INEOS Polyolefins

CODE OF PRACTICE FOR THE SAFE OPERATION OF BAGGING LINES

Issue - v2

INTRODUCTION

It is Ineos Polyolefins policy that safety of operation must be paramount. The implementation of this policy in the distribution field poses special problems because of the extent to which we are dependent on third parties and the difficulty of supervising distribution operations in the field. We must nevertheless be quite satisfied that our distribution operations are carried out competently and safely, and in accordance with national legislation in force. This Company '*Code of Practice for the safe operation of Bagging lines '* has been prepared to help fulfil this aim. The Code should therefore be followed by those External companies and Departments of Ineos concerned with distribution activities in Europe.

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SECTION 1: SCOPE

A bagging line generally comprises a bagging and weighing machine, bag printer, check weigher, metal detector, palletiser, film hooder with heat schrinker or stretch hooder and belt conveyors.

The design and construction requirements of bagging line machines are subject to European legislation, the core document being the 'Machine Directive 89/37' , refers to several EN norms which each cover specific area's (e.g. EN 954-1: safety related parts of control systems, EN 418: emergency stops etc.. see also Appendix 1: List of EN norms). However the machine directive does not impose compliance to these norms (these are only 'recommended'). Also manufacturers are allowed to self certify the CE requirements. Therefore CE conformity to the Machine directive does not give any guarantee that a machine is safe to operate.

Most accidents with bagging line machines happen when operators or maintenance personnel enter the machine and become trapped between fixed and moving parts such as transfer heads, sweepers, pushers etc…
Entry into the machine is necessary for a number of reasons: adjustment blockages, cleaning, maintenance etc.. All these require personnel to go into areas where they could be at risk of injury unless proper precautions are taken.

Some serious accidents during bagging line operations at Ineos facilities have shown that there is a need for a company safety standard.

This document describes the Ineos Polyolefins requirements for the safe operation of bagging lines.
It comprises the following main chapters:

- Hazard potential (risk assessment)
- Guarding systems
- Isolation for entry into the guarded area's
- Maintenance and inspection of guards and safety devices
- Training
- Other safety requirements

SECTION 2 HAZARD POTENTIAL

2.1 General

Perimeter fencing must prevent access to area's in which it would be possible for parts of the body to come into contact with any moving parts capable of causing injury.
Although the machines operate automatically, it is necessary for the operator to enter the fenced area from time to time to carry out routine operations. Therefore a risk assessment must be carried out by the manufacturer and/or by the user.

In first instance one must keep the number of entry's to an absolute minimum.

2.2 Risk assessment

It is recommended that the EN 1050 norm is used as a basis for a risk assessment of the bagging line.
This standard does not specify the precise method but provides detailed guidance as to what should be considered

The main elements of the risk assessment are:

Define machine boundaries: Description, intended use, space and time limits.

Identify hazards: These include: mechanical, electrical, pneumatical, hydraulical etc.. hazards, hazardous situations considering the various aspects of the operator-system relationship, the possible states of the machine and foreseeable misuse.

Analyse consequences: This primarily relates to the severity of injury as a result of exposure to the hazard. It can also be described in terms of economic losses due to interruption to production and asset damage or in terms of environmental damage.

Estimate/measure risks: Risk is defined as the chance (probability) of the harm being realised combined with the consequences (severity). (see risk analysis score chart below)

Evaluation of risks: A criterion is selected to evaluate risks. That is to decide if risk is tolerable or should warrant some corrective or preventive measures.

Risk control strategy: If risk is judged to be intolerable, a hierarchy of risk reduction option is set out in the Machinery Directive.

1: Design out hazards. E.g. fixed guards enclosing all dangerous parts

2:Reduce risk by design. The design should minimise the need for access into the danger zones and to accommodate foreseeable misuse. E.g. interlocked gates

3:Incorporate safeguards and safety devices. E.g. pull wires to isolate machinery

4:Warn the user of any residual risks and to develop safe systems of work. E.g. information, training…

Verification: There will be a need to review the system following modifications to ensure that these measures will reduce risks to a tolerable level and that no new hazards are generated as a result of design changes.

Example:

1: Is access possible to any part of machinery that could cause injury ?

Machine part	Location	Part of body at risk	Estimated injury	Risk score

Risk analysis scoring chart

		Incident Frequency				
	SCORE OUT OF 25	Very unlikely	Unlikely	Occasionally	Likely	Very Likely
Consequence of Incident	Minor	1	2	3	5	9
	Moderate	4	7	10	13	15
	Serious	6	8	14	16	18
	Severe	11	17	19	21	22
	Catastrophic	12	20	23	24	25

Note that scores > 12 normally justify further action to reduce the risk

Frequency	Criteria
VERY UNLIKELY	Almost never likely to occur
UNLIKELY	Remote possibility
OCCASIONALLY	Has been known to occur
LIKELY	Recent past records something similar
VERY LIKELY	Foreseeable that this will occur

Consequence	Criteria
MINOR	Actual or potential accident which may require simple first aid treatment but work would be resumed immediately.
MODERATE	Actual or potential accident requiring first aid treatment at a hospital and/or unable to resume work the same day.
SERIOUS	Actual or potential injury or health effects which may require three or more days off work.
SEVERE	Major accident as defined by COMAH/Seveso 2 and/or dangerous occurrence which is reportable to regulator and may result in prosection.
CATASTROPHIC	Anything greater than severe and probably results in total loss of a plant and/or fatalities

2: For the parts identified (score > 12), what safeguards/ devices are necessary to minimise the risk ?

Machine part	Fixed guard	Other guard/ device

3: Suitability of the installed protective systems:

Guard/ device	Suitable ?	Of good construction ?	Easily by-passed or disabled ?	Safe distance from danger ?	Adequate view (if needed)	Access only for maintenance ?

A risk assessment form is attached in appendix 3

SECTION 3 GUARDING SYSTEMS

3.1 General

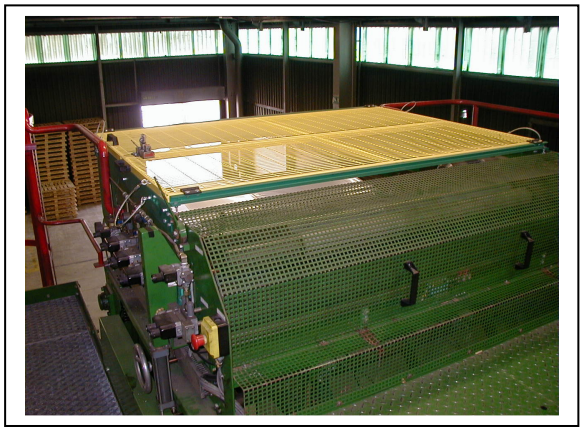
Access to hazardous areas must be prevented by fences. However at some points, there must be an access for operational reasons. This access must be controlled by gates that are interlocked with the machines' safety systems or by means of "light barriers" which initiate a shutdown of the machines when broken.
The line must be divided up into physically segregated zones into which entry may be gained under certain circumstances.
For each zone it must be described what protection is in place (guards, light barriers, other..) and its must be evaluated whether these provide adequate protection.

Example: palletiser (low level):

- *fenced with two entry gates*
- *Full electric and pneumatic isolation is impractical*
- *Hard-wired safety circuit will shut down all electrically-powered equipment and depressurize all*
  Pneumatically-operated systems if gates are open or ESD button pressed
- *Equipment can only be re-started from position outside the fence*
- *Also: key-interlock system. Obtaining key requires first shut down of palletiser AND inserting two locking pins into holes in the palletiser's frame (limits max possible movement of pallet lift to max 50 mm).*
- *Operator carries key which is required to re-start the palletiser*

3.2 Guards

All moving parts of the machines which operators can come into contact with must be fully guarded. Guards must be of robust construction and must be located at an adequate distance from the danger zone.



To minimise the possibility of operators climbing over the fences, a minimum height of 2 m is recommended.
In order to avoid that entry is done via a light barrier, there should be one entrance door per zone. By entering a zone via a light barrier, the machine will stop but a 2nd person could re-set and re-start it with the operator still in the machine.

Operators must receive clear warning instructions that entry into any part of the machine via a light barrier is forbidden !

3.3 Safety systems

Safety related features of the control system of new bagging lines should be assessed and categorised against the requirements of **EN 954-1** safety of machinery – safety related parts of control systems –part 1: general principles for design. This is with a view of demonstrating that the safeguards that are in place offer sufficient risk reduction to allow the line to be handed over for normal operation.

3.3.1 Double key lock system and limit switches at gates

All gates must be fitted with **double key lock systems**.
This system works as follows:

- The operator stops the machine
- The operators releases the first key from the control panel, which operates the electrical safety relay interlocking.
- This key is put in the Key Exchange box which allows to open the door of the area in which the machines are stopped.
- The door can only be opened when the operator removes the second key in the Key Exchange box
- This second key is kept with the operator. It will prevent that another operator locks the door and re-starts the machine

1st key stops the machine

Key Exchange Box

It is recommended to drill out the bolts of the double key lock system to prevent demounting of the locks or to use rivets.

As an alternative system, or in addition to the double key lock system, mechanically activated door **limit switches** which are interlocked with the machine can be used. However door switches are not the preferred method as these still allow to re-start the machine with someone in it and these systems can be by-passed relatively easily. For the use of these systems, a robust training program and detailed procedures must be in place.

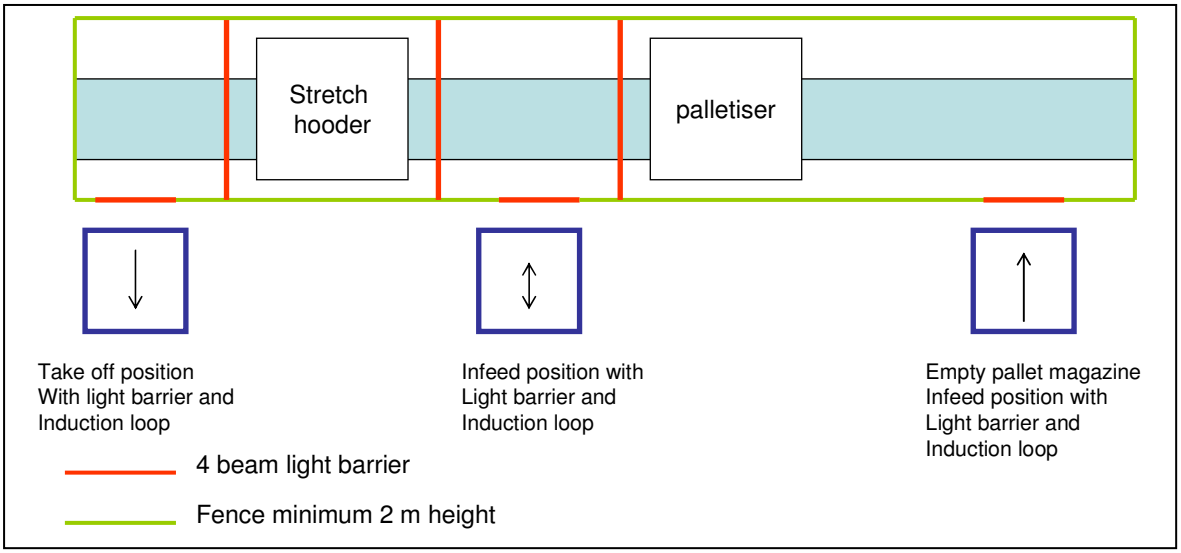
Gates of which the double lock keys systems or limit switches are found out of order, must be fitted with padlocks and warning signs indicating that access is forbidden until repaired.

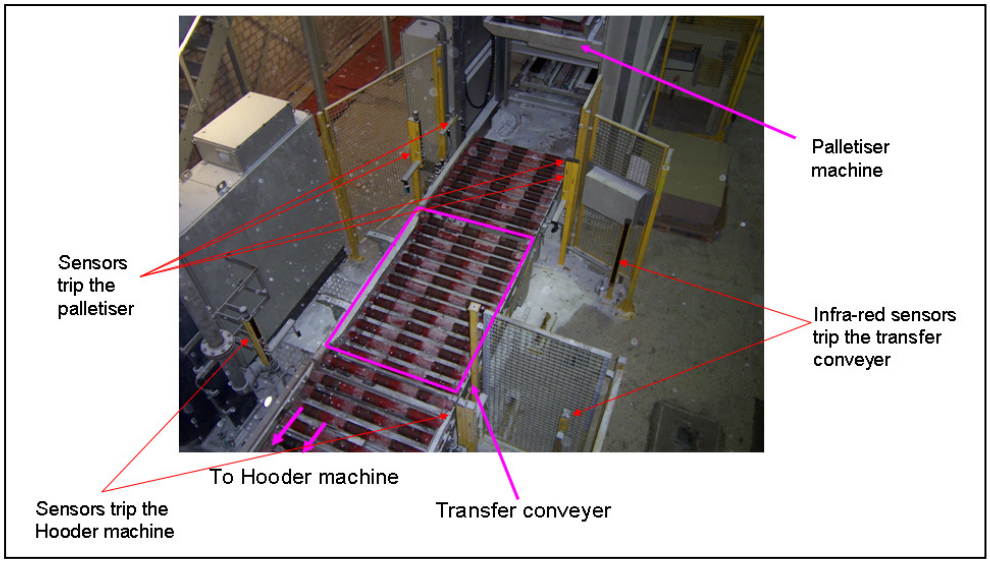
3.3.2 Light barriers/ curtains

At all sides where a pallet can enter or exit the bagging line, a light barrier/ curtain must be installed. Individual optic cells do not provide adequate protection.
It is preferred to install 4 beam light barriers (instead of 2 beam barriers) in order to keep the distance between the lower beam and roller conveyor as small as possible. This makes it possible to split up the emergency circuits of different parts of the machine whereby parts of the machine may remain in operation while the operator has entered another part of the machine. If, by coincidence the operator wants to enter a machine which is still in operation, it will be tripped by the light barrier.

Operators must however be instructed that light barriers are not an appropriate means to shut down a part of the bagging line.

Once the interlock of a light curtain has been activated, the machinery should only be able to be re-started by an intentional action at a control device located outside the danger zone.



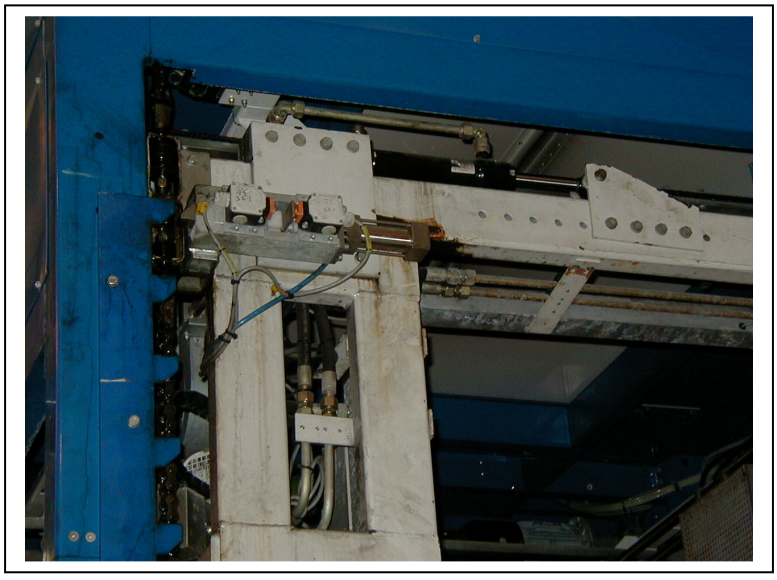


3.3.3 Dealing with stored (potential) energy

One of the main hazards of entry into hooders or palletizers is stored energy. Even if the electric power is cut off, the hooder hoist or palletiser ram can still fall down by gravity or, in case of a counterbalanced palletiser, be pushed up.
Hooders and palletizer therefore need to be fitted with restraint systems which are capable of holding a full load.

One option is to use pins which are fitted manually from outside the guard and which are interlocked with the electric power supply. This system requires the pallet hoist to be moved into the top or bottom position first.

A better system is an automatic pinning system with spring loaded shot bolts in the 4 corners of the hoist. These are fired when the light beams in front of the hooder or palletizer are broken or in case of electric/ air power failure. The system must be of a Fail Safe design. This system must ensure that the hoist can not fall a distance of more than 20 cm.



Both securing systems must be electrically interlocked (limit switches).

For counterbalanced palletizers there should be an additional trip which shuts down the machine when the chain between the palletiser ram and the counterweight goes slack.

3.3.4 Infeed position

To reduce the risk of a collision of 2 pallets when feeding in a pallet between the palletiser and stretch hooder, it is recommended to install a 'demand' system. The Forklift drivers has to pull a wire first. When he receives green light, he can put the pallet on the conveyor.
An automatic re-start may only be possible when the Forklift has left the infeed position.

Time-based power overrides may NOT be fitted

3.3.5 Induction loops

In the floor at the infeed and off take positions, induction loops should be installed. These allow the detection of a forklift and will mute the light curtain trip for the time that the forklift remains at this position. It allows automatic re-activation of the light curtain once the forklift has left.

To prevent by-passing of the induction loop by using metal objects, it is recommended to use a double induction loop system. The system compares the induction onto the right and left loop. When the value of the 2 loops is not identical, the light barrier will not be de-activated.

Induction loop and light curtain

3.3.6 Emergency stops/ pull wires

Emergency stops must comply with EN 418
Each machine must be fitted with at least one emergency stop switch.
An emergency stop must cut the electricity of the machine without creating another dangerous situation.
Resetting may not generate an automatic re-start of the machine.

On fixed conveyors pull wires at both sides must be installed.

On mobile conveyors, pull wires may be replaced by emergency switch buttons

Light curtains are a proper alternative.

3.3.7 Controls

Controls must be clearly visible and must be located outside the danger zone.

Also it may not be possible to operate controls from a danger zone.

From the main control position the operator must be able to ensure that there are no exposed people in the danger zone. If this is not possible, the control must be designed and constructed that an acoustic and/ or visual warning signal is given whenever the machine is about to start.

SECTION 4: ISOLATION FOR ENTRY INTO THE GUARDED AREA'S

4.1 Levels of Protection

Depending upon the task being carried out, the hazard to which personnel can be exposed may be different, within a single guarded zone. The level of protection required for the different tasks may therefore differ and hence the procedure for isolation prior to entry. Four levels of entry can be defined:

Isolation type 0: entry into guarded area's without isolation of power

Certain procedures shall require entry of personnel inside of the guarded areas while the equipment is live and operating. These must be limited to those for which there is no alternative procedure.

- The tasks falling within this scope must be clearly described
- A risk assessment must be carried out and specific named
- Only Responsible Personnel are allowed for entry under these conditions
- Approval (signature) of a high level manager is required

Isolation type 1: operator entry for frequent Routine Operations

Due to the frequency of entry for routine tasks, complete isolation is impractical since it would require the machines' control systems to be shut down and re-booted causing unacceptable loss of availability and impracticality of operation.

Provision must be made for operator entry inside the fences by installing protection devices which automatically stop the equipment and prevent unexpected start-up should either one of the gates be opened or a protective light beam broken. Once shut down by this method, the equipment can only be restarted from a position outside the fences and remote from the potential entry points. A system of interlocks between the entry gates and the protection devices must be provided. This can be achieved by using a double key lock system.

Isolation type 2: technician entry for mechanical Work

When maintenance work is to be carried the electrical power to the relevant guarding zone must be isolated. The local isolator would normally be used rather than the one in the switch house because its status can be seen by those working. In addition, instrument air must be depressurised and isolated (e.g. by means of a double block and bleed procedure).

A Permit To Work (PTW) is required for isolation and then a further one for carrying out the work.

Isolation type 3: Break-ins to high voltage equipment

Because hazardous voltage conductors are being broken into, fuse removal must be undertaken prior to starting the work, in addition to the procedure for mechanical work.

The table below is an example of isolation levels and related permissible tasks.

Isol'n Type	Discipline	Anticipated Frequency	Isolation Required	Control	Tasks Permissible	Remaining Hazards
0	*trained persons only*	*Once every 3 months for scheduled tasks*	*None*	*PTW, procedure*	*Specific tasks only approved by Area Engineer*	*Entrant fully exposed to all hazards. Special precautions to be defined in risk assessment*
1	*Process*	*Several times per shift*	*Trip safety circuit by means of Castell isolator and gate switch*	*Operating instructions, training & validation, procedure*	*Removal of bags, film, debris. Adjustment of bag positioning. Tasks not requiring tradesmen's tools. Washing down with water hoses. For a fuller list of permissible tasks see the Isolation Procedures.*	*24V control voltage still 'live' on most systems. Potential energy in some instrument air powered cylinders.*
2	*Maintenance*	*Once per week*	*Isolate and lock off 415V isolator in switch house. Double block and bleed of instrument air supply. Manual pinning if entering palletiser or hooder.*	*PTW, procedure*	*Normal mechanical maintenance. All work requiring PTW. Adjustments requiring tools etc.*	*Mechanical potential energy only*
3	*Electrical Break-in*	*Very infrequent – annually?*	*Isolate, lock off and fuse removal. Double block and bleed of instrument air supply. Manual pinning if entering palletiser or hooder*	*PTW, procedure*	*Electrical disconnections & terminations.*	*Mechanical potential energy only*

4.2 Isolation procedures

For each task and for each part of the bagging line, a detailed isolation procedure must be in place.

Example:

Document Section Reference		Task		
		Routine Operator Entry	Mechanical Work	Electrical Work
system	Sack Filling Machine	Procedure nr	Procedure nr	Procedure nr
	Low Level Belt/Roller Conveyors	Procedure nr	Procedure nr	Procedure nr
	Palletiser – high level	Procedure X	Procedure nr	Procedure nr
	Palletiser – low level	Procedure nr	Procedure nr	Procedure nr
	Insert/Removal Conveyor	Procedure nr	Procedure nr	Procedure nr
	Hooder & Roller Conveyors	Procedure nr	Procedure nr	Procedure nr

Procedure X:

1: isolation procedure
Drive pallet hoist to low or high position
Switch off main power switch
Remove Castell key (trips the safety circuit)
Exchange Castell key with key 5A
Insert safety pins; this releases keys 5B and 5C (hoist high or low level)
Keys 5A and 5B/5C release keys to gates
Open gate (would trip if 1st trip would have failed)
Remove pocket key and keep in your pocket

2: What can be done
Routine task: removal of bags, inspection, cleaning and adjustment of light beams….

3: What cannot be done
Climbing on conveyors, mechanical work, electrical work

For electric isolation purposes, it is recommended to have one main power isolator switch per group of equipment (zone). This allows a complete isolation without walking to the switch house.

SECTION 5 : MAINTENANCE AND INSPECTION OF GUARDS AND SAFETY DEVICES

5.1 For all activities which require entry into guarded area's, isolation procedures according to section 4 must apply.

5.2 For all mechanical and electrical work, a work permit needs to be issued.

5.3 A preventive maintenance scheme for all guards and safety devices which defines type of maintenance and frequency must be in place.

5.4 It must be defined who is responsible for eliminating faults

5.5 Regular ASA's must be done to assess the operator's response to machine faults and shut downs.

5.6 Operational audits must be organised by the management team

5.7 A system of regular (daily, weekly..) checks and inspections must be set up to ensure the good condition and functioning of guards and safety devices and that these have not been interfered with.

5.7.1: Regular check
At regular intervals, a detailed check of the fixed guarding must be done by a supervisor and each safety circuit must be tested.

Example:

Line guarding check:

	OK/NOK
Brief tour of the line to check for integrity of guarding	
Faults/ defects found:	

Safety circuits

Safety circuit	**How to test**	**What to check for**	**OK/NOK**
Bagging machine main circuit	Press emergency stop or remove Castell key. **Try restart**	Red light Machine can not be started	
Palletiser exit light curtain	Cross light curtain with pole **Try restart**	Red light Machine cannot be started	
……			
Faults detected:			

5.7.2: Annual check
A complete check of all safety systems must be done on an annual basis.

5.7.3 For all these checks, checklists must be completed.

5.7.4 All faults and defects must be recorded and reported to the supervisor immediately.

SECTION 6 : TRAINING

6.1 All operators must receive proper training on the safe operation of the bagging line and the proper use of the safeguard systems

6.2 The training program should at least contain the following:

-operation of the bagging line
-risks associated with entry within the guarded areas
-isolation and shut down procedures
-how the safety systems work
-Incident and accidents with bagging lines

6.3 Important is that the **theoretical part** is followed by a **practical part** whereby the bagging line is operated under supervision, followed by a **validation** whereby detailed questions about all possible scenario's are asked.

6.4 Records of training must be kept

6.5 Annual refresher trainings must be given

SECTION 7 : OTHER REQUIREMENTS

7.1 Instructions / procedures for normal handling and troubleshooting must be in place

7.2 A Management of change procedure must be in place for all modifications on the bagging line

7.3 All procedures need to be reviewed on an annual basis

7.4 All breakdowns, the frequency and reasons for entry's must be recorded and analysed to determine causes in order to take appropriate actions for improvement and thus reducing the need to enter into the guarded area's

7.5 There must be a safety policy which requires operators to report all unsafe situations and to make suggestions to improve safety.

7.6 Operators must also be encouraged to report all difficulties they are faced with to apply the procedures in order to avoid that they start by-passing the safety systems.

7.7 It is recommended to install CCTV systems to monitor the bagging line operations

7.8 Provide adequate protection (robust barriers) of the bagging line against collisions of forklifts

7.9 Provide adequate lighting

7.10 Install proper warning signs

7.11 Adequate PPE must be worn (minimum:hard hat, safety glasses, safety shoes, overall)

7.12 Proper fall protection systems (fences, barriers…) must be in place

7.13 feeding through a new polyethylene roll for a hooder must be done without the risk of falling from height (e.g. change film from ground level by gluing or welding the two sheet ends)

APPENDIX 1: MACHINE DIRECTIVE AND EN NORMS

The European Machine directive **89/37 EEC** outlines the main safety and health requirements related to the design and construction of machinery. Conformity to this directive is indicated with the CE mark and a declaration of conformity. Also other directives apply:

- **89/336 EEC**: Electromagnetic compatibility
- **72/23 EEC**: Low Voltage Directive

On top of the machine directive there are several EN norms which cover some specific area's The most important ones are:

- **EN 292-1 and -2: safety of Machinery – basic Concepts; general principles fort design**
- **EN 294: Safety distances**
- **EN 349: Minimum Gaps to avoid crushing of parts of the human body**
- EN 415 Safety of packaging machines
- **EN 415-4: Safety of palletizers and de-palletizers**
- **EN 418: Emergency stops**
- EN 775: Industrial Robots
- EN 811: Safety distances to prevent danger zones being reached by the lower limbs
- EN 842: Visual danger signals
- **EN 953: Guards, general requirements for the construction of fixed and movable guards**
- **EN 954-1: Safety related parts of control systems**
- EN 981: System of auditory and visual danger and information
- EN 982: safety requirements for hydraulic power systems
- EN 983: safety requirements for pneumatic power systems
- EN 999: safety of machinery - positioning of protective equipment
- **EN 1037: Prevention of unexpected start up**
- EN 1050: Principles for Risk assessment
- **EN 1088: Interlocking devices**
- prEN 1921: Industrial automation systems: safety of integrated manufacturing systems
- **EN 60204-1: Electrical equipment of machines**
- EN 61496: Electrosensive protective equipment
- EN 61508: Functional safety of electrical/ electronic safety-related systems

Bagging lines must as a minimum comply with those norms which are highlighted in bold .

Conformity with the machinery Directive is indicated with the CE Mark. To legally affix the CE mark to a machine, manufacturers must first issue a Declaration of Conformity. These are issued for each individual machine of the bagging line. A declaration of CE conformity must also be obtained for the complete bagging line.
The Machine Directive does not impose compliance to the above norms (these are only 'recommended').Therefore CE conformity to the Machine directive alone does not give any guarantee that a machine is safe to operate.

APPENDIX 2: AUDIT CHECKLIST

section	Checklist	R/M	Y/N	Comments
1	All parts of the bagging line fully compliant with the machine directive 98/37 and related EN norms ?	M		
1	State the EN norms to which the machine complies:	R		
2.1	Has a Risk assessment been done which has identified all the hazards associated with all parts of the bagging line and the safeguards required to minimise the risks of body parts to come into contact with dangerous moving parts ?	M		
2.2	Has this Risk assessment been done according to EN 1050 ?	R		
2.2	Has the severity of the hazards associated with each individual machine been identified ?	M		
2.2	Has the type of guarding systems for each individual machine or zone been identified ?	M		
2.2	Has the suitability of the safeguards been evaluated (type, good construction, easily by-passed or disabled, safe distance from danger, adequate view etc..)	M		
A3	Have the Risks of Working at Height been taken into account ?	M		
3.1	Is the line divided up into physically segregated zones into which entry may be gained under certain circumstances?	M		
3.1	Is it for each individual zone described what protection is in place ?	M		
3.3	Have all safety related features of the control system been assessed and categorised against the requirements of EN 954-1 safety of machinery ?	R		
4.1	Has the type of entry inside guard fences, the frequency and the isolation methods been identified ?	M		
4.2	Are there, per machine/zone, detailed isolation procedures for each type of work to be done ?	M		
5.3	Is there a preventive maintenance scheme for all safeguards which defines type of maintenance and frequency ?	M		
5.2	Is there a Permit to Work System for all maintenance activities ?	M		
5.4	Are responsibilities for eliminating faults defined ?	M		
5.5	Are regular ASA's done ?	M		
5.6	Do the management carry out regular audits ?	M		
5.7	Is there a system in place for regular (daily, weekly..) inspections and tests ? (define details of inspection and frequency)	M		
5.7	Do the daily checks include checking the safety relays ?	M		
5.7.4	Are checklists used ?	M		
5.7.5	Are all faults and defects recorded and reported to the supervisor immediately ?	M		
6.1	Have all operators been trained in the use of the safeguard mechanisms.	M		
6.2	Does the training program contain at least:			
	• Operation of the bagging line			
	• Risk associated with entry into guarded area's	M		
	• Isolation and shut down procedures	M		
	• Working of safety systems	M		

	• Incidents and accidents happened on bagging lines	M		
6.3	Is this training followed by a practical part whereby the operator works under supervision ?	M		
6.3	Is the practical part followed by a validation whereby the operator is tested on his knowledge of all possible scenario's ?	M		
6.4	Are records of training kept ?	M		
6.5	Are annual refresher trainings given ?	M		
6.2	Is there evidence showing that the operators have a good understanding of how the safeguard mechanisms work ?	M		
3.2	Have operators received clear warning instructions that entry into any part of the machine via a light barrier is forbidden ?	M		
7.1	Are instructions / procedures for normal handling and troubleshooting in place ?	M		
7.2	is a Management of change procedure in place for all modifications on the bagging line ?	M		
7.3	Are all procedures reviewed on an annual basis ?	M		
7.4	Are all breakdowns, the frequency and reasons for entry's recorded and analysed to determine causes in order to take appropriate actions for improvement and thus reducing the need to enter into the guarded area's ?	M		
7.5	Is there a safety policy which requires operators to report all unsafe situations and to make suggestions to improve safety ?	M		
7.6	Are operators encouraged to report all difficulties they are faced with to apply the procedures in order to avoid that they start by-passing the safety systems ?	M		
	Site visit			
3.1	Is access to hazardous area's prevented by fences ?	M		
3.2	Is there one entrance per zone ?	R		
	Is there no evidence that safeguard mechanisms have been interfered with ?	M		
3.2	Are the guards firmly secured and not easily removable / By passed ?	M		
3.2	Do the guards ensure that no objects will fall into the moving parts ?	M		
3.2	Do the guards permit safe, comfortable and relatively easy operation of the machine ?	M		
3.2	Are guards minimum 2m high ?	R		
3.2	Do these fully enclose all moving parts of the machines ?	M		
3.2	Are guards located at an adequate distance from the danger zone ?	M		
7.8	Is there adequate protection from Forklift collision ?	M		
3.3.7	Is there a system to shut down the machinery before safeguards are removed ?	M		
3.3.6	Can emergency stops not be by-passed ?	M		
3.3.7	Are controls clearly visible, identifiable and clearly marked ?	M		
3.3.7	Are controls located outside the danger zones ?	M		
3.3.7	Can the operator see any other person who may be exposed to risk when the controls are operated ?	M		
7.10	Are there suitable, audible, visible or other warnings ?	M		
3.3.1	Are double key lock systems in use ?	R		
3.3.1	Are measure taken to prevent demounting of the key locks (e.g. rivets)	R		
3.3.1	As alternative, are there door limit switches installed which are interlocked with the machine ?	M		
3.3.1	Is there a system in place which requires to lock the gates of which the double key lock system or the limit switches are found defective ?	M		
3.3.2	Are light barriers installed at all sides where a pallet can enter or exit the bagging line ?	M		

3.3.2	Do these light barriers have 4 beams ?	R		
3.3.2	Can, after activation of a light curtain interlock, the machinery behind it only be re-started by an intentional action at a control device located outside the danger zone. ?	M		
3.3.3	Are hooder and palletizer fitted with restraint systems (e.g. Pins, shot bolts..), capable of holding a full load and which are activated when the light beams are broken or in case of power failure ?			
3.3.3	Are these systems interlocked ?	M		
3.3.3	Is the system of 'Fail Safe' design ?	M		
3.3.3	Does the system ensure that the hoist can not fall a distance of more than 20 cm ?	M		
3.3.3	In case of counterbalance palletizers, is there an additional trip which shuts down the machine when the chain between palletizer hoist and counterweight goes slack ?	R		
3.3.4	Are infeed positions fitted with a 'demand' system ?	R		
3.3.4	Time based power overrides are NOT fitted ?	M		
3.3.5	Are all entrance and exit positions fitted with induction loops ?	M		
3.3.5	Are these induction loops of double design ?	R		
3.3.6	Are all mobile belt conveyors fitted with pull wires or emergency stops (EN 418)?	M		
3.3.6	Are al machines fitted with emergency stops (EN 418) ?	M		
3.3.6	Does the re-setting of the emergency stop not create an automatic re-start ?	M		
7.9	Is there adequate lighting ?	M		
7.11	Is adequate PPE being worn ?	M		
7.7	Are CCTV systems in place ?	R		
7.12	Are Proper fall protection systems (fences, barriers) in place ?			
7.13	Can feeding through a new polyethylene roll for a hooder be done without the risk of falling from height (e.g. change film from ground level by gluing or welding the two sheet ends)	M		

Remarks:

APPENDIX 3: RISK ASSESSMENT FORM

1: Identify all the risks for injury of all dangerous parts

Machine part	Location	Part of body at risk	Estimated injury	Risk score

And what safeguards are necessary to minimise the risks ?

2:Identify the suitability of the installed protective systems

Guard/ device	Suitable ?	Of Good construction ?	Easily by-passed or disabled ?	Safe distance from danger ?	Adequate view (if needed)	Access only for maintenance ?

3: What maintenance is needed for guards and protective devices ?

Guard/ device	Maintenance required ?	Frequency ?

4: What inspection of the work equipment is needed

Inspection required	Details of inspection	frequency

5: What information and instruction/ training must be provided to the following staff ?

Operators	Maintenance staff	Managers/ supervisors	visitors
Operating/ trouble shooting/ isolation procedures/ emergency response..	Key hazards/ Inspection and testing procedures/ isolation procedures/ emergency response..	Safety risks and control procedures/ emergency response..	Key hazards/ emergency response..

6: What are the other hazards ?

	Likely ?	action
Any article or substance falling or being ejected from the machine		
Rupture of hydraulic hose		
Overheating or fire		
Slipping due to winter conditions		
Corrosion		
Unintentional premature discharge of dust, gas, liquid or other..		
Any part of the machine at a high or low temperature likely to cause injury		
Working at height		

7: Emergency stop controls

Are there suitable emergency stop controls located at appropriate points ?

8: Isolation methods
Electricity/ compressed air/ steam…..

9: Controls

- Are controls clearly visible, identifiable and clearly marked ?
- Are controls located to ensure that operators are not exposed to risk ?
- Can the operator see any other person who may be exposed to risk when the controls are operated ?
- Are there systems of work to ensure that no one is likely to be at risk when the machine starts ?
- Are there suitable, audible, visible or other warnings ?

10:Workplace environment
Sufficient light, workplace temperature

11: PPE

12 Safety signs and warnings
Adequate signs ?