0° in the column “Position”.
6.3.3 Reference position of the servodrives

6.3.3.1 Reference position overhead driving chain 1

One pusher bar of the overhead pusher bar chain I has to be positioned exactly above the centre of the drive shaft <1>, or one pusher bar of the pusher bar chain I has to be positioned exactly above the mark <2>.
6.3.3.2 Reference position of the parting station

In order to check the reference point of the servodrive, take the same steps as with the drive of the overhead pushbar chain 1.

Bore on the bearing plate for the reference position of the drive.

The centre of the bore and screw must align.
6.3.3.3 Reference position of the blank extractor / blank transport

In order to check the reference point of the servodrive, take the same steps as with the drive of the overhead pushbar chain 1.

The blank push bar of the second blank-transport chain has to be positioned with its flat side precisely over the centre of the reversing chain of the drive.

Or
- one blank push bar of the second blank-transport chain has to be positioned on the reference position (mark).
- one blank push bar of the first blank-transport chain has to align with the reference position (mark).

The blank extractor is actuated by the drive of the blank transport. Check the offset between blank transport and extractor in the following way.

- Make the front edge blank push bar and front edge of the bridge aligning.

- The extractor is horizontally positioned to the blanks on the magazine.
6.3.3.4 Reference position of the folding chains

In order to check the reference point of the servodrive, take the same steps as with the drive of the overhead pushbar chain 1.

Reference position of the rear push bar

Traverse the rear folding push bar of a folding push bar group in jog mode that the rear folding push bar gets precisely positioned over the centre of the drive shaft and coincides with the mark of the reference position.
Referring to the reference position of the rear push bar, adjust the reference position of the front push bar. When the reference position of the rear push bar has been approached to, then the distance between the two push bars amounts to 120mm.
6.3.3.5 **Check the reference position of the film knife**

In order to check the reference point of the servodrive, take the same steps as with the drive of the overhead pushbar chain 1.

- The value indicated under „Actual position“ of the axis 9 must amount to 110.
- The maximum error from the „Ideal case“ 0° is allowed to vary between ± 2°.

Operate the pushbutton ”Jogging Mode” at the yellow pushbutton housing until the reference marks at the pulley and flat piece are aligned. 
Or
Turn the knife shaft manually 
Touch the screen button ”Release Brake”
Turn the knife shaft clockwise by means of a wrench until the reference marks at the pulley and at the flat piece are aligned

The marks correspond to the reference position of the knife shaft, where the meeting point of the knife tips and the tensioned film is reached.
6.3.3.6 Check of the reference position of the multibar

In order to check the reference point of the servodrive, take the same steps as with the drive of the overhead pushbar chain 1.

The marked film wrapping bar with the „0“ for the mechanical reference position has to be positioned at mark <1>. Traverse the film stop into the bottommost position by means of the vertical adjusting mechanism.
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</tr>
<tr>
<td>F0519</td>
<td>Overload contactor metering band packs 1 tripped</td>
</tr>
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<td>F0520</td>
<td>Overload contactor metering band packs 2 tripped</td>
</tr>
<tr>
<td>F0521</td>
<td>Overload contactor metering band packs 3 tripped</td>
</tr>
<tr>
<td>F0522</td>
<td>Overload contactor metering band packs 4 tripped</td>
</tr>
<tr>
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<td>Feed band frequency inverter fault</td>
</tr>
<tr>
<td>F0561</td>
<td>Product and blank not synchronized 1</td>
</tr>
<tr>
<td>F0562</td>
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</tr>
<tr>
<td>F0563</td>
<td>Blank not correct in Tray Transport</td>
</tr>
<tr>
<td>F0564</td>
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</tr>
<tr>
<td>F0565</td>
<td>Overload contactor vacuum pump tripped</td>
</tr>
<tr>
<td>F0566</td>
<td>Fallen Product - Overhead Pushers</td>
</tr>
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<td>Overhead pusher 1 overload clutch tripped</td>
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<td>Overhead pusher overload alarm</td>
</tr>
<tr>
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</tr>
<tr>
<td>F0594</td>
<td>Product detection for gluing not OK</td>
</tr>
<tr>
<td>F0595</td>
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</tr>
<tr>
<td>F0596</td>
<td>Product incorrect - folding chain</td>
</tr>
<tr>
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</tr>
<tr>
<td>F0599</td>
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</tr>
<tr>
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</tr>
<tr>
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<td>Carton not correctly glued</td>
</tr>
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</tr>
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</tr>
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</tr>
<tr>
<td>F0626</td>
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</tr>
<tr>
<td>F0627</td>
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</tr>
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<td>F0628</td>
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</tr>
<tr>
<td>F0629</td>
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</tr>
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</tr>
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</tr>
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</tr>
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<td>F0660</td>
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</tr>
<tr>
<td>F0661</td>
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</tr>
<tr>
<td>F0662</td>
<td>Heated Zone 1 temperature too high</td>
</tr>
<tr>
<td>F0663</td>
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</tr>
<tr>
<td>F0664</td>
<td>Heated Zone 3 temperature too high</td>
</tr>
<tr>
<td>F0665</td>
<td>Heated Zone 4 temperature too high</td>
</tr>
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<td>Speed compensation band frequency converter fault</td>
</tr>
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</tr>
<tr>
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</tr>
<tr>
<td>F0771</td>
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</tr>
<tr>
<td>F0772</td>
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</tr>
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</tr>
<tr>
<td>F0774</td>
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</tr>
<tr>
<td>F0775</td>
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</tr>
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6.4.2 Warnings

**W0001: PLC buffer battery - Please change**
Yellow flashing information related location in the graphical representation of the machine on the operator’s control panel - main control enclosure. The machine stops. The back-up battery of the PLC is empty. Fault message for service technician.

*Do not switch off the main, disconnect at the main control enclosure. Otherwise the logic program data is erased from the controller.*

**W0020: Maintenance cooling device 1**
Yellow flashing information related location in the graphical representation of the machine on the operator’s control panel - main control enclosure. A thermal sensor inside the main control enclosure cooling device has detected an over-temperature caused by choked filter mats. Clean filter mats or replace if necessary. When the cooling device has reached a defined lower temperature the information message disappears from the screen.

**W0030: Lubrication machine required**
Type: Manual lubrication BASIC
The blue segment of the bar lamp flashes.
The lubrication interval of the machine has been reached. The operator has to actuate the hand lubricating pump until the blue pilot lamp in the electric torch extinguishes. If the pump is not actuated or the pressure switch does not react, the machine stops after a defined time and indicates “Fault”.

**W0031: Minimum machine lubricant**
and yellow flashing information related location in the graphical representation of the machine on the operator’s control panel - Lubricant Pump - Machine. The machine does not stop. The lubricant tank is empty.
- The lubricant pump does not start.
- Fill up the lubricant tank
- Loosen the security screw on the tank lid.
- Remove the tank lid
- Take care no dirt gets into the tank
- Fill up the lubricant tank with Eural Hyd 68
- Replace the tank lid
- Tighten up the security screw

If the lubrication tank is not filled up then after a production time of about 8 hours, the machine will stop and the fault message F1039: Fault - Lubrication will be displayed on the monitor screen.
W0032: Fault - Machine Lubrication

and yellow flashing information related location in the graphical representation of the machine on the operator’s control panel - Lubricant Pump - Machine. The machine does not stop. There is a fault in the machine lubrication system.

- Pressure switch not activated during the active period.
- Pump switched off
- Defective lubricant pipework
- Defective pipe joint
- Defective pressure switch
- Check the lubricant pipework
- Select manual lubrication:
  - Start from the “Production” screen
  - Touch the screen button “Function Enable”.
  - The “FunctionEnable1”-menu appears on the monitor screen.
  - Touch the screen button “Next screen”
  - The “FunctionEnable2”-menu appears on the monitor screen.
  - Open up the bleeding screw at the last proportioning valve.
  - Touch the screen button ”Manual lubrication machine” and keep it pressed until lubricant comes out at the bleeding screw.
  - Collect the lubricant.
  - Tighten the bleeding screw at the last proportioning valve.
  - Touch the screen button ”Manual lubrication machine” until the operating pressure in the lubrication system has built up.
  - When the operating pressure is reached the sign of the screen button changes to the green hook
  - Release the screen button ”Manual lubrication machine”
  - Touch the screen button ”Previous screen” 2x
  - The “Production” screen appears on the monitor screen.

W0033: Operating mode Touch Start/Stop selected

The plug of the jogging push-button on the yellow push-button housing has been plugged into the socket on the side of the machine frame or at the operator panel.
W0034: Service mode is ON

In the “Program Selection”-menu the “Change over”, “Maintenance” or the “Set up”-program has been selected and accepted. The low machine speed is preselected and the following functions of the machine are inhibited:

- Positioned stop - External
- Collating System Deactivate - External
- “Maximum” - Machine Discharge - External
- Tail Back-up - External
- Temperature regulation for the hot-melt adhesive unit and the tunnel

W0035: Filling / emptying activated

The warning message is displayed. In the menu “Program Selection” --> “Production - Start-up / Production - Run down” --> the screen button ”Filling” or “Empty” has been activated

See paragraph “Machine Filling / Emptying” in this manual.

W0036: Stand-by speed - externally activated

The machine speed is reduced to stand-by speed by a signal from an external source. When the information message has disappeared the machine speed is raised automatically to production speed.

W0041: Minimum lubricant 2

and yellow flashing fault location in the machine graphics - lubricant pump - folding chain. The machine does not stop.

Fault in the lubrication system of the folding chain.

- Pressure switch is not activated during operating time.
- The pump is switched off.
- Leaky lubricant line
- Faulty lubricant connection
- Faulty pressure switch.
- Pipework control
- Selection of manual lubrication:
  - Starting from the menu „Production“.
  - Actuate the pushbutton „Function selection”.
  - The menu „FunctionEnable1” appears on the screen.
  - Open the bleeding plug on the last metering valve.
  - Actuate the pushbutton “Function OFF” close to the box „Manual lubrication folding station” and keep the pushbutton pressed, until lubricant emerges from the bleeding plug.
  - Collect the lubricant.
  - Tighten the bleeding plug on the last metering valve.
  - Actuate the pushbutton “Function OFF” close to the box „Manual lubrication folding station” until the working pressure in the lubrication system has built up.
  - The working pressure will be reached, when no fault message regarding the lubrication system is output.
  - Release the pushbutton “Function OFF” close to the box ”Manual lubrication folding station”.
  - Actuate the pushbutton “Previous page” and the menu “Production” appears on the screen.
W0042: Fault - lubrication 2

and yellow flashing information related location in the graphical representation of the machine on the operator’s control panel - Carton Folding Chain Lubrication Pump. The machine does not stop. There is a fault in the machine carton folding chain lubrication system.

- Pressure switch not activated during the active period.
- Pump switched off
- Defective lubricant pipework
- Defective pipe joint
- Defective pressure switch
- Check the lubricant pipework
- Select manual lubrication:
  - Start from the “Production” screen
  - Touch the screen button “Function Releases”.
  - The “Function Releases”-menu appears on the monitor screen
  - Open up the bleeding screw at the last proportioning valve.
  - Touch the screen button “Manual lubrication grease” and keep it pressed until lubricant comes out at the bleeding screw.
  - Collect the lubricant.
  - Tighten the bleeding screw at the last proportioning valve.
  - Touch the screen button ”Manual lubrication folding section” until the operating pressure in the lubrication system has built up.
  - When the operating pressure is reached the sign of the screen button changes to the green hook
  - Release the screen button ”Manual lubrication folding section”
  - Touch the screen button ”Previous screen” 2x
  - The “Production” screen appears on the monitor screen.

W0100: Communication fault
IVO/Adjustment

Possible causes:
One of the modules failed, faulty line connection

W0101: Adjustments not in position

One or several adjusting mechanism(s) has (have) not yet reached their proper position or one of the position displays has not yet been acknowledged.

W0102: Setvalues for Adjustment not sent

A transmission error occurred while sort loading.
Reload the sort.
### W0129: Overhead Pushers not synchronised

- and yellow flashing information related location in the graphical representation of the machine on the operator’s control panel - Overhead pusher bar chain. The overhead pusher bar servo drive unit needs to be synchronised to the “main drive”.
- In the “Production” screen touch the screen button “Synchronise Machine”.
- The ”Machine Synchronisation” menu appears on the monitor screen.
- Touch the “Function” button “Overhead Pusher Bar Chain” and keep the button pressed.
- The overhead pusher bars moves to its “Synchronized Position” and then it stops. Stop touching the screen button.
- The colour field next to the “Function” button changes to green.
- All colour fields next to the “Function” buttons must be illuminated (green).
- Touch the screen button ”Previous screen”
- The “Production” screen appears on the monitor screen.
- In the “Production” screen the screen button “Synchronise Machine” is illuminated (green).

The drive must be synchronized, see W0129

### W0132: Collating system not synchronised

The drive must be synchronized, see W0129

### W0134: Blank feed not synchronised

The drive must be synchronized, see W0129

### W0135: Folding chain not synchronised

The drive must be synchronized, see W0129

### W0136: Axis not synchronised - axis 8

The drive must be synchronized, see W0129

### W0137: Film cutting not synchronised

The drive must be synchronized, see W0129

### W0139: Multibar not synchronised

The drive must be synchronized, see W0129
**W0289: Blank suction not correct**

and yellow flashing information related location in the graphical representation of the machine on the operator’s control panel - Blank Feed Section. The collating system stops. The machine speed is reduced. A blank has not been extracted from the magazine. The blank jogging system in the magazine is switched on. If after this an extracted blank is detected the collating system starts and the machine speed is increased to that being called for by the control system.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torn vacuum cup</td>
<td>Exchange</td>
</tr>
<tr>
<td>porous vacuum cup</td>
<td></td>
</tr>
<tr>
<td>Poor quality blanks</td>
<td>Save up the poor quality blanks and eventually increase the vacuum by means of the pump hand valve and then run the machine using the saved up blanks.</td>
</tr>
<tr>
<td>The setting of the blank retainers at the Reset magazine exit has been disturbed.</td>
<td>Reset</td>
</tr>
<tr>
<td>The magazine side guides are set too tightly the wing up against the blanks.</td>
<td>Set guides correctly by means of the handwheels.</td>
</tr>
<tr>
<td>Dirty photo-electric sensor in the blank magazine.</td>
<td>Clean and check the sensor.</td>
</tr>
<tr>
<td>- No fill up prompt to the operator so the magazine is completely emptied.</td>
<td></td>
</tr>
<tr>
<td>Defective blank jogging system.</td>
<td>Check pneumatics.</td>
</tr>
<tr>
<td>Leaky vacuum tubing.</td>
<td>Check the vacuum tubing between the vacuum pump and the vacuum cups.</td>
</tr>
<tr>
<td>Vacuum pump inefficient.</td>
<td>Check the vacuum pump.</td>
</tr>
<tr>
<td>Clean the black vacuum filter.</td>
<td></td>
</tr>
<tr>
<td>Unsatisfactory vacuum pump performance.</td>
<td>Clean the vacuum filter and fit filter cartridges in the correct position.</td>
</tr>
</tbody>
</table>

**W0306: Tray wall sensor actuated**

and yellow flashing information related location in the graphical representation of the machine on the operator’s control panel - Film Wrapping Section - Entry Band. Blue segment of the pillar signal lamp blinks, warning klaxon sounds. An open tray wall has been detected. The machine does not stop. The klaxon ceases and the information message disappears from the screen when the tray wall check sensor is no longer being actuated. The machine stops if a predetermined number of open tray walls are detected. For a fault description see “Faults” in this manual.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot-setting glue tank is empty</td>
<td>Refill hot-setting glue granulate and wait until the granulate has melted.</td>
</tr>
<tr>
<td>Poor cardboard quality, the inner cardboard layer got loose from the outer one.</td>
<td>Use a new lot of cardboard, if required, demand for better quality.</td>
</tr>
<tr>
<td>Insufficient quantity of hot-setting glue applied</td>
<td>Increase the respective parameter in the panel.</td>
</tr>
</tbody>
</table>
W0308: Synchronize Folding Chain Not Possible

and yellow flashing information related location in the graphical representation of the machine on the operator’s control panel - Tray Folding Chain. The flight bars of the overhead pusher bar chain are in an inconvenient position in relation to the folding flight attachments of the tray folding chain.

Attention:: The fault may only be removed by a service technician. Risk off destroying certain machine parts.

1. Find out whether a flight bar of the overhead pusher bar chain or a folding flight attachment of the tray folding chain is in the leading position in the direction of production.
2. Switch on the “Jog-Mode” of this servo drive unit
3. Operate the “Jog-Mode” push-button, until warning W0308 is not displayed any more.

- The two elements have now reached a position which is not critical for synchronisation.

W0337: Film welding time set too long

The value determining the duration of the film welding process is set too high and exceeds the maximum time of 4 seconds. Set the welding time in the data bank to a maximum of 4 seconds.

W0338: Film wrap check sensors not OK

and yellow flashing information related location in the graphical representation of the machine on the operator’s control panel - Film Wrap Check. The machine does not stop. Film Wrap Check sensor defective, not correctly adjusted or the setting of the sensor is inexact. Check the sensor and the photo-electric sensor. See Manufacturer's Documentation. Info message for service technician.
W0339: Film wrap check sensors actuated

and yellow flashing information related location in the graphical representation of the machine on the operator’s control panel - Film Wrapping Check. Warning klaxon sounds. The cut length of film is not exactly wrapped around the product group. The klaxon and the Information Message are switched out as soon as the film wrap check sequence ends. The machine stops if there is a series of a certain number of film wrap faults. Fault description - see “Faults” in this manual.

W0340: Change film reel

and yellow flashing information location in the machine graphics - Automatic film welding.
The machine does not stop. Change the film reel 1 or 2. As for attaching of the new film reel, see under "Automatic film welding station".

W0341: Dancer cylinder leaky - risk of injury

and yellow flashing information related location in the graphical representation of the machine on the operator control panel Dancer. During a stop of the machine the position of the dancer has changed to a lower position. The cause of this warning message has to be found in a test, e.g. film reel change-over, dancer arm lowered or dancer cylinder or/and its associated pneumatic components are leaky.

Test sequence:
1. Close the protection devices and start the machine by means of the button “MAIN DRIVE ON”
2. Operate the button “FILM MANUAL THREADING”
   - the dancer is lowered
   - the warning message disappears.
3. Stop the machine by means of the button “CYCLE STOP”
4. Start the machine by means of the button “MAIN DRIVE ON”
   - The dancer moves to its working position
5. Stop the machine by means of the button “CYCLE STOP”
   - Do not open the safety devices.
   - Do not operate the selector switch "FILM REEL CHANGE-OVER”
6. After >6 seconds, start the machine by means of the button “MAIN DRIVE ON”
7. Repeat the steps 4 and 5 three times.

If the warning message W0341: “Dancer cylinder leaky - risk of injury” is displayed after the machine was switched off three times, then the dancer cylinder or/and its associated pneumatic components are leaky and it has to be replaced. Warning message for service technician.
W0353: Fault - Tunnel Lubrication

and yellow flashing information related location in the graphical representation of the machine on the operator’s control panel - Tunnel. The machine does not stop. There is a fault in the tunnel lubrication system.

- Pressure switch not activated during the active period.
- Pump switched off
- Defective lubricant pipework
- Defective pipe joint
- Defective pressure switch
- Check the lubricant pipework
- Select manual lubrication:
  - Start from the “Production” screen
  - Touch the screen button “Function Enable”.
  - The “FunctionEnable1”-menu appears on the monitor screen.
  - Touch the screen button ”Next screen”
  - The “FunctionEnable2”-menu appears on the monitor screen.
  - Open up the bleeding screw at the last proportioning valve.
  - Touch the screen button ”Manual lubrication tunnel” and keep it pressed until lubricant comes out at the bleeding screw.
  - Collect the lubricant.
  - Tighten the bleeding screw at the last proportioning valve.
  - Touch the screen button ”Manual lubrication tunnel” until the operating pressure in the lubrication system has built up.
  - When the operating pressure is reached the sign of the screen button changes to the green hook
  - Release the screen button ”Manual lubrication tunnel”

W0354: Minimum Tunnel lubrication

and yellow flashing information related location in the graphical representation of the machine on the operator’s control panel - Lubricant Pump - Tunnel. The machine does not stop. The lubricant tank of the tunnel is empty.

- The lubricant pump does not start.
- Fill up the lubricant tank
- Loosen the security screw on the tank lid.
- Remove the tank lid
- Take care no dirt gets into the tank
- Fill up the lubricant tank with Eural Hyd 68
- Replace the tank lid
- Tighten up the security screw

If the lubrication tank is not filled up then after a production time of about 8 hours, the machine will stop and the fault message F1039: Fault - Lubrication will be displayed on the monitor screen.
**W0355: Low temperature - Heated zones tunnel**

and yellow flashing information related location in the graphical representation of the machine on the operator’s control panel - Tunnel. The machine does will not start. The tunnel working temperatures have not been reached. Touch the screen button “Tunnel” in the “Production” menu.

Switch on the tunnel, wait until the working temperatures have been reached. Watch the temperature indicator in the “Tunnel” screen. When the working temperatures have been reached and the information message has disappeared from the screen the machine can be started by operating the button “MAIN DRIVE ON”

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage supplies not switched through.</td>
<td>Switch on the voltage supplies and wait until the working temperatures have been reached.</td>
</tr>
<tr>
<td>Fuses tripped.</td>
<td>Find and rectify fault causing fuses to trip. Switch fuses back in.</td>
</tr>
<tr>
<td>Defective heating element.</td>
<td>Exchange heating element. Observe the maintenance instructions.</td>
</tr>
<tr>
<td>Thermostats not correctly set.</td>
<td>Check the settings of the three thermostats and check against information given in the circuit diagram “Regulation – Heating Zones I &amp; II.</td>
</tr>
<tr>
<td>Unit not switched on.</td>
<td>Switch on</td>
</tr>
</tbody>
</table>
6.4.3 Faults

**F0001: 24V DC supply absent**

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Main Control Enclosure. One or more of the automatic circuit breakers of the 24V direct current supply have tripped. The machine stops immediately. Fault message for service technician. Check circuit breakers. Trace the fault. After the fault has been found and cleared switch on the circuit breakers. Restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short circuit in the wiring</td>
<td>Trace the fault</td>
</tr>
<tr>
<td>Short circuit in the wiring</td>
<td>Locate the fault by breaking circuit connections one after the other and switching in the circuit breaker until it does not trip.</td>
</tr>
</tbody>
</table>

**F0002: 220V AC supply absent**

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Main Control Enclosure. One or more of the automatic circuit breakers or motor contactors in the 220V, 115V, and 48V AC circuits have tripped. The machine stops immediately. Fault message for service technician. Check circuit breakers and contactors. Trace the fault. After the fault has been found and cleared switch on the circuit breakers or contactors. Restart the machine by operating the buttons “FAULT RESET” and “MAIN DRIVE ON”.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short circuit in the wiring</td>
<td>Trace the fault</td>
</tr>
<tr>
<td>Short circuit in the wiring</td>
<td>Locate the fault by breaking circuit connections one after the other and switching in the circuit breaker until it does not trip.</td>
</tr>
</tbody>
</table>

**F0003: Machine overload contactor tripped**

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Main Control Enclosure. The machine stops immediately. Fault message for service technician. A machine overload relay or a thermistor actuated relay has tripped. Check electrical parts of machine. When cause has been found and rectified reset the overload or thermistor activated relay. The machine can then be restarted by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short circuit in the wiring</td>
<td>Trace the fault</td>
</tr>
</tbody>
</table>
F0004: Tunnel overload contactor tripped

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Control Enclosure. The machine and the tunnel stop immediately. Fault message for service technician. A motor overload relay or a thermistor actuated relay in the tunnel circuitry has tripped. The tunnel should be emptied as quickly as possible.

- Pull the lever with black round knob at the tunnel discharge and turn it downwards.
- The opening for the handcrank is freed
- Place the handcrank onto the journal of the drive shaft of the tunnel conveyor
- Turn the handcrank in running direction until all products have left the film shrink tunnel
- Take off the handcrank
- Pull the lever with black round knob at the tunnel discharge and turn it upwards into horizontal position.
- The opening for the handcrank is blocked. Check motors and mechanical parts of the tunnel (stiffness, seizure, blockage?).

Reset the overload relay or thermistor relay. Restart machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defective bearing</td>
<td>Exchange the bearing</td>
</tr>
<tr>
<td>Stiffly running chain</td>
<td>Check chain tensioners, chain sprockets must be correctly lined up. Check chain lubrication.</td>
</tr>
<tr>
<td>Excessively large voltage swings.</td>
<td></td>
</tr>
<tr>
<td>Cable breakage, short-circuit</td>
<td>Exchange cable.</td>
</tr>
</tbody>
</table>

F0005: Type not loaded

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Operator’s Control Panel. The type data record does not agree with the type data record of the PLC. The type data record has been altered. Load the original type data afresh. Set selector switch “POWER PACKER ON / OFF” to “OFF” and then back to “ON”. The fault message “format data setting not OK” disappears from the screen. Restart machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

F0006 Overload protection of the band assembly has reacted

The machine stops immediately or does not start. Fault message for the service engineer.
A motor overcurrent relay of the band assembly has reacted.
F0016: Safety relay of the guard doors disturbed.

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Control Enclosure. The machine will not start. Fault message for service technician. The check-back response of the power supply for the servo drive units is absent. The power supply contactors and their initiators should be checked. When cause has been found and rectified the machine can then be restarted by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

F0033: Overload contactor power supply servo drives tripped

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Main Control Enclosure. The machine stops immediately. Fault message for service technician. A motor overload relay or a thermistor actuated relay has tripped. Check servo motors and mechanical parts of machine (stiffness, seizure, blockage ?). When cause has been found and rectified reset the overload or thermistor activated relay. The machine can then be restarted by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

F0034: Overload contactor power supply servo controller tripped

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Main Control Enclosure. The machine stops immediately. Fault message for service technician. The overload relay of the power supply off the PPC has tripped. Check power supply of the PPC. When cause has been found and rectified reset the overload or thermistor activated relay. The machine can then be restarted by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

F0096: Programming fault S7 occurrence

The machine does not start. The PLC detected a programming error as well as wrong data module address. Error message for the service engineer.

F0097: Peripheral accessing fault S7 occurrence

The machine does not start. Access to a not existing or / and faulty component. Fault message for the service engineer.
F0098: Fault Communication PLC <-> HMI
The communication is monitored by a “Watchdog”. If within a certain time there is no exchange of data then when this fact is signalled the machine stops. Fault message for service technician. The relative cabling and connections must be checked. After the cause of the failure has been found and corrected the screen strip “Reconnect Communication” will have to be touched. If after some time the screen does not change over to fault indication mode then this strip should be touched once again. If the screen does switch over to the fault indication mode then communication has been re-established. The fault message can be cleared from the screen by operating the button “RESET FAULT”. The function of the “Watchdog” can be seen in the menu “System Check”. Restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

F0099: Fault during rapid cam change
For the service engineer only. During production run, a cam has been improperly altered.

F0108: Loss of a DP-Master
The machine stops or does not start. In the machine the bus system Profibus-DP (Decentral Peripherals) is installed. The PLC represents the master. According to configuration several masters can be installed on the profibus. When this master fails, then this fault is indicated. Check the terminals on the violet cables in the switch cabinet and to the operator panel. When the fault has been eliminated, actuate the pushbutton „CLEAR FAULT“ and start the machine with the pushbutton „MAIN DRIVE ON“. If the fault remains active, call for a service engineer.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loose terminals of the components, plug not properly attached and fixed</td>
<td>Loosen the mounting screws, pull off the plugs and re-attach, tighten the mounting screws.</td>
</tr>
<tr>
<td>Improper switch position on the plugs</td>
<td>Set the switch to “ON” at the two ends of the violet cable (CPU and the component, whose plug only one violet cable has been connected at). Set the switch to “OFF” with all intermediate connectors having two violet cables on the plugs.</td>
</tr>
</tbody>
</table>
F0109: DNET general device failure

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Main Control Enclosure. The machine stops immediately. Fault message for service technician. The plugs of the actuator and sensor elements connected to the decentralised Flex I/O modules are not correctly connected. The plug to the PPC is not correctly connected. Check cables and plugs. Check red LEDs on FLEX I/O modules. When the fault has been cleared, restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

F0110: DeviceNet supply missing

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Main Control Enclosure. The machine stops immediately. Fault message for service technician. The 24V power supply of the Device Net is not present. Check the wiring and the power supply unit. When the fault has been cleared, restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

F0111: DP - Station 4 DP/AS-I link fault

The machine does not start.

The station 4 represents a profibus slave and at the same time, the AS-I-master. The station 4 failed, but still responds and outputs a diagnostic message. Referring to the station diagnosis, the service engineer can localise as well as eliminate the fault.

F0112: DeviceNet transmission fault PPC

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Main Control Enclosure. The machine stops immediately. Fault message for service technician. The Device Net link to the PPC has been broken. On rare occasions this can briefly occur as soon as the PPC leaves the parameter mode. When the fault has been cleared, restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

F0113: - F0127: Fault DP-station 5 - 19

The machine does not start.

The stations 5 ..... 19 represent profibus slaves. The stations 5 ..... 19 fail, but yet respond and output a diagnostic message. Referring to the station diagnosis, the service engineer can localise as well as eliminate the fault.
F0135: - F0165:  
Fault AS-I Master 1 - Slave 1 - 31

The machine does not start. In the machine, the bus system AS-I (actuator-sensor interface) is installed. The sensors and actuators supply their stati about the single modules to the PLC. When one or several slaves fail, one or several of these fault messages is/are indicated. Check the terminals on the yellow cables to the concerned slaves in the machine.

When the fault has been eliminated, actuate the pushbutton „CLEAR FAULT“ and start the machine with the pushbutton „MAIN DRIVE ON“. If the fault does not disappear, call for a service engineer.

The modules have been provided with the so-called slave addresses. When a slave fails, this one supplies a diagnostic message to the PLC. Referring to the station diagnosis, the service engineer can localise as well as eliminate the faults.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loose terminals in the slave, pins did not penetrate through the isolation.</td>
<td>Loosen the mounting screws of the slave cover. Remove the cover, inspect the yellow and black cables for proper contact in the cable guide of the housing. Attach the slave cover and tighten the mounting screws.</td>
</tr>
<tr>
<td>Heavy mechanical stress, thus no contact anymore</td>
<td>Remove and attach the slave cover – as described under a) - but at another place of the cables utilising the cable loops. Inspect the cables for coarse damage.</td>
</tr>
<tr>
<td>Cable fracture or single-wire fracture</td>
<td>Cut completely the yellow cable and re-install connection to the slave through a coupling module.</td>
</tr>
</tbody>
</table>

F0166: Earth Fault  
AS-I Master 1

The machine does not start. Short circuit in the yellow cable. Yellow cable faulty. Isolation defect. The bare cable contacts the machine frame. Only a trained technician is allowed inspecting the cable as well as eliminating the fault. After eradication of the fault, start the machine. At first, press the pushbutton „Test / Reset“ of the AS-i power supply unit in the switch cabinet. Test that the control units of the Asi-circuit works faultlessly. Watch the LED-displays. When the As-i control units work properly, start the machine in the usual way.
F0297: Collating system drive 1 (servo 41) disturbed

Fault message for the service engineer. An error occurred with data transmission from the PLC via the PPC to the relevant axis (servodrive). Inspect the electrical terminals on the indicated controller. Inspect the glass-fibre cable on all the controllers. A technician is recommended to eliminate the fault and inspect the installation.

F0298: Collating system drive 2 (servo 42) disturbed

F0299: Collating system drive 3 (servo 43) disturbed

F0300: Collating system drive 4 (servo 44) disturbed

F0303: Folding chain drive 1 (servo 47) disturbed

F0304: Folding chain drive 2 (servo 48) disturbed

F0334: Servo control in init phase

The machine does not start. The initialisation phase of the servomotor controller runs. The PPC verifies new parameter values. Wait until the fault message F0334: “Wait until the servo controller in initialisation phase” extinguishes. Start the machine with the pushbuttons „CLEAR FAULT” and „MAIN DRIVE ON”.

F0335: Error during Cam loading to PPC

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Control Enclosure. The machine will not start. Fault message for service technician. During cam loading from the PLC to the servo control PPC an error has occurred. This error cannot be acknowledged. It will be automatically cleared as soon as the type is successfully loaded in the PPC. Countermeasure: The type must be loaded afresh. When the fault message disappears start machine by operating the button “MAIN DRIVE ON”.

F0336: Fault - PPC

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Control Enclosure. The machine will not start. Fault message for service technician. Collective fault for all servo faults. When it concerns a fault on a regulating module then the exact cause will be given by a subsequent regulating module indication. When the fault has been cleared, restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

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F0337: Parameter Error PPC

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Control Enclosure. The machine will not start. Fault message for service technician. During the intelligibility check the PPC has detected an error in the format data. The type data must be loaded afresh or erroneous settings must be corrected. When the fault has been cleared, restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

F0338: Error while loading data (PLC - PPC)

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Control Enclosure. The machine will not start. Fault message for service technician. It is during the transfer from the PLC to the PPC that the message appears. If the transfer is successful then the Fault message disappears automatically. If the Fault message does not disappear then it means that an error has arisen during the data transfer from the PLC to the servo control system PPC. The error cannot be acknowledged. It will be automatically cleared as soon as the type has been successfully loaded into the PPC. When the fault has been cleared, restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

F0339: Fault Communication PLC <-> PPC data write

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Control Enclosure. The machine will not start. Fault message for service technician. There has been an error in the transfer of data from the PLC to the servo control system PPC. This error cannot be acknowledged. It will be automatically cleared as soon as the type has been successfully loaded into the PPC. The type must be loaded afresh. When the fault has been cleared, restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

F0340: Fault Communication PLC <-> PPC data read

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Control Enclosure. The machine will not start. Fault message for service technician. There has been an error in the transfer of data from the PLC to the servo control system PPC. This error cannot be acknowledged. It will be automatically cleared as soon as the type has been successfully loaded into the PPC. The type must be loaded afresh. When the fault has been cleared, restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

F0341: Watchdog
PPC (Servo-Drives) and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Control Enclosure. The machine will not start. Fault message for service technician. There has been an error in the transfer of data to the servo control system PPC. This error cannot be acknowledged. It will be automatically cleared as soon as the type has been successfully loaded into the PPC. The type must be loaded afresh. When the fault has been cleared, restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

F0342: Parameter mode PPC active and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Control Enclosure. The machine will not start. Fault message for service technician. The drive control system (PPC) has received new data whereby the parameters are to be recalculated (Parameter Mode). As soon as the parameters have been calculated the PPC returns to the operative mode and the machine can be restarted. If the fault persists: Correct the fault with assistance from KHS Kisters.

F0343: Demand 'Send axis data' is active and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Control Enclosure. The machine will not start. Fault message for service technician. The process of sending new data from the PPC for the servo drive units is proceeding. As long as this message remains on the screen the machine cannot be started. If the fault persists: Correct the fault with assistance from KHS Kisters.

F0344: Curve calculation running and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Control Enclosure. The machine will not start. Fault message for service technician. The curve calculation is running. When the fault message disappears start machine by operating the button “MAIN DRIVE ON”.

F0345: Timeout while writing cams to the PPC and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Control Enclosure. The machine will not start. Fault message for service technician. During the data transfer from the PLC to the servo control PPC an error has occurred. This error cannot be acknowledged. It will be automatically cleared as soon as the type is successfully loaded into the PPC. Countermeasure: The type must be loaded afresh. When the fault message disappears start machine by operating the button “MAIN DRIVE ON”.
<table>
<thead>
<tr>
<th>Code</th>
<th>Fault Message</th>
<th>Countermeasure</th>
</tr>
</thead>
<tbody>
<tr>
<td>F0346</td>
<td>MSG fault writing the integer values (see Servo diagnostic)</td>
<td>When the fault message disappears start machine by operating the button “MAIN DRIVE ON”.</td>
</tr>
<tr>
<td>F0347</td>
<td>MSG fault writing the float values (see Servo diagnostic)</td>
<td>When the fault message disappears start machine by operating the button “MAIN DRIVE ON”.</td>
</tr>
<tr>
<td>F0348</td>
<td>MSG fault during activation of the axes (see Servo diagnostic)</td>
<td>When the fault message disappears start machine by operating the button “MAIN DRIVE ON”.</td>
</tr>
<tr>
<td>F0349</td>
<td>MSG fault writing the axis parameters (see Servo diagnostics)</td>
<td>When the fault message disappears start machine by operating the button “MAIN DRIVE ON”.</td>
</tr>
</tbody>
</table>
F0350: MSG fault during curve calculation (see Servo diagnostic)

MSG = message, PPC = drive control

Fault message for service technician. During the data transfer from the PLC to the servo control PPC an error has occurred. It is also possible that the type data is erroneous. This error cannot be acknowledged. The message will be cleared from the screen automatically as soon as the type has been successfully loaded into the PPC. Countermeasure: The type must be loaded afresh - or the erroneous value must be corrected. When the fault message disappears start machine by operating the button “MAIN DRIVE ON.”

F0351: Timeout Cam profile calculation

Fault message for service technician. During the data transfer from the PLC to the servo control PPC an error has occurred. Timeout. It is also possible that the curve data is erroneous. This error cannot be acknowledged. The message will be automatically cleared from the screen as soon as the curve data has been successfully loaded in the PPC. Countermeasure: The type must be loaded afresh - or the erroneous value must be corrected. When the fault message disappears start machine by operating the button “MAIN DRIVE ON.”
F0353: Main drive (servo 1) disturbed  
Fault message for service technician. A fault has occurred during the data transfer from the PLC via the PPC to the relevant axis (servo drive).
Check the electrical connections at the relevant controller.
Check the fibre-optic cables at all controllers. The check and fault correction should only be carried out by the technician.

F0356: Collating system 1 (servo 4) disturbed

F0357: Collating system 2 (servo 5) disturbed

F0358: Blank feed (servo 6) disturbed

F0359: Folding station (servo 7) disturbed

F0360: Film cutting station (Servo 8) disturbed

F0361: Film cutting (servo 9) disturbed

F0362: Conveyor in film wrapping station (servo 10) disturbed

F0363: Film wrapping station (servo 11) disturbed

F0381: Transport conveyor before wrapping machine (servo 29) disturbed
F0390: Overload bleeder module servo drives and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Control Enclosure. The machine will not start. The bleeder of the Indramat control units has been overloaded by frequently switching on and off the machine. The bleeder is used in order to remove the voltage in the intermediate circuit of the Intramat control unit. The bleeder is located on the left side of the Indramat control unit. Check the two LED displays. Fault message for service technician.

<table>
<thead>
<tr>
<th>LED flashing green</th>
<th>The voltage supply is o.k., the voltage of the intermediate circuit is _50V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green LED is lit constantly</td>
<td>Temperature pre-warning of the internal cooler element</td>
</tr>
<tr>
<td>Red flashing LED</td>
<td>Overload, overtemperature, internal fault</td>
</tr>
<tr>
<td>Red LED is lit constantly</td>
<td>The red LED extinguishes when the overload or the overtemperature have been removed.</td>
</tr>
</tbody>
</table>

F0395: Curve Calculation Fault Servo 3 – Blank separation The machine does not start. Fault message for the service engineer. Error of curve calculation. The technician is recommended to detect the kind of the error of curve calculation:

- Actuate in the menu „Special functions 1“ the pushbutton „Page selection” next to „Machine status /machine diagnosis“.
- The menu „Machine conditions” appears on the screen.
- Actuate in the menu „Machine conditions” the pushbutton „Page selection” next to „PPC -Diagnosis“.
- The menu „PPC Diagnosis” appears on the screen.
- The menu with the status messages of the axes is indicated on the screen.
- Actuate in the menu „PPC diagnosis” the pushbutton „Next page“ in order to compare the error code with the description.
- The axis errors are indicated.
- Determine the fault by help of the error codes and description.
- Actuate the pushbutton „Previous page” (2x) in order to return to the menu „Machine conditions”.
- Actuate the pushbutton „Previous function plane” in order to return to the menu „Special functions 1”.

F0396: Curve Calculation Fault Servo 4 - Collating system

F0400: Curve Calculation Fault Servo 8 - Film station

F0401: Curve Calculation Fault Servo 9 - Film cutting

F0403: Curve Calculation Fault Servo 11 - Film wrapping

F0405: Curve Calculation Fault Servo 13

Possible cause Range error with curve calculation
A parameter for the curve violates the admissible values range (for example, negative value). Remedy:
Correct the values with KHS Kisters' support.

**Curve does not match a cycle**
Possible cause
The parameters describe a curve, which cannot be traced anymore over 360 degrees.
Correct the values with KHS Kisters' support.

**Maximum drive speed exceeded**
Possible cause
The maximum speed of the servodrive is limited. The indicated values, however, are exceeded compared to the specified maximum machine speed of the servodrive.
Remedy: Correct the values with KHS Kisters' support. If required, reduce the maximum machine speed for this format.

**Maximum drive acceleration exceeded**
Possible cause
The maximum acceleration of the servodrives is limited. The indicated values, however, are exceeded compared to the specified maximum machine speed of the servodrive.
Remedy: Correct the parameter with KHS Kisters' support. If required, reduce the maximum machine speed for this format.

**Maximum drive deceleration exceeded**
Possible cause
The maximum drive deceleration of the servodrives is limited. The indicated values, however, are exceeded compared to the specified maximum machine speed of the servodrive.
Remedy: Correct the parameter with KHS Kisters' support. If required, reduce the maximum machine speed for this format.

**Sign error with curve calculation**
Possible cause
The curve has segments with negative velocity. Remedy: Correct the values with KHS Kisters' support. If required, reduce the maximum machine speed for this format.
F0513: Metering band loose product frequency inverter fault

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Control Enclosure. Machine will not start or, if it is running, it will stop. Fault message for service technician. The “Ready” signal for the “Yaskawa” control module for the metering band is absent. When the fault has been cleared, restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intermediate circuit voltage absent, Check mains cut-out contactor and fusing. mains control cut-out contactor tripped</td>
<td>Check mains cut-out contactor and fusing.</td>
</tr>
<tr>
<td>Emergency stop button operated, pre-start requirements switched out.</td>
<td>Release emergency stop button. Switch on pre-start requirements by means of the button “PRE-START - ON”.</td>
</tr>
<tr>
<td>Power supply defective.</td>
<td>Check fusing; see manual</td>
</tr>
</tbody>
</table>

F0514: Metering band packs 1 frequency inverter fault

The machine stops immediately or does not start. Fault message for the service engineer. The message “Ready for operation” of the „Danfoss controller” for the metering band is missing. After eliminating the fault, actuate the pushbutton „CLEAR FAULT” and start the machine with the pushbutton „MAIN DRIVE ON”.

F0515: Metering band packs 2 frequency inverter fault

F0516: Metering band packs 3 frequency inverter fault

F0517: Metering band packs 3 frequency inverter fault

F0518: Overload contactor metering band loose product tripped

The machine stops immediately or does not start. Fault message for the service engineer. The motor cutout of the metering band „Loose product” has reacted.
F0519: Overload contactor metering band packs 1 tripped  
The machine stops immediately or does not start.  
Fault message for the service engineer.  
The motor cutout of the metering band „Loose product” has reacted.

F0520: Overload contactor metering band packs 2 tripped

F0521: Overload contactor metering band packs 3 tripped

F0522: Overload contactor metering band packs 4 tripped

F0545: Feed band frequency inverter fault  
See the fault code F0513, but here referring to the feed band.

F0561: Product and blank not synchronized 1  
and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Overhead Pusher Chain Section. The machine stops. A product group or a tray is absent within a machine cycle. Either insert tray or remove product group or remove tray. Restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.) Dirty photo-electric sensors, and reflectors</td>
<td>Clean sensor lenses and reflectors.</td>
</tr>
<tr>
<td>b.) Trays can not be extracted from the magazine</td>
<td>Adjust the magazine side guides.</td>
</tr>
<tr>
<td>c.) Tray or product group has been removed</td>
<td>Insert tray or product group.</td>
</tr>
</tbody>
</table>
F0562: Product and blank not synchronized

and red flashing fault location in the machine graphics - push bar chain. The machine stops. Product group or blank is missing in a machine cycle. Remove the product group or blank. Actuate the pushbutton „CLEAR FAULT” and start the machine with the pushbutton „MAIN DRIVE ON”.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contaminated light barriers, light scanners and reflectors</td>
<td>Clean the light barriers or scanner optics.</td>
</tr>
<tr>
<td>Blanks cannot be taken out of the magazine.</td>
<td>Adjust the lateral guiding rails in the magazine.</td>
</tr>
<tr>
<td>Blank or product group has been taken out.</td>
<td>Replace the product group or blank.</td>
</tr>
</tbody>
</table>

F0563: Blank not correct in Tray Transport

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - tray feed. The machine stops. A tray has slipped over a tray pusher at the tray feed chain within a machine cycle. The tray was not correctly extracted from the tray magazine and placed oblique onto the tray feed chain. Check extraction mechanism and settings of the cams which control the switch on / off sequence of the vacuum. Set the tray correctly in front of the tray pusher. When the fault has been cleared the machine can be restarted by first operating the button “FAULT RESET” and then the button “MAIN DRIVE ON”.

F0564: Fallen Product - Collating Section

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Overhead Pusher Chain Section. The machine stops. Product or products have fallen over at exit from collating system. Incorrectly collated product group. Side guide spacing not correct, product stream exerting excessive pressure on collating system. Products sticking together. Right the products and arrange the product group correctly. Check conveyor crossover bridging and the side guide spacing. When the fault has been cleared, restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Products have been forced through the collating system.</td>
<td>Reduce product pressure on the collating system by pressure exerted by product stream.</td>
</tr>
<tr>
<td>Dirty sensor lens and/or reflector will cause fault to be signalled although none exists</td>
<td>Clean sensor lens and reflector.</td>
</tr>
</tbody>
</table>
F0565: Overload
contactor vacuum pump tripped

The machine stops immediately or does not start.
Fault message for the service engineer.
Motor cutout for the metering band „Loose product“ has reacted.

F0566: Fallen
Product -Overhead Pushers

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Overhead Pusher Chain Section. The machine stops. Product or products have fallen over in the overhead pusher bar section. Dirty conveyor bridging plate, product side guide spacing incorrect. Right the products and arrange the product group correctly. Check conveyor crossover bridging and the side guide spacing. When the fault has been cleared, restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

### Possible Cause
Dirty sensor lens and/or reflector will cause fault to be signalled although none exists
The surface of the “dead plate” is dirty or is not smooth enough.
The product side guides are wrongly spaced.

### Clearing the Fault
Clean sensor lens and reflector.
Clean and smooth down the “dead plate” surface.
Check guide spacing.

F0567: Overhead pusher 1 overload clutch tripped

and red flashing information location in the machine graphics - push bar chain. The machine stops. The overload clutch of the overhead pushbar chain behind the parting system has reacted. The product groups were not correctly parted, since the backpressure is too high. Take out the releasing products and associated blank. The clutch engages through manual movement of the chain in running direction. Actuate the pushbutton “CLEAR FAULT” and start the machine with the pushbutton “MAIN DRIVE ON”.

### Possible Cause
Guiding rails of the transport chain: Supports are contaminated or bent.
The products are pressed behind the parting tools.

### Clearing the Fault
Clean and align the guiding rails.
Reduce the backpressure of the products to the parting system.
**F0568: Overhead pusher overload alarm**

Failures and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Overhead Pusher Chain Section. The machine stops. A section of the chain runner guides has been lifted by the stretching of the chains when a pusher bar is blocked by a badly collated product group. Bad product collation may be due to products being forced through collating pins by excessive pressure being exerted by the product stream. Raise chain guide by means of the black handle, remove the affected products and then lower the chain guide back into place. Remove the associated tray-blank so as to avoid a subsequent “asynchronous” fault. Restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>The guide rails of the conveyor chain supports are dirty or bent.</td>
<td>Clean sensor lens and reflector.</td>
</tr>
<tr>
<td>Products have been forced past the collating pins.</td>
<td>Clean and smooth down the “dead plate” surface.</td>
</tr>
<tr>
<td>Products are sticking to one another.</td>
<td>Check guide spacing.</td>
</tr>
</tbody>
</table>

**F0569 Fault - Double tray**

Failures and red flashing information related location in the graphical representation of the machine on the operator’s control panel - tray Feed Chain Section. The machine stops. Two or more trays stuck together are being carried forward by a pusher on the tray feed conveyor chain. Remove the excess trays. Restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trays stuck together by “fringing” along roughly cut edges.</td>
<td>Before a block of trays is loaded it should be fanned out in order to separate the blanks.</td>
</tr>
<tr>
<td>Trays have irregular widths.</td>
<td>Before blanks are loaded into the machine put those of a non-standard width to one side. When enough non-standard trays have been collected to make it worthwhile the magazine can be adjusted to suit the different width and the collected trays can be processed.</td>
</tr>
<tr>
<td>Due to poor stamping out of the blanks bits of board are left projecting beyond the tray edges and these can actuate the proximity switch. a.)</td>
<td>Rip off the projecting bits of board – best done before the blanks are loaded into the machine.</td>
</tr>
</tbody>
</table>
F0594: Product detection for gluing not OK

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Tray Folding Chain Section. The machine stops. If the lens or reflector of the sensor for detecting a product group to initiate the glue application is dirty then this could cause a false fault message to be shown. Sensor and/or reflector may be badly positioned. The sensor may be defective. Sensor lens and reflector should be cleaned. A check should be made on the positioning of the sensor and its reflector. When the fault has been cleared, restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor lens dirty</td>
<td>Clean the lens.</td>
</tr>
<tr>
<td>Reflector dirty</td>
<td>Clean the reflector.</td>
</tr>
<tr>
<td>Sensor and reflector not correctly positioned.</td>
<td>Rectify positioning as necessary and check that the sensor is working properly. Observe sensor indicator colour change.</td>
</tr>
<tr>
<td>Sensor defective.</td>
<td>Exchange sensor.</td>
</tr>
</tbody>
</table>

F0595: Adhesive temperature too low

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Tray Folding Chain Section. The machine stops immediately. Whilst the machine is running the temperature of the hot-melt adhesive has dropped below the required working temperature. Check the hot-melt adhesive unit and its power supply. When all seems to be in order switch on the unit and allow it to heat up. Operate the button “FAULT RESET”. The information message changes to “Adhesive temperature too low”. When the information message disappears from the screen it means that the adhesive has reached its working temperature, restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply absent.</td>
<td>Switch on the power supply and wait until the adhesive reaches its working temperature. Check the time switch.</td>
</tr>
<tr>
<td>Automatic fuse tripped.</td>
<td>Check reason for fuse tripping and rectify. Switch in fuse.</td>
</tr>
<tr>
<td>Heating element defective.</td>
<td>Exchange element - observe maker’s maintenance instructions !</td>
</tr>
<tr>
<td>Thermostat wrongly set.</td>
<td>Set according to adhesive specification - see manufacturer’s instructions.</td>
</tr>
<tr>
<td>Hot-melt unit not switched on.</td>
<td>Switch on the hot-melt unit. Also see Operating Instructions of the hot-melt unit.</td>
</tr>
</tbody>
</table>
F0596: Product incorrect - folding chain

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Tray Folding Chain Section. The machine stops. Products have fallen out of the tray or products have fallen into the space between two pairs of folder/pusher chain attachments. Check the tray concerned. Remove the products and tray. Restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Folding chain spacing not correct</td>
<td>Check chain spacing.</td>
</tr>
<tr>
<td>Whilst the tray walls are being folded the products fall out of the tray.</td>
<td>Check the spacing of the tray side guides.</td>
</tr>
<tr>
<td>The first folding score line on the tray-blank does not meet up with the lower front edge of the product group.</td>
<td>Check the timing of the tray-blank feed chain.</td>
</tr>
<tr>
<td>The tray-blank material is either too stiff or too floppy.</td>
<td>Check tray-blanks.</td>
</tr>
</tbody>
</table>

F0597: Rotary tab folder overload clutch tripped

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Tray Folding Chain Section. The machine stops. The rotary tab folder overload clutch has disengaged. Malformed products, products have fallen out of tray. Remove affected products and tray. Re-engage clutch by manually turning rotary folders in running direction until clutch engages. Restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotary folders not correctly spaced apart to suit width of tray.</td>
<td>Check spacing.</td>
</tr>
<tr>
<td>The side tray wall pressing arms are not spaced the right distance apart.</td>
<td>Check spacing.</td>
</tr>
</tbody>
</table>
F0599: Tray Wall
Check actuated

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Tray Folding Chain Section. The machine stops. One or both of the side tray walls have sprung open because of bad gluing. Fault in the adhesive application system, adhesive tank empty, poor quality trays - the outer paper layer has come away from the inner corrugated board layer. Remove tray and products. Restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot-melt adhesive tank empty.</td>
<td>Replenish tank with adhesive granulate and wait until the working temperature has been reached.</td>
</tr>
<tr>
<td>Poor quality tray-blanks - the outer paper layer has come away from the inner corrugated board layer.</td>
<td>Try using a new batch of trays and report to supervisor</td>
</tr>
<tr>
<td>Too low a hot-setting glue application quantity</td>
<td>Try increasing the relevant value in the control</td>
</tr>
</tbody>
</table>

F0600: Product incorrect folding section 1

and red flashing information location in the machine graphics - folding chain. The machine stops. The products fell off the blank or products fell into the space between two folding push bars. Inspect the blank. Remove the products and blanks. Actuate the pushbutton “CLEAR FAULT” and start the machine with the pushbutton “MAIN DRIVE ON”.

F0602: Carton not correctly glued

and red flashing information location in the machine graphics – the machine runs out. The machine stops. The cardboard bracket is poorly glued. Faults in the hot-setting glue system. Hot-setting glue tank is empty, too low a hot-setting glue quantity. Poor quality of the blanks, the upper paper layer gets loose. Remove the blank and products. Actuate the pushbutton “CLEAR FAULT” and start the machine with the pushbutton “MAIN DRIVE ON”.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot-setting glue tank is empty.</td>
<td>Refill hot-setting glue granulate and wait until the operating temperature has been reached.</td>
</tr>
<tr>
<td>Too low a hot-setting glue application quantity</td>
<td>Enter higher values in the V-value (cams, value for “Duration”).</td>
</tr>
<tr>
<td>Hot-setting glue spray heads are not fully working properly - for example, nozzles clogged.</td>
<td>Inspect the hot-setting glue spray heads. If required, clean or replace.</td>
</tr>
<tr>
<td>Poor quality of the blanks, the paper layer gets loose.</td>
<td>Replace the blanks.</td>
</tr>
</tbody>
</table>
F0603: Product incorrect gluing section

and red flashing information location in the machine graphics - hot-setting glue station. The machine stops. The blank with the products has been pressed to the top with folding. Re-arrange the products and inspect the blank or remove blanks and products. Actuate the pushbutton “CLEAR FAULT” and start the machine with the pushbutton “MAIN DRIVE ON”.

F0604: Product detection gluing 1 not OK

and red flashing information location in the machine graphics - folding chain. The machine stops. The sensor or/and reflector of the sensors for the product detection of the hot-setting glue application mechanism may be contaminated. Sensor or/and reflector are not in their proper positions. Defect sensor. Clean the sensor and reflector. Inspect the position of the sensor. When the fault has been eliminated, actuate the pushbutton “CLEAR FAULT” and start the machine with the pushbutton ”MAIN DRIVE ON”.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor lenses contaminated</td>
<td>Clean</td>
</tr>
<tr>
<td>Reflector contaminated</td>
<td>Clean</td>
</tr>
<tr>
<td>Sensor and reflector incorrectly positioned</td>
<td>Adjust and take function test. Observe the colour change of the displays on the sensor.</td>
</tr>
<tr>
<td>Sensor defect</td>
<td>Replace</td>
</tr>
</tbody>
</table>

F0605: Product detection gluing 2 not OK

See fault code F0604.

F0625: Film station.: Sensor print mark sensing incorrect

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - film feed section. Machine stops. Sensor lenses may be dirty. Sensor may out of position. Sensor sensitivity may be varying too much. The sensor may be defective. Restart the machine by first pressing the “FAULT RESET” button. Before restarting the machine go through a film threading sequence. See fault code F0629.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor lenses may be dirty</td>
<td>Clean lenses</td>
</tr>
<tr>
<td>Sensor may be out of position</td>
<td>Reposition the sensor</td>
</tr>
<tr>
<td>Sensor sensitivity not correctly set</td>
<td>Reset sensitivity &lt;see Section “Film Feed and Wrapping Section”</td>
</tr>
<tr>
<td>Defective sensor</td>
<td>Replace sensor (adjust sensitivity)</td>
</tr>
</tbody>
</table>
F0626: Film wrap bar overload clutch tripped

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Film Wrap Check. The machine stops. The “electronic” overload clutch of the film wrapping drive (Multibar) has tripped. There are fallen products, heavily static charged film - film has clung to a wrapping bar.

- Remove products and piece of film.
- for freeing the products use the lever
- insert lever in a hole of the cone at the driven shaft of the multi bar system
- after freeing restore lever
- Operate button “FAULT RESET”.
- Start from the “Production” menu
- In the “Production” menu touch the screen button “Synchronize Machine”.
- The ”MachineSynchronisation” menu appears on the monitor screen.
- Touch the “Function Off” button “Film wrapping system” and keep the button pressed.
- The film wrapping section moves to its “Synchronized Position” and then it stops. Stop touching the screen button.
- The colour field next to the “Function On” button changes to green
  - Touch the screen button ”Previous screen”
  - The “Production” menu appears on the monitor screen.
  - Restart the machine by operating the button “MAIN DRIVE ON”

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Products have fallen over.</td>
<td>Remove products and piece of film.</td>
</tr>
<tr>
<td>Film not properly cut.</td>
<td>Check film cutting station. The film must be drawn off the reel smoothly -no wrinkles and according to the film web run diagram.</td>
</tr>
<tr>
<td>Cut film piece not properly positioned Check film cutting station and the under the product group.</td>
<td>Check film cutting station and the compressed air jet bars. WEAR PROTECTIVE GLOVES !!!</td>
</tr>
<tr>
<td>Film has heavy static charge.</td>
<td>Check the anti-static equipment and the positioning of the anti-static rods. If all is well but problem persists then replace film reel.</td>
</tr>
<tr>
<td>Wet film.</td>
<td>Remove the piece of wet film. Do not use water, especially not a water hose, to clean down the film cutting and feeding station.</td>
</tr>
<tr>
<td>Film wrapping bar not properly positioned. The bars must be below the film retaining straps clipped in place.</td>
<td>The bars must be below the film retaining straps.</td>
</tr>
</tbody>
</table>
**F0627: Film Wrap Check actuated**

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Film Wrap Check. The machine stops. Fault during the film wrapping process. Undesirable film characteristic - wetness, high static charge on film, too old, film feed bands dirty. Film wrap sensor sensitivity wrongly set. Remove products and film if present. Restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>High static charge on film.</td>
<td>Check anti-static unit and ionisation rods.</td>
</tr>
<tr>
<td>Film is too old.</td>
<td>Exchange reel and report to supervisor for eventual check of storage arrangements,</td>
</tr>
<tr>
<td>Wet film.</td>
<td>Check reel.</td>
</tr>
<tr>
<td>Film has wrapped itself around the film cutting knife.</td>
<td>Carefully remove the film from the knife. +++ WEAR PROTECTIVE GLOVES+++</td>
</tr>
<tr>
<td>Because of its poor quality the film has “concertinated” before the knife</td>
<td>Exchange film reel.</td>
</tr>
<tr>
<td>Compressed air pressure unsteady</td>
<td>Check compressed air supply.</td>
</tr>
<tr>
<td>Grease, oil or some other liquid on the film feed bands.</td>
<td>Clean the bands with soap suds</td>
</tr>
<tr>
<td>Film has not been correctly positioned under the product Check the functioning and position of the group.</td>
<td>Check the film cutting station. Check the functioning and position of the compressed air jet bars.</td>
</tr>
<tr>
<td>Sensor sensitivity not correctly set.</td>
<td>Adjust sensor sensitivity - see makers handbill</td>
</tr>
<tr>
<td>Varying film thickness.</td>
<td>Adjust sensor sensitivity - see the manufacturer's documentation</td>
</tr>
</tbody>
</table>
F0628: Longitudinal film slitting check actuated

and red flashing fault location in the machine graphics - film cutting station. The machine stops. The longitudinal cut of the film has not been executed. The knife is dull, not in position, not latched in proper position, film not guided through the knife, inaccurate position of the spring-operated limit switch.

Take the following actions:
1. Thread up the knife in the film by loosening the lever locking.
   - Swing away the knife.
   - Thread-up the film.
   - Swing back the knife to stop and tighten the lever locking.
2. Thread up the spring of the spring-operated limit switch between the film lanes.
3. Open the safety guard. Lower the film retainer onto the film transport band by the black lever and close the safety guard.
4. Actuate the pushbutton “CLEAR FAULT”.
5. Actuate the pushbutton “POWER MANUAL FILM ON” on the push-button field on the machine frame.
6. Actuate the pushbutton “MANUAL FILM” on the push-button field on the machine frame.
   - The film transport system starts.
7. Actuate the pushbutton “MANUAL FILM” until all the not longitudinally parted film cutoffs have been collected by the film retainer.
8. Open the safety guard.
   Lift off the film retainer from the film transport band by the black lever.
   Remove the collected film cutoffs.
   Close the safety guard.
9. Actuate the pushbutton “POWER MANUAL FILM ON” on the pushbutton field on the machine frame.
10. Actuate the pushbutton “MANUAL FILM” as frequently as necessary until productions runs faultlessly.
11. Start the machine with the pushbutton “MAIN DRIVE ON”.

F0629: Z correction not in permitted range

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Film Cutting Station. The machine stops. The printed motif on the film has not been found. Inexact printing. Print motif absent. The print motif detecting sensor above the film feed conveyor bands has not been repositioned after a format change-over has been made to a format requiring narrower film. The sensor should be repositioned to suit the different film width.

See the relevant section in the manual “format Change-over Guide”. The print position must be re-defined as described below.

- Open the safety device at the film cutting station.
- Check the last product group and the piece of film
- Remove the product group and the piece of film
- Remove the piece(s) of film on which the print mark has not been detected.
- Lower the film retaining device onto the film feed conveyor
- Close the safety device at the film cutting station.
- Operate the pushbutton “FAULT RESET”
- Operate the button “POWER MANUAL FILM ON” on the local push station near to the film reels.
- Operate the pushbutton “MANUAL FILM” on the local push station near to the film reels.
- The film feed system is started.
- The film will be cut as soon as the print mark is properly positioned again.
- Open the safety device at the film cutting station.
- Raise the film retaining device up from the film feed conveyor.
- Remove the pieces of film.
- Close the safety device at the film cutting station.
- Operate the button “POWER MANUAL FILM ON” on the local push station near to the film reels.
- Operate the pushbutton “MANUAL FILM” at the film cutting station as often as required for a faultless continuation of production.
- Operate the pushbutton “MAIN DRIVE ON”
- The machine starts

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor lens dirty</td>
<td>Clean the lens.</td>
</tr>
<tr>
<td>Sensor in the wrong position.</td>
<td>Reposition the sensor as required.</td>
</tr>
<tr>
<td>Sensor sensitivity not correctly set.</td>
<td>Reset the sensitivity</td>
</tr>
<tr>
<td>Print motif pitch on the film varies considerably or the print motif is missing.</td>
<td>Check the film to see how serious the problem is and if necessary exchange the doubtful reel for a new one.</td>
</tr>
</tbody>
</table>
F0630: Fallen product - Wrapping section

and red flashing status location in machine diagram - film wrapping system. The machine stops. Products have fallen in the film wrapping bar chain. Remove the products and the piece of film. If products got trapped under a film wrapping bar take the lever from the machine frame and insert it into the cone of the drive for the film wrapping bar chain. Turn the chain until the products are freed. Operate the push button “RESET FAULT” at the operator’s panel, start the machine by operating the pushbutton “MAIN DRIVE ON”.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product groups have not been Check the distance of the guide rails and of the guided properly.</td>
<td>Check the distance of the guide rails and of the guided properly. wedges before the film wrapping bar system.</td>
</tr>
<tr>
<td>Film not properly cut.</td>
<td>Check film cutting station. The film must be drawn off the reel smoothly -no wrinkles and according to the film web run diagram.</td>
</tr>
<tr>
<td>Cut film piece not properly positioned under the product group.</td>
<td>Check film cutting station and the under the product group. compressed air jet bars. WEAR PROTECTIVE GLOVES !!!</td>
</tr>
<tr>
<td>Film has heavy static charge.</td>
<td>Check the anti-static equipment and the positioning of the anti-static rods. If all is well but problem persists then replace film reel.</td>
</tr>
<tr>
<td>Different conveyor belt levels</td>
<td>The conveyor belts must be at the same level</td>
</tr>
</tbody>
</table>

F0631: Control film feed conveyor - film position ok?

and red flashing status location in machine diagram - film wrapping station. The machine is stopped. The vacuum fan is switched off as a result of a disruption or after the activation of the Emergency-stop pushbutton. The film section on the transport belt might have slipped backwards, due to the lack of vacuum. Inspect position of the film section on the transport belt. Remove film section, if its position is not correct. Restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

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F0632: Film welding unit: Print mark not found

and red flashing information location in the machine graphics – film welding. The pressure marks on the film have not been detected by the first pressure marks sensor. Inspect if the film has been properly threaded up between the guiding sheet-metals of the pressure mark sensors in the film welding area. Check the position and lenses of the pressure mark sensors. Set the 9-position selector switch to position 1 “1 – Reset film welding” and actuate the pushbutton “WELDING START MANUAL”. The film welding stops. Set the 9-position selector switch to position 0 “0 – Automatic operation”. After the fault has been eradicated, start the machine by pressing the pushbuttons “CLEAR FAULT” and “MAIN DRIVE ON”. 

Or

and red flashing information location in the machine graphics – film welding. The film welding is not initiated. The pressure marks on the film are not detected during the reading cycle of the pressure marks. Inspect if the film has been properly threaded up between the guiding sheet-metals of the pressure mark sensors in the film welding area. Set the 9-position selector switch to position 1 “1 – Reset film welding” and actuate the pushbutton “WELDING START MANUAL”. The film welding stops. Set the 9-position selector switch to position 0 “0 – Automatic operation”. After the fault has been eradicated, start the machine by pressing the pushbuttons “CLEAR FAULT” and “MAIN DRIVE ON”.

F0633: Film welding bar not correctly closed

and red flashing information location in the machine graphics – film welding. The machine stops. The pneumatically driven film welding bar has not reached its welding position while welding. Check the pneumatic cylinder and connectors of the pneumatic pipework. Check the rigidity and parallel operation of the cylinders. After the fault has been eradicated, start the machine by pressing the pushbuttons “CLEAR FAULT” and “MAIN DRIVE ON”. When welding is not initiated, set the 9-position selector switch to position 1 “1 – Reset film welding” and actuate the pushbutton “WELDING START MANUAL”. The film welding stops. Set the 9-position selector switch to position 2 “2 – MANUAL WELDING” and actuate the pushbutton “WELDING START MANUAL”. Manual welding is initiated. After manual welding set the 9-position selector switch to position 0 “0 – Automatic operation”.
**F0634: Dancer not in working range**

and red flashing information location in the machine graphics - dancer. The machine stops. The dancer has reached its highest position. The film is not tensioned by the dancer. Inspect the film for film cut.

Check the film mandrel brakes and the Warner“-system for amplification of the film brake. Inspect if the correct film reel has been activated.

After the fault has been eliminated, start the machine by actuating the pushbuttons “CLEAR FAULT” and “MAIN DRIVE ON”.

**F0657: Frequency inverter fault conveyor chain tunnel**

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Tunnel. The machine stops immediately and cannot be restarted. The “READY” indication from the “Yaskawa” speed regulating unit for the chain link conveyor motor is absent. After the fault has been traced and cleared, restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-circuit voltage absent. Voltage supply contactor tripped.</td>
<td>Check the voltage supply contactor and fusing.</td>
</tr>
<tr>
<td>Emergency stop button operated. Pre-start requirements switched out.</td>
<td>After reason for emergency stop has been dealt with the emergency stop button can be released. When the reason for the pre-start requirements switch-out has been dealt with switch them back in.</td>
</tr>
<tr>
<td>Power supply defective.</td>
<td>Check fusing - see “Yaskawa” manual.</td>
</tr>
</tbody>
</table>
F0660: Heated zone temperature too low

and red flashing information related location in the graphical representation of the machine on the operator's control panel - Tunnel. The machine stops immediately. During production the temperature of the tunnel has fallen below the set working temperature. Check the tunnel and its power supply. When the cause of stoppage has been found and rectified restart the tunnel. Touch the push button “RESET FAULT”. The information message will change to “Info - Tunnel - Heated zone temperature too low”. The message will disappear from the screen to indicate that the tunnel working temperature has been reached, restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply has failed.</td>
<td>Restore power supply and wait until working temperature has been reached.</td>
</tr>
<tr>
<td>Fusing dropped out.</td>
<td>Trace and rectify fault, reactivate fusing</td>
</tr>
<tr>
<td>Defective heating element.</td>
<td>Exchange heating element. Follow maker's advice on maintenance.</td>
</tr>
<tr>
<td>Improperly adjusted thermostat</td>
<td>Adjust according to shrink film specifications.</td>
</tr>
<tr>
<td></td>
<td>See the manufacturer's instructions</td>
</tr>
<tr>
<td>Tunnel not switched on.</td>
<td>Switch on tunnel.</td>
</tr>
</tbody>
</table>

F0661: Tunnel not switched on

The machine does not start. The tunnel has not been switched on. Actuate the pushbutton “CLEAR FAULT” and switch on the tunnel through the menu ”Tunnel operation”. When the operating temperatures of the heating zones have been reached, start the machine with the pushbutton “MAIN DRIVE ON”.

F0662: Heated Zone 1 temperature too high

and red flashing information related location in the graphical representation of the machine on the operator's control panel - Tunnel. The machine stops. A related temperature feeler has sensed that the temperature in one or more of the heated zones in the tunnel is too high. Heated Zone 1 is the first zone in the tunnel when viewed in the running direction, followed by zone 2. Check the related blower motors. When the fault has been traced and rectified and the affected zone or zones have cooled down to the correct working temperature actuate the “Reset” button on the temperature feeler(s). “To reset turn cap nut and press button””; then operate the button “FAULT RESET” and restart the machine by operating the button “MAIN DRIVE ON”.

F0663: Heated Zone 2 temperature too high

F0664: Heated Zone 3 temperature too high

F0664: Heated Zone 4 temperature too high
F0689: Speed compensation band frequency converter fault

see fault code F0657, but for the speed compensation band

F0705: - F0714: Frequency converter 1TK11 - 1TK20

see fault code F0657, but for the speed compensation band

F0769: Temperature sensor of the tunnel disturbed

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Tunnel. Machine does not stop. The electrical connectors or one or several temperature sensors are defective. A wire can be broken or the terminal connections are incorrect. Check the temperature sensors, connectors and before re-connection check output values. Only for technician.

F0770: Reference position Enc Main Drive not OK

Shaft angle encoder for main drive servo unit for Axis 1. Fault Message appears on screen - when first taken into service. - after the motor connections have been unmade (e.g. motor has been exchanged). The reference position has been lost. The reference position for the relevant shaft angle encoder needs to be re-established. See “General Basic Machine Settings” in the Instruction Manual.

F0771: Reference position Enc Collat. Syst. axis I not OK

Shaft angle encoder for collating system servo drive unit for Axis 4. See Fault code F0770.

F0772: Reference position Enc Collat. Syst. axis II not OK

Shaft angle encoder for collating system servo drive unit for Axis 5. See Fault code F0770.

F0773: Reference position Enc Tray Transport not OK

Shaft angle encoder for tray transport servo drive unit for Axis 6. See Fault code F0770.

F0774: Reference position Enc Folding Section not OK

Shaft angle encoder for tray folding chain servo drive unit for Axis 7. See Fault code F0770.

F0775: Reference position encoder Wrapping not OK

Shaft angle encoder for film wrapping servo drive unit for Axis 11. See Fault code F0770.
F0776: Reference position encoder
Film cutting not OK

Shaft angle encoder for film cutting servo drive unit for Axis 9. See Fault code F0770.

F1025 - F1238: Guard doors 1 - 14 opened

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Safety device. The machine will not start. The safety device XX is not closed. After the guard has been closed the machine can be started by operating the buttons "PRESTART ON" and “MAIN DRIVE ON”

Operation of protective covers
- Pull grab wire at the protective cover which is to be opened
- The light beam of a photo-electric sensor is interrupted.
- The machine is stopped with a delay.
- Open and lift safety device after the machine has come to a halt.
- Change from the upper aluminium handle to the lower handle
- Slide safety device until it is in the upper final position.

F1039: Fault Lubrication

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Tunnel. Machine stops. The warning code “W0031: Minimum machine lubricant”, W0041: Minimum machine lubricant 2 or/and “W03541: Minimum tunnel lubricant” have been ignored for more than 8 production hours. Fill up machine or/and tunnel lubricant tank immediately with Eural Hyd 68 for the machine and Fluid Klüber oil 4UH 1-220 N for the tunnel or customer-specific lubricant. When the lubricant tank has been refilled touch the button “FAULT RESET” and restart the machine by operating the button “MAIN DRIVE ON”.

F1040: Tunnel handcrank in place

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Tunnel. The machine will not start. The handcrank at the exit end of the tunnel which is used to empty the tunnel in case of a power failure is still in place on the shaft spigot. Withdraw the handcrank, close the spigot cover, restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

F1041: Positioned stop by operator

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Operator’s Control Panel or/and Machine Discharge. The machine has been stopped by the operation of the “Positioned Stop” button on the operator’s control panel or/and at the machine discharge.

F1042: Immediate stop by operator

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Operator’s Control Panel. The machine has been stopped by the operation of the “Immediate Stop” button on the operator’s control panel.
F1043: Photo electric sensor
Immediate Stop
constantly actuated

Fault message appears, the machine does not start. One or more grab wires at the safety guards are constantly actuated. Remove the cause of the actuation. Start the machine.

F1044: No program selected or program was changed

The “Start”-screen is shown of the monitor screen. The machine not in production.

F1045: Key switch
'Packer Power Supply On / Off’ - OFF

and red flashing information related location in the graphical representation of the machine on the operator's control panel. During production the (keyed) selector switch “POWER PACKER ON / OFF” is set to position “OFF”. The machine comes to “no controlled stop”. Set (keyed) selector switch “POWER PACKER ON / OFF” to position “ON”. The message disappears. Operate pushbutton “FAULT RESET”. Check further fault messages and rectify. Start the machine by operating the buttons "PRE-START ON" and "MAIN DRIVE ON”.

F1046: Tunnel not switched on

and red flashing information related location in the graphical representation of the machine on operator’s control panel - Tunnel. Klaxon sounds. The machine will not start. The tunnel has not been switched on. Service switch (repair switch) of the tunnel chain drive is not switched on. Operate the push button “FAULT RESET” and start the tunnel through the menu “FunctionEnable!” (see above). When the tunnel reaches its working temperature, restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

F1153: 'Pre-Start On’ not operated

Operate the illuminated push-button “PRE-START ON” on the operator’s control panel. The message disappears and the illuminated push-button lights up. Start the machine by operating the button “MAIN DRIVE ON”.

F1154: 'Main Drive On’ not operated

The illuminated push-button “PRE-START ON” on the operator’s control panel is lit up. There are no other information or fault messages being shown. The machine can be started by operating the button “MAIN DRIVE ON”.

F1156: Collating system disabled by operator

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Operator’s Control Panel. The collating system has been stopped by the operation of the “Collating System disabled / enabled” selector on the operator’s control panel.
F1157: Minimum blanks - Blank Feed

The blue segment of the pillar signal lamp blinks. The collating system is deactivated. The blank magazine is almost empty. Fill up the blank magazine:

- The blanks have to be placed in the blank magazine as shown in the sketch below
- Blank print to the right
- Arranging the stack of blanks between the side guide rails.
- Long side on the floor of the blank magazine.
- Push the support angle plate up against the back of the line of blanks in running direction.

F1161: Low temperature - Adhesive

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Hot-Melt Adhesive Unit. The machine will not start. The hot-melt adhesive has not reached its working temperature. Switch on the hot-melt adhesive unit, wait until the adhesive reaches its working temperature. Watch the indicators on the unit. When the adhesive reaches its working temperature the information message disappears from the screen and the machine can be started by operating the button “MAIN DRIVE ON”.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>No power supply</td>
<td>Switch on power supply and then wait until working temperature is reached.</td>
</tr>
<tr>
<td>Fuse tripped</td>
<td>Find and rectify fault that caused fuse to trip and reset fuse.</td>
</tr>
<tr>
<td>Heating element defective</td>
<td>Exchange heating element. Make sure that the recommended maintenance procedures are being observed.</td>
</tr>
<tr>
<td>Thermostat falsely set.</td>
<td>Set according to adhesive specification – see manufacturer’s guidance notes.</td>
</tr>
</tbody>
</table>

F1162: Minimum - Hot-Melt

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Hot-Melt Adhesive Unit. Blue segment of the pillar signal lamp blinks. Hot-melt adhesive tank is almost empty.

- Fill up the tank up to 2cm below the top of the tank.
- Fill the hot-melt adhesive tank step by step. Always fill in small amounts of hot-melt granulate and wait until the granulate is molten

**WARNING:**

Do not put your hands into the hot-setting glue tank, danger of burning !!!!!
Wear protective gears and glasses!

- Close the tank cover.
- Close the hot-setting glue granulate container.
F1163: Film end - Reel 1

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Film Reels. The film on the reel being used is almost exhausted. The machine speed drops to a lower level. The machine does not stop. The blue segment of the pillar signal lamp blinks.

- Operate the push-button “ACKNOWLEDGE END OF FILM”
- Watch over the subsequent film feed section.

If after the operation of the push-button “ACKNOWLEDGE END OF FILM” a fault occurs then the machine stops. Clear the fault, operate the push-button “FAULT RESET” and follow this by operating the button “MAIN DRIVE ON”. An inhibit is applied to the machine so it does not start.

Operate the push-button “ACKNOWLEDGE END OF FILM”. The machine starts. The operator must then stop the machine by operating the push-button “POS. STOP” shortly before the actual end of the film is reached. Change over to the other film reel. The blue segment of the pillar signal lamp is extinguished after the last operation of the push-button “ACKNOWLEDGE END OF FILM”.

On the next pages the required procedures are described for
- changing the film reels
- welding the film ends
- threading the film

F1165: Service switch metering band off

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Feed band. The Machine should not be started. Service switch (repair switch) of the metering band is not switched on. Switch on service switch near to the motor and start the machine in the usual way.

F1166: Service switch feed band 1 off

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Feed band. The Machine should not be started. Service switch (repair switch) of the feed band I is not switched on. Switch on service switch near to the motor and start the machine in the usual way.

F1167: Service switch feed band 2 off

The machine does not start. The service switch (repair switch) of the feed band II has not been engaged. Engage the service switch and start the machine as usual.

F1172: Service switch speed compensation band off

The machine does not start. The service switch (repair switch) of the speed compensating band has not been engaged. Engage the service switch next to the motor of the speed compensating band and start the machine as usual.

F1193: Conveyor system switched off

The downstream installed band assembly is not active, no production possible.
F1194: Emergency stop conveyor system operated

The machine has been shut off due to an emergency situation by the emergency ALL-OFF switch at the band assembly.

→ see F1281

F1201: F1210: Service switch off
1TK11 - 1TK20

See the fault code F1172, but for the service switch of the indicated band of the band assembly.

F1281: Emergency Stop control panel operated

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Operator’s Control Panel. In response to a critical situation the machine has been stopped by the operation of the emergency stop button on the operator’s control panel. The tunnel should be emptied as quickly as possible.

• Pull the lever with black round knob at the tunnel discharge and turn it downwards.
• The opening for the handcrank is freed
• Place the handcrank onto the journal of the drive shaft of the tunnel conveyor
• Turn the handcrank in running direction until all products have left the film shrink tunnel
• Take off the handcrank
• Pull the lever with black round knob at the tunnel discharge and turn it upwards into horizontal position.
• The opening for the handcrank is blocked.

Before the machine is started the machine sections should be checked. The emergency situation must be dealt with as necessary. The operated emergency stop button needs to be released either by pulling out the mushroom headed button or by turning the locking key. Operate illuminated button “PRE-START ON” and restart machine by operating the buttons “FAULT RESET” and “MAIN DRIVE ON”

F1286: Emergency stop film wrapping operated

F1287: Emergency stop "internal" operated

F1313: Communication in the line disturbed

The communication is monitored by a “Watchdog”. If within a certain time there is no exchange of data then when this fact is signalled the info message appears on the monitor screen. Fault message for service technician. The relevant cabling, connections and the “Ethernet Card” must be checked. See Section 13. When the fault has been cleared operate the push button “FAULT RESET”. The fault message disappears and the communication is resumed. Restart the machine in the usual way.
F1314: Compressed air supply not OK

Machine will not start or, if it is already running, it will stop. The compressed air supply pressure has dropped below the required value. Check that the supply valve has been fully opened, verify the manometer reading. When all is in order and a pressure of about 6 bar has been reached, restart the machine by operating the button “FAULT RESET” and button “MAIN DRIVE ON”.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand valve not fully open.</td>
<td>Fully open the hand valve.</td>
</tr>
<tr>
<td>Main supply valve not opened.</td>
<td>Call for main supply valve to be opened.</td>
</tr>
<tr>
<td>Pressure drops below 4 bar.</td>
<td>Check compressed air lines for leaks.</td>
</tr>
<tr>
<td></td>
<td>If mains supply pressure has dropped then report to responsible person.</td>
</tr>
</tbody>
</table>

F1315: - F1316: Max. discharge 1 / 2

and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Machine discharge. Machine stops and the warning klaxon sounds. A build-back of products has developed on the discharge conveyor after the machine or on the downstream conveyor. Could be due to jammed products or the following machine in the line has stopped. Free the jammed products or wait until the following machine restarts. When the klaxon stops sounding touch the screen button “FAULT RESET” and restart the machine by operating the button “MAIN DRIVE ON”.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Clearing the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jammed products.</td>
<td>Free jammed products.</td>
</tr>
<tr>
<td>Conveyors or machine stopped by signal from an external source.</td>
<td>Wait until conveyors or machine is started by signal from an external source. External signal.</td>
</tr>
</tbody>
</table>

F1318: Positioned Stop - External actuated

After a time delay the machine stops. The machine is brought to a defined stop position by a signal from an external source. When the message has disappeared the machine can be restarted by operating the button “MAIN DRIVE ON”.

F1441: Collating system disabled external

The collating system has stopped by a signal from an external source. When the message has disappeared the collating system restarts automatically.
**F1442: Product feed not correct**  
and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Product Feed. Blue segment of the pillar signal lamp blinks. Feed band, blank feed and collating system stop. Shortage of products before the collating system or fallen product on the feed band. Straighten up and arrange products correctly. Turn and hold the switch “ENABLE FEED BAND / COLLATING SYSTEM” to “FEED BAND”. The feed band starts and stops again when the switch is released. Gaps in product feed are filled. Turn and hold the switch “ENABLE FEED BAND / COLLATING SYSTEM” to “COLLATING SYSTEM”. The blank feed, feed band and collating system start to run.

**F1443: Improper compressed air supply**  
The machine stops or does not start. The compressed air supply for the blank magazine works with less pressure as the nominal value should be. Switch on the compressed air supply. Inspect the black manual valve on the compressed air connector. Watch the pressure gauge. When the pressure of approximately 6 bar has been reached, actuate the pushbutton „CLEAR FAULT“ and start the machine with the pushbutton „MAIN DRIVE ON”.

**F1444: Stop by preceding machine**  
After a time delay the machine stops. The machine is stopped by a signal from the preceding machine. When the information message has disappeared the machine restarts automatically.

**F1445: Control cut-out externally activated**  
After a time delay the machine stops. The machine is stopped in controller inhibit cut-out by a signal from an external source. When the message has disappeared the machine restarts automatically.

**F1569: Minimum product**  
and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Product Feed. The product feed and collating system stop. There is a shortage of products before the collating system or on the product feeding conveyors. Wait until the supply of products resumes and the feed conveyors are filled up again. Once there are sufficient products the collating system restarts automatically.

**F1601: Build-back - External actuated**  
and red flashing information related location in the graphical representation of the machine on the operator’s control panel - Machine discharge. The machine comes to a delayed stop. The machine has been stopped by a signal from an external source because a product back-up has been detected. As soon as the message disappears from the screen the machine can be restarted by operating the button “MAIN DRIVE ON”
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<td>7.2</td>
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<td>7.2.1</td>
<td>4</td>
</tr>
<tr>
<td>7.2.2</td>
<td>5</td>
</tr>
</tbody>
</table>

Separate documentation
7 Technical Data

7.1 Identification

<table>
<thead>
<tr>
<th>Type</th>
<th>TSP Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year of manufacture</td>
<td>2008</td>
</tr>
<tr>
<td>Order / Machinen number</td>
<td>K-89402082-000100</td>
</tr>
<tr>
<td>Performance</td>
<td>Max.40 Takte / min</td>
</tr>
<tr>
<td>Type of package</td>
<td>Trays with film wrapping and shrinking</td>
</tr>
<tr>
<td>Packing material</td>
<td>B-Flute and shrinkable film, see specificationes</td>
</tr>
<tr>
<td>Traymagazin</td>
<td>Max. 1200 Stück</td>
</tr>
<tr>
<td>Film rollers</td>
<td>Max. ø 450 mm</td>
</tr>
<tr>
<td>Packages</td>
<td>See format change over guide</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>&gt;=5 C &lt;=35 C</td>
</tr>
<tr>
<td>Max. Humidity</td>
<td>75%</td>
</tr>
<tr>
<td>Working height</td>
<td>1250 +/- 50 mm</td>
</tr>
<tr>
<td>Control</td>
<td>SPS Siemens S7</td>
</tr>
<tr>
<td>Electrical connection</td>
<td>3/N/PE ~ 50 Hz 380V</td>
</tr>
<tr>
<td>Control voltage</td>
<td>24V DC</td>
</tr>
<tr>
<td>Electrical performance</td>
<td>131 kVA</td>
</tr>
<tr>
<td>Max. fuses in supply</td>
<td>Max. 250A träge/slow</td>
</tr>
<tr>
<td>Variation</td>
<td>+5% / -5%</td>
</tr>
<tr>
<td>Pneumatic connection</td>
<td>Connection:1/2&quot;, 13mm</td>
</tr>
<tr>
<td></td>
<td>Min. / Max. air-pressure 6 / 8 bar</td>
</tr>
<tr>
<td></td>
<td>min. Air Quantity: 8 lt / cycle</td>
</tr>
</tbody>
</table>
### 7.2 Dimensions and Weight

<table>
<thead>
<tr>
<th></th>
<th>netto</th>
<th>brutto</th>
<th>Length x Width x Height in cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packer Part 1</td>
<td>ca. 5100 kg</td>
<td>ca. 5150 kg</td>
<td>820x205x235</td>
</tr>
<tr>
<td>Packer Part 2</td>
<td>ca. 3600 kg</td>
<td>ca. 3640 kg</td>
<td>520x205x235</td>
</tr>
<tr>
<td>Control cabinet</td>
<td>ca. 750 kg</td>
<td>ca. 850 kg</td>
<td>330x110x225</td>
</tr>
<tr>
<td>Infeed conveyor</td>
<td>ca. 1900 kg</td>
<td>ca. 2210 kg</td>
<td>420x220x190</td>
</tr>
<tr>
<td>Shrink tunnel</td>
<td>ca. 4350 kg</td>
<td>ca. 4400 kg</td>
<td>550x210x245</td>
</tr>
</tbody>
</table>
## 7.2.1 Sort

<table>
<thead>
<tr>
<th>No.</th>
<th>Product</th>
<th>Form</th>
<th>Material</th>
<th>Input layout</th>
<th>Output layout</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Can</td>
<td>Steel / Alu</td>
<td>66 / 115 / 330</td>
<td>Single products</td>
<td>6 x 4</td>
<td>Tray and Film</td>
</tr>
<tr>
<td>1.2</td>
<td>Can</td>
<td>Steel / Alu</td>
<td>66 / 115 / 330</td>
<td>(3 x 2)</td>
<td>6 x 4</td>
<td>Tray and Film</td>
</tr>
<tr>
<td>1.3</td>
<td>Can</td>
<td>Steel / Alu</td>
<td>66 / 115 / 330</td>
<td>(3 x 4)</td>
<td>6 x 4</td>
<td>Tray and Film</td>
</tr>
</tbody>
</table>
## 7.2.2 Adjustment values

<table>
<thead>
<tr>
<th>MC_Number: K-89402082-000100</th>
<th>form</th>
<th>wrap</th>
<th>ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typ: TSP 40 Advanced</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>height</td>
<td>Ø</td>
<td>cont.</td>
</tr>
</tbody>
</table>

### Format:

- **M1 - 1**: adjustment for incorrect product on feed band
- **M1 - 2**: infeed band guide rail adjustment
<table>
<thead>
<tr>
<th>MC_Number K-89402082-000100</th>
<th>form</th>
<th>wrap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typ: TSP 40 Advanced</td>
<td>height</td>
<td>Ø</td>
</tr>
<tr>
<td></td>
<td>padder</td>
<td>X</td>
</tr>
<tr>
<td>M9 - 5B</td>
<td>adjustment guide rails in blank conveyor</td>
<td></td>
</tr>
<tr>
<td>M9 - 6</td>
<td>adjustment of lateral guide rails in tray blank</td>
<td></td>
</tr>
<tr>
<td>magazin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M9 - 7</td>
<td>height adjustment of blank support</td>
<td></td>
</tr>
</tbody>
</table>

Format:
<table>
<thead>
<tr>
<th>MC_Number</th>
<th>Typ: TSP 40 Advanced</th>
<th>form</th>
<th>wrap</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-89402082-000100</td>
<td>height Ø cont. ml</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>padder</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

| Format:         |                      |      |
| M2 - 1          | disassemble collating pins |
| M2 - 2          | disassemble guide rails between the conveyor chains |
| M2 - 5          | chain adjustment underneath upper flight bars |
| M2 - 7          | adjustment of guide rails above collating unit |
| M2 - 9          | assemble collating pins |
| M2 - 10         | assemble guide rails between the conveyor chains |
| M2 - 12A        | adjustment of guide rails upper flight bars |
| M2 - 12B        | adjustment of guide rails upper flight bars |
| M2 - 13A        | adjustment of guide rails upper flight bars |
| M2 - 13B        | adjustment of guide rails upper flight bars |
| M2 - 14A        | adjustment of guide rails upper flight bars |
| M2 - 14B        | adjustment of guide rails upper flight bars |
| M2 - 15A        | adjustment of guide rails upper flight bars |
| M2 - 15B        | adjustment of guide rails upper flight bars |
| M2 - 16A        | adjustment of guide rails upper flight bars |
| M2 - 16B        | adjustment of guide rails upper flight bars |
| M2 - 21         | TPFO on / off |

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Technische Daten_EN.doc 7
<table>
<thead>
<tr>
<th>MC_Number</th>
<th>Typ: TSP 40 Advanced</th>
<th>form</th>
<th>wrap</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>height  Ø cont.</td>
<td>ml</td>
<td></td>
</tr>
<tr>
<td></td>
<td>padder</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Format:</th>
</tr>
</thead>
<tbody>
<tr>
<td>M3 - 22</td>
</tr>
<tr>
<td>M4 - 1</td>
</tr>
<tr>
<td>M4 - 2A</td>
</tr>
<tr>
<td>M4 - 2B</td>
</tr>
<tr>
<td>M4 - 4</td>
</tr>
<tr>
<td>M4 - 4.1</td>
</tr>
<tr>
<td>M4 - 10</td>
</tr>
<tr>
<td>M4 - 27</td>
</tr>
<tr>
<td>Height</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>padder</td>
</tr>
</tbody>
</table>

**Typ: TSP 40 Advanced**

**Format:**

- M7 - 5 adjustment air jets
- M7 - 19 position adjustment air jets
- M7 - 20 position adjustment air jets
- M7 - 21 position adjustment air jets
- M7 - 22 adjustment air jets
CASTROL VISCOLEB™
Fully synthetic chain lubricants, physiologically safe, NSF H1 authorized

DESCRIPTION

VISCOLEB are chain lubricants especially developed to meet the requirements of the food and beverage industries. They are water-resistant and have a high load carrying capacity. VISCOLEB are tasteless and odorless oils. Special additives specifically protect from wear and prevent corrosion. VISCOLEB chain lubricants are NSF H1 authorized and therefore suited for applications where a direct exposure of the lubricated part to the edible product is possible due to technical reasons.

APPLICATIONS

- For the special requirements in the food and beverage industries where there may be direct exposure of the lubricated part to the edible product or its packaging
- For chains of production, filling and packaging machines
- For slideways, central lubrication systems, spraying systems (product consolidation)
- CASTROL VISCOLEB 32 especially for chains in the low-temperature range e.g. in frosters
- Temperature application ranges: VISCOLEB 32: - 60 °C/- 140 °F to + 150 °C/+ 302 °F
  - VISCOLEB 150: - 30 °C/- 22 °F to + 200 °C/+ 392 °F
  - VISCOLEB 280: - 30 °C/- 22 °F to + 200 °C/+ 392 °F
  - VISCOLEB 1500: - 20 °C/- 4 °F to + 200 °C/+ 392 °F

ADVANTAGES

- OPTITEC® - CASTROL OPTIMOL technology
- physiologically safe
- NSF H1 authorized
- tasteless and odorless
- transparent
- resistant to water
- compatible with mineral oil, therefore no prior cleaning of the chains when converting to VISCOLEB
- good penetration
- excellent adherence
- optimum corrosion and wear protection
NOTES FOR USE

- VISCOLEB oils are compatible with mineral oil, therefore prior cleaning of the chains is not necessary during conversion.
- However, cleaning of heavily contaminated chains is advisable in order to ensure easy penetration of VISCOLEB.
- For application in central lubrication and spraying systems please observe the specified viscosity.
- In spray cans: VISCOLEB 32 SPRAY, VISCOLEB 280 SPRAY, VISCOLEB 1500 SPRAY.

Technical data

<table>
<thead>
<tr>
<th></th>
<th>Unit</th>
<th>Value</th>
<th>Test method</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASTROL VISCOLEB</td>
<td>-</td>
<td>32</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td></td>
<td>280</td>
<td>1500</td>
</tr>
<tr>
<td>Color</td>
<td>-</td>
<td></td>
<td>transparent</td>
</tr>
<tr>
<td>Base</td>
<td>-</td>
<td></td>
<td>polyalphaolefin</td>
</tr>
<tr>
<td>ISO viscosity group</td>
<td>-</td>
<td>32</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1500</td>
</tr>
<tr>
<td>Density + 15°C/ + 59°F</td>
<td>kg/m³</td>
<td>830</td>
<td>850</td>
</tr>
<tr>
<td></td>
<td></td>
<td>850</td>
<td>870</td>
</tr>
<tr>
<td>Kin. viscosity at + 40°C/+ 104°F at + 100°C/+ 212°F</td>
<td>mm²/s</td>
<td>31.0</td>
<td>144.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.8</td>
<td>18.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>144.0</td>
<td>286.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18.6</td>
<td>30.6</td>
</tr>
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<td></td>
<td></td>
<td>286.3</td>
<td>1443</td>
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<td></td>
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<td>30.6</td>
<td>103.0</td>
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<tr>
<td>Viscosity index</td>
<td>-</td>
<td>128</td>
<td>145</td>
</tr>
<tr>
<td></td>
<td></td>
<td>145</td>
<td>158</td>
</tr>
<tr>
<td>Pour point</td>
<td>°C</td>
<td>&lt; - 60</td>
<td>- 42</td>
</tr>
<tr>
<td></td>
<td>°F</td>
<td>&lt; - 76</td>
<td>- 36</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 42</td>
<td>- 36</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 36</td>
<td>- 24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 32.8</td>
<td>- 11.2</td>
</tr>
<tr>
<td>Flash point</td>
<td>°C</td>
<td>220</td>
<td>236</td>
</tr>
<tr>
<td></td>
<td>°F</td>
<td>428</td>
<td>456.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>236</td>
<td>249.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>456.8</td>
<td>435.2</td>
</tr>
<tr>
<td>Copper corrosion protection</td>
<td>-</td>
<td>1a</td>
<td>1a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1a</td>
<td>1a</td>
</tr>
<tr>
<td>Steel corrosion protection</td>
<td>-</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

1 mm²/s = 1 cSt
1. Identification of the substance/preparation and company/undertaking

Product name: Viscoleb 150

SDS no.: 50795

Historic SDS no.: DE-07255, BE-450795, UK-3742, FR-450795, AT-3152, SE-558816, NO-558816, FI-558816, NL-450795, IT-07255, DK-450795, SI-07255, PL-7255, RU-7255, EE-7255, LT-7255, CZ-507255, BG-7255, HU-07255

Product use: Food machinery lubricant

Supplier: Deutsche BP Aktiengesellschaft
Industrial Lubricants & Services
Erkelenzer Straße 20,
D-41179 Mönchengladbach
Germany

Telephone: +49 (0)2161 909-319
Telefax: +49 (0)2161 909-392

EMERGENCY TELEPHONE NUMBER: Carechem: +44 (0) 208 762 8322

2. Composition/information on ingredients

Synthetic lubricant and additives.

This product does not contain any hazardous ingredients at or above regulated thresholds.

3. Hazards identification

This preparation is not classified as dangerous according to Directive 1999/45/EC as amended and adapted.

Effects and symptoms:

- **Eyes**: May cause mild eye irritation.
- **Skin**: Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis. Spots and aerosol may produce mucus membrane, nose, and throat irritation.
- **Inhalation**: Ingestion may cause gastrointestinal irritation and diarrhoea.

4. First-aid measures

- **Eye contact**: In case of contact, immediately flush eyes with a copious amount of water for at least 15 minutes. Get medical attention if irritation occurs.
- **Skin contact**: Wash skin thoroughly with soap and water or use recognised skin cleanser. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if irritation develops.
- **Inhalation**: If inhaled, remove to fresh air. Get medical attention if symptoms appear.
- **Ingestion**: Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately.

5. Fire-fighting measures

- **Extinguishing media**:
  - Suitable: In case of fire, use water fog, foam, dry chemical or carbon dioxide extinguisher or spray.
  - Not suitable: Do not use water jet.
  - Hazardous decomposition products: These products are carbon oxides.
  - Unusual fire/explosion hazards: This material is not explosive as defined by established regulatory criteria.
  - Special fire-fighting procedures: None identified.
  - Protection of fire-fighters: Fire-fighters should wear self-contained positive pressure breathing apparatus (SCBA) and full turnout gear.
6. Accidental release measures

<table>
<thead>
<tr>
<th>Personal precautions</th>
<th>Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (See Section: &quot;Exposure controls/personal protection&quot;). Follow all fire fighting procedures (See Section: &quot;Fire-fighting measures&quot;).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental precautions and clean-up methods</td>
<td>If emergency personnel are unavailable, contain spilled material. For small spills add absorbent (soil may be used in the absence of other suitable materials) scoop up material and place in a sealed, liquid-proof container for disposal. For large spills dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal. Avoid contact of spill material with soil and prevent runoff entering surface waterways. See Section 13 for Waste Disposal Information.</td>
</tr>
<tr>
<td>Personal protection in case of a large spill</td>
<td>Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.</td>
</tr>
</tbody>
</table>

7. Handling and storage

| Handling | Wash thoroughly after handling. |
| Storage | Keep container tightly closed. Keep container in a cool, well-ventilated area. |
| VCI Storage class (Lagerklasse) | 10 |

8. Exposure controls/personal protection

| Occupational exposure limits | This product does not have any assigned OELs. |
| Control Measures | Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits. |
| Hygiene measures | Wash hands after handling compounds and before eating, smoking, using lavatory, and at the end of day. |
| Personal protective equipment Respiratory system | None required; however, use of adequate ventilation is good industrial practice. |
| Skin and body | Wear appropriate clothing to avoid prolonged skin contact. |
| Hands | Wear protective gloves if prolonged or repeated contact is likely. Chemical resistant gloves. Recommended: nitrile gloves. The correct choice of protective gloves depends upon the chemicals being handled, the conditions of work and use, and the condition of the gloves (even the best chemically resistant glove will break down after repeated chemical exposures). Most gloves provide only a short time of protection before they must be discarded and replaced. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Gloves should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions. |
| Eyes | Safety glasses with side shields. |

9. Physical and chemical properties

| Flash point | 236 °C (Open cup) Cleveland. |
| Pour point | -42 °C |
| Viscosity Index | 145 |
| Colour | Colourless. |
| Odour | Mild. |
| Physical state | Liquid. |
| Density | <1000 kg/m³ (<1 g/cm³) at 20°C |
| Vapour pressure | <0.01 kPa (<0.075 mm Hg) at 20°C |
| Solubility | Insoluble in water. |
| Viscosity | Kinematic: 144 mm²/s (144 cSt) at 40°C Kinematic: 18.6 mm²/s (18.6 cSt) at 100°C |
10. Stability and reactivity

Incompatibility with various substances
Reactive or incompatible with the following materials: oxidizing materials.

Hazardous polymerisation
Will not occur.

Hazardous decomposition products
These products are carbon oxides.

11. Toxicological information

Chronic toxicity
Carcinogenic effects
No component of this product at levels greater than 0.1% is identified as a carcinogen by ACGIH, the International Agency for Research on Cancer (IARC) or the European Commission (EC).

12. Ecological information

Persistence/ degradability
Inherently biodegradable.

Mobility
Nonvolatile. Liquid. Insoluble in water.

Environmental hazards
Not classified as dangerous.

13. Disposal considerations

Disposal Consideration / Waste information
Avoid contact of spilled material and runoff with soil and surface waterways. Consult an environmental professional to determine if local, regional or national regulations would classify spilled or contaminated materials as hazardous waste. Use only approved transporters, recyclers, treatment, storage or disposal facilities. Dispose of in accordance with all applicable local and national regulations.

Unused product
European waste catalogue (EWC) 13 02 06* synthetic engine, gear and lubricating oils

Used/ contaminated product
European waste catalogue (EWC) 13 02 06* synthetic engine, gear and lubricating oils

Packaging
European waste catalogue (EWC) 501 10* packaging containing residues of or contaminated by dangerous substances

However, deviation from the intended use and/or the presence of any potential contaminants may require an alternative waste disposal code to be assigned by the end user.

14. Transport information

Not classified as hazardous for transport (ADR/RID, ADNR, IMDG, ICAO/IATA)

15. Regulatory information

Label requirements

Risk phrases
This product is not classified according to the EU regulations.

EU regulations
Classification and labelling have been performed according to EU directives 1999/45/EC and 67/548/EEC as amended and adapted.

Other regulations

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Product name: Viscoleb 150
Product code: 650795-FR10
Version: 1.04
Date of issue: 3 January 2007
Format: Germany
Language: ENGLISH
Build: 8.2.1 (Germany)
16. Other information

History
Date of issue 03/01/2007.
Date of previous issue 22/11/2005.
Prepared by Product Stewardship

Notice to reader
Revision Indicator: The presence of a triangle in the upper left corner of a field indicates a change since the previous version.

All reasonably practicable steps have been taken to ensure this data sheet and the health, safety and environmental information contained in it is accurate as of the date specified below. No warranty or representation, express or implied is made as to the accuracy or completeness of the data and information in this data sheet.

The data and advice given apply when the product is sold for the stated application or applications. You should not use the product other than for the stated application or applications without seeking advice from us.

It is the user’s obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. The BP Group shall not be responsible for any damage or injury resulting from use, other than the stated product use of the material, from any failure to adhere to recommendations, or from any hazards inherent in the nature of the material. Purchasers of the product for supply to a third party for use at work, have a duty to take all necessary steps to ensure that any person handling or using the product is provided with the information in this sheet. Employers have a duty to tell employees and others who may be affected of any hazards described in this sheet and of any precautions that should be taken.
Specification for blank cuts

The dimensions and the material of the blank cuts are specified in the machine contract!

Material: corrugated paper from B-flute (fine flute)
          or E-flute (micro flute)
Outer layer: approx. 140 g/m² (Testliner)
Flute (B): approx. 110 g/m² (semichemical paper pulp)
Inner layer: approx. 140 g/m² (Testliner)
Tolerance for the flat dimensions: ± 2 mm
Tolerance for the flute dimensions: ± 1 mm
Execution: punched
Vault: max. 12 mm/m

The outer layer must be so dense that the blank cuts can be taken out of the magazine by means of suction caps.

Storage

The blanks must be stored in a dry and dust-free room in horizontal position.

The camber of the blank cuttings may not be higher than 12 mm/m. Furthermore the prescriptions of the manufacturer are to be observed in the following points:

- relative humidity
- storage
- transportation
The fast adhesive for cardboard packaging
Innocoll HMP 2112 has been developed especially for gluing paper and cardboard. The main areas of application of this adhesive are sealing folded cartons, setting up trays, and producing small packs. The adhesive has a very short open time and sets quickly, and outstandingly suitable for use on fast machines.

PROCESSING
- This adhesive is suitable for all common hot melt application systems.
- The operating temperature is between 160 and 180° C depending on the application.
- Use adequate ventilation to remove any fumes or vapors that are generated.

STORAGE
- Keep containers tightly covered to avoid contamination.
- Use the adhesive according to the date of receipt and within one year after delivery.
- Do not mix with other adhesives.

ECOLOGY
The composition of the product meets the requirements of the American FDA Indirect Food Additive Regulation 21 CRF 175.105 , ‘Adhesives’ currently in effect.

We urgently recommend that you familiarize yourself with the information contained in our Material Safety Data Sheet. Our Applications Engineering Dept. is available to provide you further information on processing and application options. Our experts will assist customers in obtaining the best results with our products. The recommendations given are based on research and experience we believe to be accurate. Because, however, we are not in a position to control the conditions under which our products are shipped, stored, and processed, it is not possible for us to guarantee specific results. We will also not be held liable for any direct or indirect damage resulting from the use of our products. Our representatives have no authority to waive or change the foregoing provisions.

PHYSICAL PROPERTIES

<table>
<thead>
<tr>
<th>Type</th>
<th>Appearance</th>
<th>Viscosity (Brookfield RV 160° C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot melt</td>
<td>Ivory-colored, prills</td>
<td>Approx. 1,100 mPa.s</td>
</tr>
<tr>
<td>Viscosity (Brookfield RV 170° C)</td>
<td>Viscosity (Brookfield RV 180° C)</td>
<td>Softening point (Mettler):</td>
</tr>
<tr>
<td>Approx. 800 mPa.s</td>
<td>Approx. 600 mPa.s</td>
<td>Approx. 115° C</td>
</tr>
</tbody>
</table>
2. COMPOSITION, INFORMATION ON INGREDIENTS

CHEMICAL FAMILY: Hot melt adhesives

COMPONENT: None of the components poses a risk.

3. HAZARDS IDENTIFICATION

OVERVIEW OF EMERGENCY MEASURES: Not classified as hazardous.

EYES: As supplied: irritant as a foreign body. As used: severe thermal hazard.

SKIN CONTACT: As supplied: no hazard. As used: severe thermal hazard.

INHALATION: At excessively high temperatures, the product can produce vapors and aerosols may be irritating to the eyes and respiratory tract.

INGESTION: Low oral toxicity.

4. FIRST AID MEASURES

EYES: If hot, flush with cool water. Treat as a wax or resin burn. Do not attempt to remove solidified adhesive. Get medical attention immediately. As supplied: remove as a foreign object.

SKIN CONTACT: If hot, flush with cold water and treat as a wax or resin burn. Do not attempt to remove solidified adhesive. Get medical attention immediately. As supplied: not hazardous.

INHALATION: Move the person to fresh air immediately. If irritation persists, seek medical attention.

INGESTION: None required.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide (CO₂); dry chemical

SPECIAL FIRE FIGHTING PROCEDURES: No special procedures required.

FIRE AND EXPLOSION HAZARDS: The product is combustible at high temperatures.

HAZARDOUS COMBUSTION PRODUCTS: Carbon monoxides, carbon dioxides, and unknown hydrocarbons form when the product degrades.

FLASH POINT: > 200° C

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK PROCEDURES: Allow the product to cool and solidify. Scrape up and place in a suitable container for disposal. Refer to the General Safety Data Sheet for information of safety and environmental precautions.

7. HANDLING AND STORAGE

HANDLING / STORAGE: Store the product in a cool dry place. Warning! This product should not be heated beyond the recommended temperature. Hazards evolving from pyrolytic products are unknown and could therefore represent a health hazard.

SENSITIVITY TO STATIC ELECTRICITY: No special sensitivity.

8. EXPOSURE CONTROL AND PERSONAL PROTECTION

VENTILATION REQUIREMENTS: Normal room ventilation should be sufficient when working with small amounts of the product. Local ventilation should be provided when working with larger amounts of the product or if needed for worker comfort.

EYE PROTECTION REQUIREMENTS: Wear safety glasses, goggles, or a facemask to protect against splashing. Personal eye protection should be EN 166-compliant.

GLOVE REQUIREMENTS: Wear thermally resistant gloves.

CLOTHING REQUIREMENTS: Wear overalls or a lab coat.

RESPIRATORY PROTECTION REQUIREMENTS: Respiratory protection equipment is not required, if adequate ventilation is provided.

9. PHYSICAL AND CHEMICAL PROPERTIES

PURE SUBSTANCE OR PREPARATION: Preparation

PHYSICAL FORM: Solid

COLOR: Yellow

ODOR: Pine

BOILING POINT: > 200° C

MELTING/FREEZING TEMPERATURE: approx. 115° C

SOLUBILITY IN WATER: Insoluble, water RELATIVE DENSITY: 1 000 (water = 1)

FLASH POINT: > 200° C

10. STABILITY AND REACTIVITY

STABILITY: Stable

REACTIVITY: n/a

11. TOXICOLOGICAL INFORMATION

EYES: As supplied: irritant as a foreign body. As used: severe thermal hazard.

SKIN: As supplied: no hazard. As used: severe thermal hazard.

INHALATION: At excessively high temperatures, the product can produce vapors and aerosols may be irritating to the eyes and respiratory tract.

INGESTION: Low oral toxicity.

EFFECTS OF CHRONIC EXPOSURE: Although this product has not been tested for chronic effects, it is judged as having a low order of toxicity based on component information. Use of good industrial hygiene practices is recommended.

TARGET ORGANS: No known effects.

PRODUCT INFORMATION: Not determined.

12. ECOLOGICAL INFORMATION

POTENTIAL EFFECTS ON THE ENVIRONMENT: Unknown

ECOTOXICITY: Unknown

MOBILITY: Unknown

PERSISTENCE AND DEGRADABILITY: Unknown

BIOACUMULATION POTENTIAL: No

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHODS: Waste disposal should be in accordance with European Community, national, and local regulations.

WASTE KEY NUMBER: 080410

EMPTY CONTAINER WARNINGS: Not required.

14. TRANSPORT SPECIFICATIONS (also see Part 9)

IATA CLASSIFICATION: Not classified as hazardous.

IMDG / GG VSEE CLASSIFICATION: Not classified as hazardous.

ADR / RID: Not classified as hazardous.

15. REGULATORY INFORMATION

WATER POLLUTION CLASS: 1, mildly water-polluting

EINECS: All components of this product are listed in EINECS or ELINCS.

16. OTHER INFORMATION

DATE OF ORIGINAL DOCUMENT: 5/7/07

FOR REGULATORY INFORMATION, CONTACT:

KHS AG Dortmund
Joachim Brzoska
Cell: +49 (160) 906-87061
E-mail: joachim.brzoska@khs.com

This safety data sheet has been compiled based on directives 1999/45/EC and 91/155/EEC. The information is provided for health and safety assessment by an industrial user. Compliance with national or local health, safety, and environmental regulations is mandatory. This information does not constitute indication of suitability for specific uses.
# Specification for Shrinkfilm packages

1 **Required attributes for shrinkfilm**

| Orientation | The film should be bi-axial oriented, i.e. the shrinkfilm has to feature attributes in running direction as well as in cross direction. |
| Shrinkage values | Measurement in oil bath at 130 °C / 60 sec by KHS-Kisters-methods  
  • in machine running direction (lengthwise shrinking): 60 – 70 %  
  • cross to machine running direction (crossways shrinking): 10 – 15 % |
| Film thickness | 40 – 80 my +/- 5 % are possible to handle on KHS Kisters packaging machines (thinner film possible, check and test with samples required). A KHS Kisters recommendation will be prepared order-related for each pack formation! |
| Shrinking | Shrinkfilm should feature sufficient shrinking at 12 sec. effect time (run-through time at shrinktunnel) and max. 220°C working temperature. |
| Sealing | Shrinkfilm should feature sufficient sealing at 12 sec. effect time (run-through time at shrinktunnel) and max. 220°C working temperature. |
| Printing |  
  • The printing material should be suitable for shrinking colour-tear-free shrinking, i.e. the printing should be suitable for the energy-required for shrinking process- (Temperature, Quantity of air and affect time) without damage at the printing!  
  • No negative interaction of shrinking- / cooling-process by printing, for example “orange skin” and respectively a very long cooling phase to hardening finally of the pack => maximum =5 seconds!  
  • No printing or symbols in the area of the face side border and on the pack side border (no guaranty for crumple-free and colour-tear-free shrinking at this sections)! |
| Weight of film reel | Max. 130 kg (defined for the following dimension data). |
| Core diameter |  
  • Standard-execution: 70...76 mm  
  • Special-execution: 77...82 mm |
| Outer reel diameter | Max. 450 to 550 mm, depending on machine type. We accept 10% of the film reel with a minimum diameter below 30% of the index value. |
| Reel width | Max. 670 to 930 mm, depending on machine type. Film width will be specified order-related for each pack formation. |
| Outside | No damages of the reel. |
| Lateral off-set | ≤ 2 mm |
| Cone | ≤ 1,25 % |
| Electrostatic charge | ≤ 10 kV |
| Order-related film parameter | The following parameter will be settled / recommended by KHS Kisters order-related stating packaging shape and finish:  
  • Film thickness (recommendation)  
  • Film shrinking values crossways/lengthwise (recommendation)  
  • Film width (recommendation at 1-track, determination at 2 or 3-track operation)  
  • Film length (determination)  
  • Film splicing (determination)  
  • Wedge width (determination) |

Stand 02/2006
## Specification for Shrinkfilm packages

### 2 Required attributes for products and machine environment

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Status</strong></td>
<td>Products should be clean and dry. Labels should be adhere close at the product.</td>
</tr>
<tr>
<td><strong>Product temperature</strong></td>
<td>The product temperature should not be &lt; 10°C.</td>
</tr>
<tr>
<td><strong>Standing reliability</strong></td>
<td>The product should have a sufficient standing reliability, so that the products does not fall or “walk out of formation” at transfers in the machine by KHS Kisters standard machine execution!</td>
</tr>
<tr>
<td><strong>Non deformability and stability</strong></td>
<td>For a packaging in film only the packs should be stable and non deformable.</td>
</tr>
<tr>
<td><strong>Airflow</strong></td>
<td>No draught =&gt; Sinking of temperature in shrinktunnel.</td>
</tr>
<tr>
<td><strong>Room temperature</strong></td>
<td>Room temperature $\geq 5 ^\circ C$ and $\leq 35 ^\circ C$.</td>
</tr>
</tbody>
</table>

### 3 Restrictive Attributes

Shrinking quality and function of machine can only be warranted with special arrangement and function test.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product temperature</strong> $&lt; 10 ^\circ C$</td>
<td>Limitations at shrinking quality and compliance with shrinktunnel working temperature.</td>
</tr>
<tr>
<td><strong>Wet products</strong></td>
<td>Limitations at shrinking quality and compliance with shrinktunnel working temperature. (Where applicable a product drying should be integrated in the line before packaging machine).</td>
</tr>
<tr>
<td><strong>Cans, bottles or the like, loose, without carton</strong></td>
<td>Examples of packformations: 4x3; 5x4; 8x4; 6x4;7x5 or comprerable. Limitations at stability and fixity of the pack. Warranty only to interface “end of KHS Kisters scope of supply”. No Warranty for transport to palletizer and for palletising with instable packs and / or nesting products! KHS Kisters recommends to pack such pack formations generally with carton (tray or pad).</td>
</tr>
<tr>
<td><strong>Packformations lengthwise generally</strong></td>
<td>Examples of packformations: 4x6; 3x5; 3x4; 2x4 or comprerable. Limitations at stability and fixity of the pack and at optic of bull eyes.</td>
</tr>
<tr>
<td><strong>Shrinkfilm</strong></td>
<td>Shrinkfilm, which do not correspond in general and format specific specification.</td>
</tr>
<tr>
<td><strong>Film in Film</strong></td>
<td>Film in Film-packaging, for example film-multipacks witch will be packed to a collator-pack in film only. Limitations possible by means of gluing of the inner and outer film.</td>
</tr>
<tr>
<td><strong>Crumple-free shrinkfilm packs</strong></td>
<td>KHS Kisters assured generally not absolutely crumple-free shrinkfilm packages.</td>
</tr>
</tbody>
</table>