

Anhui Well Advanced Technology Co.,Ltd

CE MD REPORT

Prepared For :	Anhui Well Advanced Technology Co.,Ltd No. 23 Weisi Road, Jiujiang Economic Development Zone, Wuhu City, Anhui Province
Product Name:	Shredder
Trade Name:	N/A
Model :	WE-D, WE-S, WE-F, WE-C
Prepared By :	BST Testing (Shenzhen) Co., Ltd. No.7 New Era Industrial Zone, Guantian Bao' an District, Shenzhen, Guangdong, China
Test Date:	Sep. 06, 2024 - Sep. 18, 2024
Date of Report :	Sep. 18, 2024
Report No.:	XDX19240316091801FAR



TEST REPORT

EN 60204-1

Safety of machinery – Electrical equipment of machines

Part 1: General requirements

EN ISO12100:2010

Safety of machinery- General principles for design

- Risk assessment and risk reduction

Testing Laboratory Name	BST Testing (Shenzhen) Co., Ltd.
Address	No.7 New Era Industrial Zone, Guantian Bao' an District, Shenzhen, Guangdong, China
Testing location	BST Testing (Shenzhen) Co., Ltd.
Applicant's Name	Anhui Well Advanced Technology Co.,Ltd
Address	No. 23 Weisi Road, Jiujiang Economic Development Zone, Wuhu City, Anhui Province
Test specification	
Standard	EN 60204-1:2018 EN ISO12100:2010
Directive regulations	Machinery Directive 2006/42/EC
Non-standard test method	N.A.
Test item description	Shredder
Model and/or type reference	WE-D, WE-S, WE-F, WE-C
Rating(s)	See Copy of marking plate
Manufacturer	Anhui Well Advanced Technology Co.,Ltd
Address	No. 23 Weisi Road, Jiujiang Economic Development Zone, Wuhu City, Anhui Province

**Test items particulars:**

Modifications allowed?.....	: Yes
Ambient temperature range (°C).....	: 40 °C
Humidity range.....	: 90% at 25°C
Altitude.....	:
Environmental requirements	: -15°C - +40°C
Radiation.....	: N.A.
Vibration, shock.....	: Agreement
Special installation and operation requirements.....	: User's Instruction
Anticipated voltage fluctuations (if more than ± 10 %).....	: ± 10 %
Anticipated frequency fluctuations (if more than in cl. 4.3.2).....	:
- specification of short-term value.....	: N.A.
Indicate of possible future changes in electrical equipment	: N.A.
Indicate for each source of electrical supply the requirements.....	:
- nominal voltage (V).....	: 380V~
- number of phases.....	: Three phase
- frequency.....	: 50Hz
- fluctuations outside to values given in cl. 4.3.2.....	: Comply with cl. 4.3.2
Type of power supply earthing.....	: Yes
Electrical equipment to be connected to neutral (N).....	: /
- type and rating of overcurrent protective device.....	: /
- settings of protective device.....	: /
Supply disconnecting device.....	: AC
- disconnection of neutral (N) conductor required.....	: No
- link for neutral (N) permissible.....	: No
- type of disconnecting device to be provided.....	: Yes
Limit of power up to which three-phase AC-motors may be started directly across the incoming supply lines.....	: No
May number of motor overload detection devices be reduced.....	: N.A.
Where machine is equipped with local lighting.....	:
- highest permissible voltage.....	: N.A.
- if lighting circuit voltage is not obtained directly from the power supply, state preferred voltage	: N.A.
Functional identification.....	: N.A.



Inscriptions / special markings.....:	
- mark of certification.....:	Yes
- on electrical equipment.....:	Yes
- language	English
Technical documentation (media, language).....:	English
Size, location and purpose of ducts, open cable trays or cable-supports to be provided by the user.....:	N.A.
For which of following classes of persons is access to the interior of the switchgear cabinets required during normal operation of the equipment.....:	skilled electricians / instructed persons /
Locks with removable keys provided for fastening doors or covers	N.A.
Type of two-hand control to be provided.....:	
- where it is type III, time limit (max. 0,5 s) within which each pair of push-buttons are to be operated.....:	
Indicate special limitations on size or weight which affect the transport of a particular machine or controlgear assemblies to the installation site.....:	see user's manual
- maximum dimensions.....:	see user's manual
- maximum weight.....:	see user's manual
Repetition of manual controlled cycles of operation.....:	
- length of time expected that machine will be operated at this rate without subsequent pause.....:	Yes
Certificate for operating tests	
- with the loaded machine to be supplied (specially built machines).....:	Yes
- on a loaded prototype machine to be supplied (normal machines).....:	Yes
Time delay for cableless control systems.....:	
Specific method of conductor identification to be used	Yes
Test case verdicts	
Test case does not apply to the test object	N/A
Test item does meet the requirement	P(ass)
Test item does not meet the requirement	F(ail)

**General remarks**

This report shall not be reproduced except in full without the written approval of the testing laboratory.
The test results presented in this report relate only to the item(s) tested.
The series products have the same circuit diagram and functionality.

Copy of marking plate:

Double Shaft Shredder	
Model	WE-D
Drive method	Motor + Gearbox
Motor power	60-220kW
Shredding chamber length	1000-1600mm
Rotor blade thickness	30-50mm
Rotor blade diameter	∅ 330-600 mm
Rotor blade material	NiCrMo High alloy steel
Rotate Speed	7-20 rpm
Spacer & Counter blade material	45# steel
Shaft material	42CrMo High alloy steel
Sealing method	Quadruple seal, waterproof and <u>dustproof</u>
Voltage	3P-380V 50Hz / Customize
Electric cabinet	Siemens PLC control system

Product Name: Shredder

Model: WE-D

Rating(s): 380 V~, 50Hz



Anhui Well Advanced Technology Co.,Ltd

Made In China

Prepared by :

Fade Zhan

Engineer

Reviewer :

Jacky Zhang

Approved & Authorized Signer :





EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
6	Risk reduction		-
6.1	General		-
	The objective of risk reduction can be achieved by the elimination of hazards, or by separately or simultaneously reducing each of the two elements that determine the associated risk: -severity of harm from the hazard under consideration -probability of occurrence of that harm All protective measures intended for reaching this objective shall be applied in the following sequence, referred to as the three-step method(see also Figures 1 and 2)	This requirement is complied with. See related clauses.	Pass
6.2	Inherently safe design measures		-
6.2.1	General		-
	Inherently safe design measures are the first and most important step in the risk reduction process because protective measures inherent to the characteristics of the machine are likely to remain effective, whereas experience has shown that even well-designed safeguarding may fail or be violated and information for use may not be followed.	Appropriate machine design has been performed by the manufacturer.	Pass
	Inherently safe design measures are achieved by avoiding hazards or reducing risks by a suitable choice of design features of the machine itself and/or interaction between the exposed persons and the machine. NOTE See 6.3 for safeguarding and complementary measures that can be used to achieve the risk reduction objectives in the case where inherently safe design measures are not sufficient (see 6.1 for the three-step method).	Appropriate machine design has been performed by the manufacturer.	Pass
6.2	Consideration of geometrical factors and physical aspects		-
6.2.2.1	Geometrical factors such factors include the following.		-



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	<p>a) The form of machinery is designed to maximize direct visibility of the working areas and hazard zones from the control position—reducing blind spots, for example—and choosing and locating means of indirect vision where necessary(mirrors, etc.) so as to take into account the characteristics of human vision, particularly when safe operation requires permanent direct control by the operator, for example:</p> <ul style="list-style-type: none">-the travelling and working area of mobile machines;-the zone of movement of lifted loads or of the carrier of machinery for lifting persons;-the area of contact of the tool of a hand-held or hand-guided machine with the material being worked. <p>The design of the machine shall be such that, from the main control position, the operator is able to ensure that there are no exposed persons in the danger zones.</p>	Appropriate machine design has been performed by the manufacturer.	Pass
	<p>b) The form and the relative location of the mechanical components parts: for instance, crushing and shearing hazards are avoided by increasing the minimum gap between the moving parts, such that the part of the body under consideration can enter the gap safely, or by reducing the gap so that no part of the body can enter it (see ISO 13854 and ISO 13857).</p>	Appropriate machine design has been performed by the manufacturer.	Pass
	<p>c) Avoiding sharp edges and corners, protruding parts: in so far as their purpose allows, accessible parts of the machinery shall have no sharp edges, no sharp angles, no rough surfaces, no protruding parts likely to cause injury, and no openings which can “trap” parts of the body or clothing. In particular, sheet metal edges shall be deburred, flanged or trimmed, and open ends of tubes which can cause a “trap” shall be capped.</p>	Appropriate machine design has been performed by the manufacturer.	Pass
	<p>d) The form of the machine is designed so as to achieve a suitable working position and provide accessible manual controls (actuators).</p>	Appropriate machine design has been performed by the manufacturer.	Pass
6.2.2.2	Physical aspects		-
	Such aspects include the following:		-



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	a) limiting the actuating force to a sufficiently low value so that the actuated part does not generate a mechanical hazard;	The actuating force has been limited to be a sufficiently low value so that the actuated part does not generate a mechanical hazard.	Pass
	b)limiting the mass and/or velocity of the movable elements, and hence their kinetic energy;	This have been limited.	Pass
	- c) limiting the emissions by acting on the characteristics of the source using measures for reducing 1) noise emission at source (see ISO/TR 11688-1), 2) the emission of vibration at source, such as redistribution or addition of mass and changes of process parameters [for example, frequency and/or amplitude of movements (for hand-held and hand-guided machinery, see CR 1030-1)], 3) the emission of hazardous substances, including the use of less hazardous substances or dust-reducing processes (granules instead of powders, milling instead of grinding), and 4) radiation emissions including, for example, avoiding the use of hazardous radiation sources, limiting the power of radiation to the lowest level sufficient for the proper functioning of the machine, designing the source so that the beam is concentrated on the target, increasing the distance between the source and the operator or providing for remote operation of the machinery [measures for reducing emission of non-ionizing radiation are given in 6.3.4.5 (see also EN 12198-1 and EN 12198-3)].	The emissions by acting on the characteristics of the source have been limited.	Pass
6.2.3	Taking into account the general technical knowledge regarding machine design This general technical knowledge can be derived from technical specifications for design (e.g. standards, design codes, calculation rules).These should be used to cover :		N/A
	a) mechanical stresses such as		-
	-stress limitation by implementation of correct calculation, construction and fastening methods as regards, e.g. bolted assemblies, welded assemblies	Has been taken into account.	Pass



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	-stress limitation by overload prevention, (e.g. "fusible" plugs, pressure-limiting valve, breakage points, torque-limiting devices);	Has been taken into account.	Pass
	- avoiding fatigue in elements under variable stresses (notably cyclic stresses) ;	Has been taken into account	Pass
	- static and dynamic balancing of rotating elements;	Has been taken into account	Pass
	b) materials and their properties such as		-
	- resistance to corrosion, ageing, abrasion and wear;	It has appropriate coating	Pass
	- hardness, ductility, brittleness;	The materials have been treated by appropriate methods	Pass
	- homogeneity	The materials have been treated by appropriate methods	Pass
	- toxicity	The materials is non-toxicity	Pass
	- flammability	The materials no flammability	Pass
	c) emission values for:		-
	- noise;	No noise will result in hazard in this machine.	Pass
	- vibration;	No vibration will result in hazard in this machine.	Pass
	- hazardous substances;	No hazardous substances will result in hazard in this machine.	Pass
	- radiation.	No radiation will result in hazard in this machine.	Pass
	When the reliability of particular components or assemblies is critical for safety (e.g. ropes, chains, lifting accessories for lifting loads or persons), stress values shall be multiplied by appropriate working coefficients.	Appropriate working coefficients have been taken into account during design and calculation.	Pass
6.2.4	Choice of an appropriate technology		N/A
	One or more hazards can be eliminated or risks reduced by the choice of the technology to be used in certain applications, e. g.:		N/A
	a)on machines intended for use in explosive atmospheres: -fully pneumatic or hydraulic control system and machine actuators: -"intrinsically safe" electrical equipment (see IEC60079-11)		Not applicable



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	b)for particular products to be processed such as a solvent:equipment assuring that the temperature will remain far below the flash point.		Not applicable
	c)alternative equipment to avoid high noise level, e.g.: -electrical instead of pneumatic equipment - in certain conditions,water cutting instead of mechanical equipment.		Not applicable
6.2.5	Applying the principle of the positive mechanical action		-
	Positive mechanical action is achieved when a moving mechanical component inevitably moves another component along with it, either by direct contact or via rigid elements. An example of this positive opening operation of switching devices in an electrical circuit (see IEC 60947-5-1 and ISO 14119)	The principle of the positive mechanical action of a component on another component has been applied	Pass
6.2.6	Provisions for stability		-
	Machines shall be designed to have sufficient stability to allow them to be used safely in their specified conditions of use.	Satisfied it.	Pass
	Factors to be taken into account include		-
	-geometry of the base; -weight distribution,including loading; -dynamic forces due to movements of parts of the machine itself,or of elements held by the machine which may result in an overturning moment; -vibration	Taken into account during design.	Pass
	-oscillations of the centre of gravity;		Not applicable
	-characteristics of the supporting surface in case of traveling or installation on different sites (e.g.ground conditions,slope);	Taken into account during design.	Pass
	-external forces (e.g.wind pressure,manual forces)	Taken into account during design.	Pass
	Stability shall be considered in all phases of the life of the machine,including handling, traveling,installation,use,de-commissioning and dismantling.	Taken into account during design.	Pass
	Other protective measures for stability relevant to safeguarding are given in 6.3.2.6	Please see the related clause.	Pass
6.2.7	Provision for maintainability		-
	When designing a machine,the following maintainability factors shall be taken into account:		-



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	-accessibility,taking into account the environment and the human body measurements,including the dimensions of the working clothes and tools used;	These factors have been taken into account during design.	Pass
	-ease of handling,taking into account human capabilities;	These factors have been taken into account during design.	Pass
	-limitation ofthe number of special tools and equipment;	These factors have been taken into account during design.	Pass
6.2.8	Observing ergonomic principles	-	-
	Ergonomic principles shall be taken into account in designing machinery to reduce mental or physical stress and strain of the operator.	Appropriate ergonomic principles have been taken into account in designing machinery	Pass
	These principles shall be considered when allocating functions to operator and machine (degree of automation) in the basic design.	These principles have been taken into account during allocating functions to operator and machine.	Pass
	Account shall be taken of body sizes likely to be found in the intended user population, strengths and postures, movement amplitudes, frequency of cyclic actions (see ISO 10075 and ISO 10075-2)	All these factors have been taken into account during design.	Pass
	All elements of the "operator-machine" interface such as controls, signaling or data display elements, shall be designed to easily understood so that clear and unambiguous interaction between the operator and the machine is possible.(see EN 614-1, ISO 6385, EN 13861 and IEC 61310-1)	All arrangement and design of manual controls have been checked in compliance with.	Pass
	Designer's attention is especially drawn to following ergonomic aspects of machine design		N/A
	a)Avoiding stressful postures and movements during use of the machine (e.g.by providing facilities to adjust the machine to suit the various operators).	Stressful postures and movements during use of the machine have been avoided.	Pass
	b) Designing machines, and more especially hand-held and mobile machines to enable them to be operated easily taking into account human effort, actuation of controls and hand, arm and leg anatomy.	This machine has been adjusted to the human strength and convenient movement.	Pass
	c) Limit as far as possible noise, vibration and thermal effects such as extreme temperature	This machine with low noise, low vibration.	Pass
	d) Avoid linking the operator's working rhythm to an automatic succession of cycles.	This situation has been avoided.	Pass



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	e) Providing local lighting on or in the machine for the illumination of the working area and of adjusting, setting-up, and frequent maintenance zones when the design features of the machine and/or its guards render the ambient lighting inadequate. Flicker, dazzling, shadows and stroboscopic effects shall be avoided if they can cause a risk. If the position of the lighting source has to be adjusted, its location shall be such that it does not cause any risk to persons making the adjustment.		Not applicable
	f) Select, locate and identify manual controls(actuators) so that		N/A
	- they are clearly visible and identifiable and appropriately marked where necessary(see 6.4.4)	All design and arrangement are compliance with this requirement.	Pass
	- they can be safely operated without hesitation or loss of time and without ambiguity(e.g. a standard layout of controls reduces the possibility of error when an operator changes from a machine to another one of similar type having the same pattern of operation)	All design and arrangement of the control logic have been checked in compliance with this requirement.	Pass
	-their location(for push-buttons) and their movement (for levers and handwheels) are consistent with their effect (see IEC 61310-3)	All the function has been checked in compliance with this requirement.	Pass
	Where a control is designed and constructed to perform several different actions, namely where there is no one-to-one correspondence (e.g. keyboards), the action to be performed shall be clearly displayed and subject to confirmation where necessary.		N/A
	Controls shall be so arranged that their layout, travel and resistance to operation are compatible with the action to be performed, taking account of ergonomic principles.	All the arrangement of the control logic have been checked in compliance with this requirement	Pass
	Constraints due to the necessary or foreseeable use of personal protective equipment(such as footwear, gloves)shall be taken into account.	There factors have been taken into account during design.	Pass
	g)Select, design and locate indicators, dials and visual display units so that		N/A
	-they fit within the parameters and characteristics of human perception		Pass



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	-information displayed can be detected, identified and interpreted conveniently, i.e. long lasting, distinct, unambiguous and understandable with respect to the operator's requirements and the intended use;	All the information displayed comply with this requirement	Pass
	-the operator is able to perceive them from the control position		Pass
6.2.9	Preventing electrical hazard		N/A
	For the design of the electrical equipment of machines IEC 60201-1 gives general provisions, especially in clause 6 for protection against electric shock.	Please also make reference to EN 60204-1 test report.	N/A
	For requirements related to specific machines, see corresponding IEC standards(e.g. series of IEC 61029, IEC 60745, IEC 60335).		Not applicable
6.2.10	Preventing and hydraulic hazards		-
	Pneumatic and hydraulic equipment of machinery shall be designed so that:		N/A
	-the maximum rated pressure cannot be exceeded in the circuits(e.g. by means of pressure limiting devices)	Appropriate limiting devices have been provided.	Pass
	-no hazard results from pressure surges or rises, pressure losses or drops or losses of vacuum;	No such hazards exist.	Pass
	-no hazardous fluid jet or sudden hazardous movement of the hose (whiplash)results from leakage or component failures;		Not applicable
	-air receivers, air reservoirs or similar vessels(e.g. in gas loaded accumulators)comply with the design rules for these elements;	The devices are designed appropriately.	Pass
	-air elements ofthe equipment, and especially pipes and hoses, be protected against harmful external effects;	The pipes have been protected by appropriated devices.	Pass
	-as far as possible, reservoirs and similar vessels (e.g. in gas loaded accumulators)are automatically depressurized when isolating the machine from its power supply (see 6.3.5.4) and, if it is not possible, means are provided for their isolation, local depressurizing and pressure indication (see also ISO 14118, clause 5)	This requirement is complied with	Pass



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	- all elements which remain under pressure after isolation of machine from its power supply be provided with clearly identified exhaust devices, and a warning label drawing attention to the necessity of depressurizing those elements before any setting or maintenance activity on the machine. See also ISO 4413 and ISO 4414	This requirement is complied with by appropriate design.	Pass
6.2.11	Applying inherently safe design measures to control system		-
6.2.11.1	General		-
	The design measures of the control system shall be chosen so that their safety-related performance provides a sufficient amount of risk reduction (see ISO 13849-1 or IEC 62061)	Inherently safe design measures to control system have applied.	Pass
	The correct measures of the control systems can avoid unforeseen and potentially hazardous machine behaviour.	Inherently safe Design measures to control system have applied.	Pass
	-an unsuitable design or modification (accidental or deliberate) of the control system logic;	No this kind of hazard in this machine	Pass
	- a temporary or permanent defect or a failure of one or several components of the control system;		Pass
	- a variation or a failure in the power supply of the control system;	No this kind of hazard in this machine.	Pass
	- inappropriate selection, design and location of the control devices;	No this kind of hazard in this machine.	Not applicable
	Typical examples of hazardous machine behaviour are:		N/A
	- unintended/unexpected start-up (see ISO 14188)	No this kind of hazard.	Pass
	- uncontrolled speed change;	No this kind of hazard.	Pass
	- failure to stop moving parts;	No this kind of hazard.	Pass
	- dropping or ejection of a mobile part of the machine or of a workpiece clamped by the machine;	No this kind of hazard.	Pass
	- machine action resulting from inhibition (defeating or failure) of protective devices	No this kind of hazard.	Pass
	In order to prevent hazardous machine behaviour and to achieve safety functions, the design of control systems shall comply with the principles and methods presented in this subclause 6.2.11 and in 6.2.12.	The design of control systems comply with the related principles and methods	Pass



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	These principles and methods shall be applied singly or in combination as appropriate to the circumstances (see ISO 13849-1 and EN 60204-1 and IEC 62061).	Please see the related clause.	Pass
	Control systems shall be designed to enable the operator to interact with the machine safely and easily; this requires one or several of the following solutions;		N/A
	-systematic analysis of start and stop conditions;	Systematic analysis have been applied.	Pass
	-provision for specific operating modes (e.g. start-up after normal stop. restart after cycle interruption or after emergency stop. removal of the workpieces contained in the machine, operation of a part of the machine in case of a failure of a machine element)	Enough provisions have been provided.	Pass
	-clear display of the faults;		Pass
	-measures to prevent accidental generation of unexpected start commands (e.g. shrouded start device) likely to cause dangerous machine behaviour (see ISO 14118 figure 1)	Main switch with lock and related devices are provided.	Pass
	-maintained stop commands (e.g. interlock) to prevent restarting that could result in dangerous machine behaviour (see ISO 14118:2000, figure 1)	This requirement is complied with.	Pass
	An assembly of machines may be divided into several zones for emergency stopping, for stopping as a result of protective devices and/or for isolation and energy dissipation.		Not applicable
	The different zones shall be clearly defined and it shall be obvious which parts of the machine belong to which zone.		Not applicable
	Likewise it shall be obvious which control devices (e.g. emergency stop devices, supply disconnecting devices) and/or protective devices belong to which zone.		Not applicable
	The interfaces between zones shall be designed such that no function in one zone creates hazards in another zone which has been stopped for an intervention.		Not applicable
	Control systems shall be designed to limit the movements of parts of the machinery, the machine itself, or workpieces and/or loads held by the machinery, to the safe design parameters (e.g. range, speed, acceleration, deceleration, load capacity). Allowance shall be made for dynamic effects (e.g. the swinging of loads).		Not applicable



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	For example:		-
	-the traveling speed of mobile pedestrian controlled machinery other than remote-controlled shall be compatible with walking speed.		Not applicable
	-the range, speed, acceleration and deceleration of movements of the person-carrier and carrying vehicle for lifting persons shall be limited to non-hazardous values, taking into account the total reaction time of the operator and the machine.		Not applicable
	-the range of movements of parts of machinery for lifting loads shall be kept within specified limits.		Not applicable
	When machinery is designed to use synchronously different elements which can also be used independently the control system shall be designed to prevent risks due to lack of synchronization.		Not applicable
6.211.2	Starting of internal power source/switching on an external power supply.		N/A
	The starting of an internal power source or switching-on of an external power supply shall not result in a hazardous situation. For example: -starting the internal combustion engine shall not lead to movement of a mobile machine; -connection to mains electricity supply shall not result in the starting of working parts of a machine. See EN 60204-1, 7.5 (see also Annexes A and B).	Please also make reference to EN 60204-1 test report.	N/A
6.2.11.3	Starting/stopping of a mechanism		-
	The primary action for starting or accelerating the movement of a mechanism should be performed by passage from state 0 to state 1 (if state 1 represents the highest energy state)	This requirement has been taken into account during design.	Pass
	The primary action for stopping or slowing down should be performed by removal or reduction of voltage or fluid pressure, or, if binary logic elements are considered, by passage from state 1 to 0 (if state 1 represents the highest energy state).	The type of stopping of this machine belongs to state 1 and state 0.	Pass



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	When, in order for the operator to maintain permanent control of deceleration, this principle not observed(e.g. a hydraulic braking vice of a self-propelled mobile machine),the machine shall be equipped with a means of slowing and stopping in case of failure of the main braking system	No such situation exist.	Pass
6.2.11.4	Restart after power interruption		-
	If it may generate a hazard,the spontaneous restart of a machine when it is re—energized alter power interruption shall be prevented (e.g. by use of a self-maintained relay, contactor or valve).	The spontaneous restart of amachine when it is re-energized after power interruption has been prevented by contactor.	N/A
6.2.11.5	Interruption of power supply situations resulting from interruption or excessive fluctuation of the power supply. At least the following requirements shall be met:	Machinery shall be designed to prevent hazardous	N/A
	-the stopping function of the machinery shall remain :		N/A
	-all devices whose permanent operation is required for safety shall operation an effective way to maintain safety(e.g. locking, clamping devices, cooling or heating devices, power-assisted steering of self-propelled mobile machinery);		N/A
	-parts of machinery or workpieces and/or loads held by machinery which are liable to move as a result of potential energy shall be retained for the time necessary to allow them to be safely lowered	No such situation exists.	N/A
6.2.11.6	Use of automatic monitoring		N/A
	Automatic monitoring is intended to ensure that a safety function(s) implemented by a protective measure do(es) not fail to be performed if the ability of a component or an element to perform its function is diminished ,or if the process conditions are	Appropriate automatic monitoring has been used.	N/A
	Automatic monitoring either detects a fault immediately or carries out periodic checks so that a fault is detected before the next demand upon the safety function.	Appropriate automatic monitoring has been used	N/A
	In either case, the protective measure can be initiated immediately or delayed until a specific event occurs (e.g. the beginning of the machine cycle) The protective measures may be, e.g.:	Appropriate automatic monitoring has been used.	N/A
	-the stopping of the hazardous process:	Emergency stop is provided	N/A



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	-preventing the re-start of this process after the first stop following the failure;	Reset before restart is necessary	N/A
	-the triggering of an alarm		Not applicable
6.2.11.7	Safety functions implemented by programmable electronic control systems		N/A
6.2.11.7.1	General		N/A
	A control system including programmable electronic equipment(e.g. programmable controllers)can be used to implement safety functions machinery		N/A
	equipment(e.g. programmable controllers) can be used to implement safety functions machinery	safety functions are considered during design	N/A
	The design of the programmable electronic control system shall be such that the probability of random hardware failures and the likelihood of systematic failures that can adversely affect the performance of the safety—related control function(s)are sufficiently low	safety functions are considered during design	N/A
	Where a programmable electronic control system performs a monitoring function, the system behaviour on detection of a fault shall be considered(see also IEC 61 508 series for further guidance)	satisfied this	N/A
	The programmable electronic control system should be installed and validated to ensure that the specified performance(e.g. safety integrity level(SIL)in IEC 61 508 series)for each safety function has been achieved	it be installed and validated to ensure that the specified performance	N/A
	Validation comprises testing an analysis(e.g. static,dynamic or failure analysis)to show that all parts interact correctly to perform the safety function and that unintended functions do not occur	All parts interact correctly to perform the safety function and that unintended functions do not occur	N/A
6.2.11.7.2	Hardware aspects		N/A
	The hardware(including e.g. sensors, actuators,logic solvers)shall be selected (and/or designed)and installed to meet both the functional and performance requirements of the safety function(s)to be performed, in particular,by means of:	The hardware has been selected and installed to meet both the functional and performance requirements of the safety functions to be performed	N/A
	-architectural constraints(e.g. the configuration of the system, its ability to tolerate faults, its behaviour on detection of a fault):	Appropriate devices are provided	N/A



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	-selecting (and/or designing) equipment and devices with an appropriate probability of dangerous random hardware failure;	Appropriate devices are provided	N/A
	Incorporating measures and techniques within the hardware to avoid systematic failures and control systematic faults.	Appropriate devices are provided.	N/A
6.2.11.7.3	Software aspects		N/A
	The software (including internal operating software (or system software) and application software) shall be designed so as to satisfy the performance specification for the safety functions (see also IEC 61508-3)	It has PLC.	N/A
	Application software		-
	Application software should not be re-programmable by the user.	Not applicable	Not applicable
	This may be achieved by use of embedded software in a non re-programmable memory (e.g. micro-controller, application specific integrated circuit (ASIC))	Not applicable	Not applicable
	When the application requires reprogramming by the user, the access o the software dealing with safety functions should be restricted e.g. by : -locks; -passwords for the authorized persons		Not applicable
6.2.11.8	Principles relating to manual control		-
	a)Manual control devices shall be designed and located according to the relevant ergonomic principles given in 6.2.8	Manual control devices have been designed and located according to the relevant ergonomic principles given in 4.8.7	Pass
	b)A stop control device shall be placed near each start control device. Where the start /stop function is performed by means of a hold-to-run control, a separate stop control device shall be provided when a risk can result from the hold-to-run control device failing to deliver a stop command when released.	A stop control device has been placed near each start control device.	Pass
	c) Manual controls shall be located out of reach of the danger zones (see IEC 61310-3), except for certain controls where, of necessity, they are located within a danger zone, such as emergency stop or teach pendant.	Manual controls have been located out of reach of the danger zones.	Pass



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	d)Whenever possible, control devices and control positions shall be located so that the operator is able to observe the working area or hazard zone.	The control devices and control positions have been located so that the operator is able to observe the working area or hazard zone.	Pass
	The driver of a ride-on mobile machine shall be able to actuate all control devices required to operate the machine from the driving position, except for functions which can be controlled more safely from other positions.		Not applicable
	On machinery intended for lifting persons, controls for lifting and lowering and, if appropriate, for moving the carrier, shall generally be located in the carrier. If safe operation requires controls to be situated outside the carrier, the operator in the carrier shall be provided with the means of preventing hazardous movements.		Not applicable
	e) if it is possible to start the same hazardous element by means of several controls, the control circuit shall be so arranged that only one control is effective at a given time. This applies especially to machines which can be manually controlled unit (teach pendant, for instance), with which the operator may enter danger zones.		Not applicable
	f) Control actuators shall be designed or guarded so that their effect, where a risk is involved, cannot occur without intentional operation (see ISO 9355-1 and ISO 447)	This requirement is complied with.	Pass
	g) For machine functions whose safe operation depends on permanent, direct control by the operator, measures shall be taken to ensure the presence of the operator at the control position, e.g. by the design and location of control devices.	This requirement is complied with.	Pass
	g) For machine functions whose safe operation depends on permanent, direct control by the operator, measures shall be taken to ensure the presence of the operator at the control position, e.g. by the design and location of control devices.	This requirement is complied with.	Pass
	h) For cableless control an automatic stop shall be performed when correct control signals are not received, including loss of communication(see EN 60204-1)		Not applicable



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
6.2.11.9	Control mode for setting, teaching, process changeover, fault-finding, cleaning or maintenance		Not applicable
	Where, for setting, teaching, process changeover, fault-finding, cleaning or maintenance of machinery, a guard has to be displaced or removed and /or a protective device has to be disabled, and where it is necessary for the purpose of these operations for the machinery or part of the machinery to be put in operation, safety of the operator shall be achieved using a specific control mode which simultaneously:		Not applicable
	-disables all other control modes;		Not applicable
	-permits operation of the hazardous elements only by continuous actuation of an enabling device, a hold-to-run control device or a two –hand control device;		Not applicable
	-permits operation of the hazardous elements only in reduced risk conditions (e.g. reduced speed, reduced power/force, step-operation, e. g. with a limited movement control device)		Not applicable
	Prevents any operation of hazardous functions by voluntary or involuntary action on the machine’s sensors.		Not applicable
	This control mode shall be associated with one or more of following measures:		Not applicable
	-restriction of access to the danger zone as far as possible.		Not applicable
	-emergency stop control within immediate reach of the operator;		Not applicable
	Portable control unit(teach pendant)and/or local controls allowing sight of the controlled elements.(see IEC60204-1:9.2.4)		Not applicable
6.2.11.10	Selection of control and operating modes		-
	If machinery has been designed and built to allow for its use in several control or operating modes requiring different protective measures and /or work procedures(e.g. to allow for adjustment, setting, maintenance, inspection),it shall be fitted with a mode selector which can be locked in each position.		Not applicable
	Each position of the selector shall be clearly identifiable and shall exclusively allow one control or operating mode.		Not applicable



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	The selector may be replaced by another selection means which restricts the use of certain functions of the machinery to certain categories of operators (e.g. access codes for certain numerically controlled functions).		Not applicable
6.211.11	Applying measures achieve electromagnetic Compatibility		-
	For guidance on electromagnetic compatibility, see IEC60204-1, and IEC61000-6 series		Not applicable
6.2.11.12	Provision of diagnostic systems to aid fault-finding		-
	Diagnostic systems to aid fault finding should be included in the control system so that there is no need to disable any protective measures		Not applicable
6.2.12	Minimizing the probability of failure of safety functions		-
6.2.12.1	General		-
	Safety of machinery is not only dependent on the reliability of the control systems but also on the reliability of all parts of the machine. The continued operation of the safety functions is essential for the safe use of the machine. This can be achieved by:		Pass
6.2.12.2	Use of reliable components		N/A
	"Reliable component" means components which are capable of withstanding all disturbances and stresses associated with the usage of the equipment in the conditions of intended use (including the environmental conditions), for the period of time or the probability of operations fixed for the use, with a low probability of failures generating a hazardous malfunctioning of the machine. Components shall be selected taking into account all factors mentioned above (see also 6.2.13)	Reliable components have been used	N/A
6.2.12.3	Use of "oriented failure mode" components		-
	"Oriented failure mode" components or systems are those in which the predominant failure mode is known in advance and which can be used so that such a failure leads to a non-hazardous alteration of the machine function		Not applicable
	The use of such components should always be considered particularly in cases where redundancy is (see 6.2.12.4) not employed		Not applicable



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
6.2.12.4	Duplication(or redundancy)of components or subsystems		Not applicable
	In the design of safety-related parts of the machine, duplication(or redundancy) of components may be used so that if one component fails, another component(or other components) continue(s) to perform its(their) function, thereby ensuring that the safety function remains available		Not applicable
	In order to allow the proper action to be initiated, component failure shall be preferably detected by automatic monitoring (see 6.2.1 1.6) or in some circumstances by regular inspection,		Not applicable
	provided that the inspection interval is shorter than the expected lifetime of the components.		Not applicable
	Diversity of design and/or technology can be used to avoid common cause failures (e.g. from electromagnetic disturbance) or common mode failures.		Not applicable
6.2.13	Limiting exposure to hazards through reliability of quipment		N/A
	Increased reliability of all component parts of machinery reduces the frequency of incidents requiring rectification, thereby reducing exposure to hazards.	This requirement is complied with.	N/A
	This applies to power systems (operative part) as well as to control systems, to safety functions as well as to other functions of machinery.	This requirement is complied with.	N/A
	Safety-critical components (as e.g. certain sensors) with known reliability shall be used.	Safety-critical components are used in this machine .	N/A
	The elements of guards and of protective services shall be particularly reliable, as their failure can expose persons to hazards, and also as poor reliability would encourage attempts to defeat them.	This requirement is complied with.	N/A
6.2.14	Limiting exposure to hazards through mechanization or automation of loading(feeding) /unloading (removal) operations		N/A
	Mechanization and automation of machine loading/unloading operations and more generally of handling operations (of work pieces, materials, substances) limit the risk generated by these operations by reducing the exposure of persons to hazards at the operating points.	This requirement is complied with.	N/A



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	Automation can be achieved e.g. by robots, handling devices, transfer mechanisms, air blast equipment.	This requirement has been complied with by design.	N/A
	Mechanization can be achieved, e.g. by feeding slides, push rods, hand-operated indexing tables.	This requirement has been complied with by design.	N/A
	While automatic feeding and removal devices have much to offer in preventing accidents to machine operators, they can create danger when any faults are being rectified.	Appropriate provisions have been provided.	N/A
	Care shall be taken to ensure that the use of these devices does not introduce further hazards (e.g. trapping, crushing) between the devices and parts of the machine or workpieces/materials being processed.	These devices will not introduce further hazards	N/A
	Suitable safeguards (see 6.3) shall be provided if this cannot be ensured.	Please see the related clause	N/A
	Automatic feeding and removal devices with their own control systems and the control systems of the associated machine shall be interconnected after thoroughly studying how all safety functions are performed in all control and operation modes of the whole equipment.	This requirement has been complied with by design	N/A
6.2.15	Limiting exposure to hazards through location of the setting and maintenance points outside of danger zones.		N/A
	The need for access to danger zones shall be minimized by locating maintenance, lubrication and setting points outside these zones.	This requirement has been complied with by design.	Pass
6.3	Safeguarding and complementary protective measures		-
6.3.1	General		-
	Guards and protective devices shall be used to protect persons whenever inherently safe design does not reasonably make it possible either to remove hazards or to sufficiently reduce risks. Complementary protective measures involving additional equipment (e.g. emergency stop equipment) may have to be implemented.	Appropriate guards and protective devices have been used to protect persons whenever inherently safe design does not reasonably make it possible either to remove hazards or to sufficiently reduce risks.	Pass
	The different kinds of guards and protective devices are defined in 3.27 and 3.28.	Please see the related clause	Pass



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	Certain safeguards may be used to avoid exposure to more than one hazard (e.g. a fixed guard preventing access to a zone where a mechanical hazard is present being used to reduce noise level and collect toxic emissions)	Such safeguards exist	Pass
6.3.2	Selection and implementation of guards and protective devices		-
6.3.2.1	General		-
	This subclause gives guidelines for the selection and the implementation of guards and protective devices the primary purpose of which is to protect persons against hazard generated by moving parts, according to the nature of those parts(see figure 4)and to the need for access to the danger zone(s)	Please see the related clause	Pass
	The exact choice of a safeguard for a particular machine shall be made on the basis of the risk assessment for that machine	Please see the related clause.	Pass
	In selecting an appropriate safeguard for a particular type of machinery or hazard zone, it shall be borne in mind that a fixed guard is simple and shall be used where access of an operation (operation without any malfunction) of the machinery.		Pass
	As the need for frequency of access increase this inevitably leads to the fixed guard not being replaced	This requirement is complied with	Pass
	This requires the use of an alternative protective measure (movable interlocking guard, sensitive protective equipment.)	Movable interlocking guard is used.	Pass
	A combination of safeguards may sometimes be required. For example, where, in conjunction with a fixed guard, a mechanical loading(feeding) device is used to feed a workpiece into a machine, thereby removing the need for access to the primary hazard zone, a trip device may be requiring hazard between the secondary drawing-in or shearing hazard between the mechanical loading(feeding) device, when reachable, and the fixed guard.		Not applicable
	Consideration shall be given enclosure of control positions or intervention zones to provide combined protection against several hazards which may include:	This requirement has been taken into consideration.	Pass
	- hazards from falling or ejected objects(e.g. falling object protection structure)	No such hazards exist in this machine.	Pass



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	- emission hazards(e.g. protection against noise, vibration, radiation , harmful substances)	No such hazards exist in this machine.	Pass
	- hazards due to the environment(e.g. protection against heat, cold, foul weather)	No such hazards exist in this machine.	Pass
	- hazards due to tipping over or rolling over of machinery(e.g. roll-over or tip-over protection structure)	No such hazards exist in this machine.	Pass
	The design of such enclosed work stations(e.g. cabs and cabins) shall take into account ergonomic principles concerning visibility,lighting, atmospheric conditions, access, posture.	No such hazards exist in this machine.	Pass
6.3.2.2	Where access to the hazard zone is not required during normal operation		Pass
	Where access to the hazard zone is not required during normal operation of the machinery, safeguard should be selected from the following:		-
	a) fixed guard (see also ISO 14120)	Fixed guards are provided.	Pass
	b) interlocking guard with or without guard locking (see also 6.3.3.2.3, ISO 14119, ISO 14120);	Provided.	Pass
	c) self-closing guard (see ISO 14120, 3.3.2)		Not applicable
	d) sensitive protective equipment, e.g. electro-sensitive protective equipment (see IEC 61496) or pressure sensitive mat (see ISO 13856)		Not applicable
6.3.2.3	Where access to the hazard zone is required during normal operation		N/A
	Where access to the hazard zone is required during normal operation of the machinery , safeguards should be selected from the following:		N/A
	a)interlocking guard with or without guard locking (see also ISO 14119, ISO 14120 and 6.3.3.2.3 of this standard);		Not applicble.
	b)sensitive protective equipment, e.g electro-sensitive protective equipment (see IEC 61496)		Not applicable
	c)two-hand control device (see ISO 13851)		Not applicable
6.3.2.4	Where access to the hazard zone is required for machine setting, teaching, process changeover, fault finding, cleaning or maintenance.		-



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	As far as possible, machines shall be designed so that the safeguards provided for the protection of the production operator may ensure also the protection of personnel in charge of setting, teaching, process Changeover, fault finding, cleaning or maintenance without hindering them in performing their task.		Not applicable
	Such tasks shall be identified and considered in the risk assessment as parts of the use of the machine (see 5.2)		Not applicable
6.3.2.5	Selection and implementation of sensitive protective equipment		N/A
6.3.2.5.1	Selection		N/A
	Due to the great diversity of the technologies on which their detection function is based, all types of sensitive protective equipment are far from being equally suitable for safety applications.		N/A
	The following provisions are intended to provide the designer with criteria for selecting, for each application, the most suitable device(s).		N/A
	Types of sensitive protective equipment include, e.g.:		N/A
	- light curtains;		N/A
	- scanning devices as, e.g. laser scanners;		N/A
	- pressure sensitive mats;		N/A
	- trip bars, trip wires.		N/A
	Sensitive protective equipment can be used:		N/A
	- for tripping purposes;		N/A
	- for presence sensing;		N/A
	- for both tripping and presence sensing		N/A
	- to re-initiate machine operation, a practice which is subject to stringent conditions.		N/A
	The following characteristics of the machinery, among others, can preclude the sole use of sensitive protective equipment:		N/A
	- tendency for the machinery to eject materials or component parts;		N/A
	- necessity to guard against emissions (noise, radiation, dust, etc.)		N/A
	- erratic or excessive machine stopping time;		N/A
	- inability of a machine to stop part-way through a cycle.		N/A
6.3.2.5.2	Implementation		-
	consideration should be given to :		-



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	a) size, characteristics and positioning of the detection zone (see ISO 13855, which deals with the positioning of some types of sensitive protective equipment)		Not applicable
	b)reaction of the device to fault conditions (see IEC 61496 for electro-sensitive protective equipment)		Not applicable
	c)possibility of circumvention		Not applicable
	d)detection capability and its variation over the course of time (e.g. as a result of its susceptibility to different environmental conditions such as the presence of reflecting surfaces, other artificial light sources, sunlight or impurities in the air.		Not applicable
	sensitive protective equipment shall be integrated in the operative part and associated with the control system of the machine so that :		-
	- a command is given as soon as a person or part of a person is detected ;		Not applicable
	- the withdrawal of the person or part of a person detected does not, by itself, restart the hazardous machine function(s);therefore, the command given by the sensitive protective equipment shall be maintained by the control system until a new command is given ;		Not applicable
	- restarting the hazardous machine function(s) results from the voluntary actuation , by the operator, of a control device placed outside the hazard zone , where this zone can be observed by the operator ;		Not applicable
	-the machine cannot operate during interruption of the detection function of the sensitive protective equipment,except during muting phases ;		Not applicable
	- the position and the shape of detection field prevents,possibly together with fixed guards , a person or part of a person from entering the hazard zone ,or being present in it , without being detected .		Not applicable
6.3.2.5.3	Additional requirements for sensitive protective equipment when used for cycle initiation .		-



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	In this exceptional application, starting of the machine cycle is initiated by the withdrawal of a person or of the detected part of a person from the sensing field of the sensitive protective equipment , without any additional start command , hence deviating from the general requirement given in the second point of the dashed list in 6.3.2.5.2, above .After switching on the power supply ,or when the machine has been stopped by the tripping function of the sensitive protective equipment , the machine cycle shall be initiated only by voluntary actuation of a start control .		Not applicable
	Cycle initiation by sensitive protective equipment shall be subject to the following conditions :		-
	a)only active optoelectronic protective devices (AOPDs) complying with IEC 61496 series shall be used ;		Not applicable
	b) the requirements for an AOPD used as a tripping and presence-sensing device (see IEC 61496) are satisfied -in particular, location, minimum distance (see ISO 13855),detection capability, reliability and monitoring of control and braking systems;		Not applicable
	c) the cycle time of machine is short and the facility to re-initiate the machine upon clearing of the sensing field is limited to a period commensurate with a single normal cycle;		Not applicable
	d) entering the sensing field of the AOPD(s) or opening interlocking guards is the only way to enter the hazard zone;		Not applicable
	e) if there is more than one AOPD safeguarding the machine, only one of the AOPD(s) is capable of cycle re-initiation;		Not applicable
	f) with regard to the higher risk resulting from automatic cycle initiation, the AOPD and the associated control system comply with a higher safety-related performance than under normal conditions.		Not applicable
6.3.2.6	Protective measures for stability		-



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	If stability cannot be achieved by inherently safe design measures such as weight distribution(see 4.6), it will be necessary to maintain it by protective measures such as the use of:		-
	- anchorage bolts;		Pass
	- locking devices		Not applicable
	- movement limiters or mechanical stops;		Not applicable
	- acceleration or deceleration limiters;		Not applicable
	- load limiters;		Not applicable
	- alarms warning of the approach to stability or tipping limits;		Not applicable
6.3.2.7	Other protective devices		-
	When a machine requires continuous control by the operator(e. g. mobile machines, cranes) and an error of the operator can generate a hazardous situation, this machine shall be equipped with the necessary devices to enable the operation to remain within specified limits, in particular		Not applicable
	- when the operator has insufficient visibility of the hazard zone;		Not applicable
	- when the operator lacks knowledge of the actual value of a safety-related parameter (e. g. a distance, a speed, the mass of a load, the angle of a slope)		Not applicable
	-when hazards may result from operation other than those controlled by the operator;		Not applicable
	The necessary devices include:		-
	- devices for limiting parameters of movement (distance, angle, velocity , acceleration)		Not applicable
	- overloading and moment limiting devices:		Not applicable
	- devices to prevent collisions or interference with other machines;		Not applicable
	-device for preventing hazards to pedestrian operators of mobile machinery or other pedestrians:		Not applicable
	- torque limiting devices, breakage points to prevent excessive stress of components and assemblies;		Not applicable
	- devices for limiting pressure. temperature;		Not applicable
	- devices for monitoring emissions;		Not applicable
	- devices prevent operation in the absence of the operator at the control position;		Not applicable



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	- device to prevent lifting operations unless stabilizers are in place;		Not applicable
	- devices to ensure that components are in a safe position before traveling;		Not applicable
	Automatic protective measures triggered by such devices which take operation of the machinery out of the control of the operator (e.g. automatic stop of hazardous movement) should be preceded or accompanied by a warning signal to enable the operator to take appropriate action (see 6.4.3)		Not applicable
6.3.3	Requirements for the design of guards and protective devices		-
6.3.3.1	General requirements		-
	Guards and protective devices shall be designed to be suitable for the intended use taking into account mechanical and other hazards involved. Guards and protective devices shall be compatible with the working environment of the machine and designed so that they cannot be easily defeated. They shall provide the minimum possible interference with activities during operation and other phases of machine life, in order to reduce any incentive to defeat them.	Guards and protective devices have been appropriately designed.	Pass
	Guards and protective devices shall :		-
	- be of robust construction.	This requirement has been taken into account during design.	Pass
	- not give rise to any additional hazard;	This requirement has been taken into account during design.	Pass
	-not be easy to by-pass or render non-operational;	This requirement has been taken into account during design.	Pass
	-be located at an adequate distance from the danger zone (see ISO 13857 and ISO 13855).	This requirement has been taken into account during design.	Pass
	-cause minimum obstruction to the view of the production process:	This requirement has been taken into account during design.	Pass
	-enable essential work to be carried out on installation and/or replacement of tools and also for maintenance by allowing access only to the area where the work has to be done, if possible without the guard or protective device having to be moved;	This requirement has been taken into account during design.	Pass



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	For openings in the guards see ISO 13857	This requirement has been taken into account during design.	Pass
6.3.3.2	Requirements for fixed guards		-
6.3.3.2.1	Functions of guards		-
	The functions that guards can achieve are:	These functions are achieved by fixed guards.	Pass
	-prevention of access to the space enclosed by guard and/or . -containment/capture of materials, workpieces, chips, liquids which may be ejected or dropped by the machine and reduction of emissions(noise, radiation, hazardous substances such as dust, fumes, gases)which may be generated by the machine.	These functions are achieved by fixed guards.	Pass
	Additionally, they may need to have particular properties relating to electricity, temperature, fire, explosion, vibration, visibility(see ISO 14120) and operator position ergonomics(e.g. usability, operator's movements, posture, repetitive movements).	These functions are achieved by fixed guards.	Pass
6.3.3.2.2	Requirements for fixed guards		-
	Fixed guards shall be securely held in place:		-
	- either permanently (e.g. by welding) -or by means of fasteners (screws, nuts) making removal/opening impossible without using tools; they should not remain closed without their fasteners (see ISO 14120)	All the fixed guards are securely held in place by appropriate fasteners.	Pass
6.3.3.2.3	Requirements for movable guards		-
	a)movable guards which provide protection against hazards generated by moving transmission parts shall:		-
	-as far as possible remain fixed to the machinery or other structure (generally by means of hinges or guides) when open;	Gemels are used for the movable guards.	Pass
	-be interlocking guards (with guard locking when necessary) (see ISO 14119)		Not applicable
	b) movable guards against hazards generated by non-transmission moving parts shall be designed and associated with the machine control system so that;		N/A



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	- moving parts cannot start up while they are within the operator's reach and the operator cannot reach moving parts once they have start up; this can be achieved by interlocking guards, with guard locking when necessary.	Interlocking guards are provided to comply with these requirements.	Pass
	- they can be adjusted only by an intentional action, such as the use of tool or a key;	This requirement is complied with.	Pass
	-they absence or failure of one of their components prevents starting of the moving parts or stops them; this can be achieved by automatic monitoring (see 4.11.6)	This requirement is complied with.	Pass
6.3.3.2.4	Requirements for adjustable guards		-
	Adjustable guards may only be used where the hazard zone cannot for operational reasons be completely enclosed;		N/A
	They shall:		-
	-be designed so that the adjustment remains fixed during a given operation		N/A
	-be readily adjustable without the use of tools;		N/A
6.3.3.2.5	Requirements for interlocking guards with a start function (control guards)		N/A
	An interlocking guard with a start function may be used provided that		N/A
	- all requirements for interlocking guards are satisfied (see ISO 14119)		N/A
	- the cycle time of the machine is short		N/A
	-the maximum opening time of the guard is present to a low value (e.g. equal to the cycle time). When this time is exceeded, the hazardous function(s) cannot be initiated by the closing of the interlocking guard with a start function and resetting is necessary before restarting the machine.		N/A
	- the dimensions or shape of the machine do not allow a person, or part of a person, to stay in the hazard zone or between the hazard zone and the guard while the guard is closed (see ISO 14120)		N/A
	- all other guards whether fixed (removable type) or movable are interlocking guards;		N/A



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	-the interlocking device associated with the interlocking guard with a start function is designed in such a way – e.g. by duplication of position detectors and use of automatic monitoring (see 4.11.6)- that its failure cannot lead to an unintended/unexpected start-up;		N/A
	-the guard is securely held open(e.g. by a spring or counterweight)such that it cannot initiate a start while falling by its own weight;		N/A
6.3.3.2.6	Hazards from guards		-
	Care shall be taken to prevent hazards which might be generated by:		-
	- the guard construction (e.g. sharp edges or corners, material);	This requirement has been taken into account during design.	N/A
	- the movements of the guards (shearing or crushing zones generated by power-operated guards and by heavy guards which are liable to fall)	This requirement has been taken into account during design.	N/A
6.3.3.3	Technical characteristics of protective devices		N/A
	Protective devices shall be selected or designed and connected to the control system so as to ensure correct implementation of their safety function (s) is ensured.	This requirement has been taken into account during design.	N/A
	Protective devices shall be selected on the basis of their having met the appropriate product standard (for example, IEC 61496 for active optoelectronic protective devices) or shall be designed according to one or several of the principles formulated in ISO 13849-1 or IEC62061.	This requirement has been taken into account during design.	N/A
	Protective devices shall be installed and connected to the control system so that they cannot be easily defeated.	This requirement has been taken into account during design.	N/A
6.3.3.4	Provisions for alternative types of safeguards.	-	N/A
	Provisions should be made to facilitate the fitting of alternative types of safeguards on machinery where it is known that this fitting will be necessary because the work to be done on it will vary.		N/A
6.3.4	Safeguarding for reducing emissions		-
6.3.4.1	General		-



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	If the measures for the reduction of emissions at source mentioned in 6.2.2.2 are not adequate, the machine shall be provided with additional protective measures (see 6.3.4.2 to 6.3.4.5).	No such hazard exists.	Pass
6.3.4.	Noise		-
	Additional protective measures include, for example: -enclosures (see ISO 15667) -screens fitted to the machine; -silencers (see ISO 14163)	No such hazard exists.	Pass
6.3.4.3	Vibration		-
	Additional protective measures include, for example, damping devices for vibration isolation between the source and the exposed person such as resilient mounting or suspended seats.	No such hazard exists.	Pass
	For measures for vibration isolation of stationary industrial machinery see EN 1299	No such hazard exists.	Pass
6.3.4.4	Hazardous substances		N/A
	Additional protective measures include, for example:		N/A
	-encapsulation of the machine (enclosure with negative pressure);		N/A
	- local exhaust ventilation with filtration.		N/A
	- wetting with liquids;		N/A
	- special ventilation in the area of the machine (air curtains , cabins for operators)		N/A
6.3.4.5	Radiation		N/A
	Additional protective measures include, for example:		N/A
	- use of filtering and absorption;		N/A
	- use of attenuating screens or guards		N/A
6.3.5	Complementary protective measures		N/A
6.3.5.1	General		-
	Protective measures which are neither inherently safe design measures, nor safeguarding (implementation of guards and/or protective devices), nor information for use may have to be implemented as required by the intended use and the reasonably foreseeable misuse of the machine. Such measures include, but are not limited to, the ones dealt with in 6.3.5.2 to 6.3.5.6	It meet the requirement.	Pass
6.3.5.2	Components and elements to achieve the emergency stop function		-



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	If following a risk assessment, a machine needs to be fitted with components and elements to achieve an emergency stop function to enable actual or impending emergency situations to be averted, the following requirements apply:		-
	-the actuators shall be clearly identifiable, clearly visible and readily accessible	The actuators can be clearly identifiable, clearly visible and readily accessible	Pass
	-the hazardous process shall be stopped as quickly as possible without creating additional hazards. If this is not possible or the risk cannot be reduced, it should be questioned whether implementation of an emergency stop function is the best solution;	The hazardous process can be stopped as quickly as possible without creating additional hazards	Pass
	-the emergency stop control shall trigger or permit the triggering of certain safeguard movements where necessary.	No this situation exists	Pass
	Once active operation of the emergency stop device has ceased following an emergency stop command, the effect of this command shall be sustained until it is reset.	Reset is necessary before re-start.	Pass
	This reset shall be possible only at that location where the emergency stop command has been initiated. The reset of the device shall not restart the machinery, but only permit restarting.	This requirement is complied with by appropriate design of the emergency stop	Pass
	More details for the design and selection of electrical components and elements to achieve the emergency stop function are provided in EN 60204 series.	Please see the related clauses.	Pass
6.3.5.3	Measures for the escape and rescue of trapped persons-		N/A
	Measures for the escape and rescue of trapped persons may consist e.g. of:		N/A
	-escape routes and shelters in installations generating operator-trapping hazards		N/A
	-arrangements for moving some elements by hand, after an emergency stop		N/A
	-arrangements for reversing the movement of some elements		N/A



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	- anchorage points for descender devices;		N/A
	-means of communication to enable trapped operators to call for help		N/A
6.3.5.4	Measures for isolation and energy dissipation		-
	Especially with regard to their maintenance and repair, machines shall be equipped with the technical means to achieve the isolation from power supply(ies) and dissipation of stored energy as a result of following actions:		-
	a) isolating(disconnecting,separating)the machine(or defined parts of the machine) from all power supplies;	A main switch with lock is provided.	Pass
	b) locking (or otherwise securing) all the isolating units in the isolating position;	Please see the report for EN 60204	Pass
	dissipating or , if this is not possible or practicable, restraining (containing) any stored energy which may give rise to a hazard;	Please see the report for EN 60204	Pass
	verifying, by means of a safe working procedure, that the actions taken according to a), b) and c) above have produced the desired effect.	Please see the report for EN 60204	Pass
	See ISO 14118, clause 5 and EN 60204-1: 5.5 and 5.6		Pass
6.3.5.5	Provisions for easy and safe handling of machines and their heavy component parts		Pass
	Machines and their component parts which cannot be moved or transported by hand shall be provided or capable of being provided with suitable attachment devices for transport by means of lifting gear.	Appropriate attachments are provided.	Pass
	These attachments may be, among others,		Pass
	standardized lifting appliances with slings, hooks, eyebolts, or tapped holes for appliance fixing;		Pass
	appliances for automatic grabbing with a lifting hook when attachment is not possible from the ground.	Such devices are used.	Pass
	guiding grooves for machines to be transported by a fork truck;		Not applicable
	lifting gear and appliances integrated into the machine.		Not applicable



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	Parts of machinery which can be removed manually in operation shall be provided with means for their safe removal and replacement; (See also 6.4.4c item 3).		Pass
6.3.5.6	Measures for safe access to machinery		-
	Machinery shall be so designed as to enable operation and all routine tasks relating to setting and/or maintenance, to be carried out, as far as possible, by a person remaining at ground level.	These requirements have been taken into account during design.	Pass
	Where this is not possible, machines shall have built-in platforms, stairs or other facilities to provide safe access for those tasks, but care should be taken to ensure that such platforms or stairs do not give access to danger zones of machinery.		N/A
	The walking areas shall be made from materials which remain as slip resistant as practicable under working conditions and, depending on the height from the ground, suitable guard-rails (see ISO14122-3) shall be provided.		N/A
	In large automated installations, particular attention shall be given to safe means of access such as walkways, conveyor bridges or crossover points.		N/A
	Means of access to parts of machinery located at a height shall be provided with collective means of protection against falls (e.g. guard-rails for stairways, stepladders and platforms and/or safety cages for ladders)		N/A
	As necessary, anchorage points for personal protective equipment against falls from a height shall also be provided (e.g. in carriers of machinery for lifting persons or with elevating control stations)		N/A
	Openings shall whenever possible open towards a safe position. They shall be designed to prevent hazards due to unintended opening.		N/A
	The necessary aids for access shall be provided (e.g. steps, handholds). Control devices shall be designed and located to prevent their being used as aids for access.		N/A



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	When machinery for lifting goods and/or persons includes landings at fixed levels, these shall be equipped with inter locking guards preventing falls when the platform is not present at the level.		N/A
	Movement of the lifting platform shall be prevented while the guards are open.		N/A
	For detailed provisions see ISO 14122.		N/A
	Information for use		-
6.4	General requirements		-
6.4.1	Drafting information for use is an integral part of the design of a machine(see figure2).	Please see the related clause.	Pass
6.4.1.1	Information of use consists of communication links, such as texts, words, signs, signals, symbols or diagrams, used separately or in combination to convey information to the user. It is directed to professional and/or non-professional users.	All the information is stated in the appropriate place.	Pass
6.4.1.2	Information shall be provided to the user about the intended use of the machine, taking into account, notably, all its operating modes.		-
	The information shall contain all directions required to ensure safe and correct use of the machine. With this in view, it shall inform and warn the user about residual risk.	All the information is stated in the appropriate place.	Pass
	The information shall indicate, as appropriate,		-
	- the need for training,	All the information is stated in the appropriate place.	Pass
	- the need for personal protective equipment,	All the information is stated in the appropriate place.	Pass
	- the possible need for additional guards devices (see Figure 2, Footnote d).	All the information is stated in the appropriate place.	Pass
	It shall not exclude uses of the machine that can reasonably be expected from its designation and description and shall also warn about the risk which would result from using the machine in other ways than the ones described in the information, especially considering its reasonably foreseeable misuse.	All the information is stated in the appropriate place.	Pass



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
6.4.1.3	Information for use shall cover, separately or in combination, transport, assembly and installation, commissioning, use of the machine (setting, teaching/programming or process changeover, operation, cleaning, fault-finding and maintenance) and, if necessary, dismantling, disabling and scrapping.	All the information is stated in the appropriate place.	Pass
6.4.2	Location and nature of the information for use		-
	Depending on the risk , the time when the information is needed by the user and the machine design , it shall be decided whether the information – or parts thereof – are to be given:	All the information is stated in the appropriate place.	Pass
	- in /on the machine itself (see 6.3 and 6.4.4)	Adequate information stated in the machine itself.	Pass
	-in accompanying documents (in particular instruction handbook , see 6.4.5)	Adequate information is stated in the accompanying documents	Pass
	- on the packaging	Adequate information is stated on the packaging	Pass
	- by other means such as signals and warnings outside the machine.	Adequate information is stated	Pass
	Standardized phrases shall be considered where important messages such as warnings need to be given (see also IEC 62079)	This requirement is considered.	Pass
6.4.3	Signals and warning devices		-
	Visual signals (e.g. flashing lights) and audible signals (e.g. sirens) may be used to warn of an impending hazardous event such as machine start-up or overspeed.	Signals and warning devices are provided.	Pass
	Such signals may also be used to warn the operator before the triggering of automatic protective measures (see last paragraph of 5.2.7)	Please see the related clause.	Pass
	It is essential that these signals:		-
	- be emitted before the occurrence of the hazardous event;	This requirement is taken into account during design and selection of the warning devices.	Pass
	- be unambiguous;	This requirement is taken into account during design and selection of the warning devices.	Pass



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	- be clearly perceived and differentiated from all other signals used; - be clearly recognized by the operator and other persons.	This requirement is taken into account during design and selection of the warning devices.	Pass
	The warning devices shall be designed and located such that checking is easy.	This requirement is taken into account during design and selection of the warning devices.	Pass
	The information for use shall prescribe regular checking of warning devices.	This requirement is taken into account during design and selection of the warning devices.	Pass
	The attention of designers is drawn to the risks from "sensorial saturation" which results from too many visual and/or acoustic signals, which may also lead to defeating the warning devices.	This requirement is taken into account during design and selection of the warning devices.	Pass
6.4.4	Markings, signs (pictograms), written warnings		-
	Machinery shall bear all markings which are necessary:		-
	a) for its unambiguous identification, at least - name and address of the manufacturer; - designation of series or type; - serial number, if any.	Adequate information is provided.	Pass
	b) in order to indicate its compliance with mandatory requirements;		-
	- marking; -written indications (e.g. for machines intended for use in potentially explosive atmosphere)	Adequate information is provided.	Pass
	c) for its safe use, e.g. :		-
	- maximum speed of rotating parts; - maximum diameter of tools; -mass (expressed in kilograms) of the machine itself and/or of removable parts - maximum working load; - necessity of wearing personal protective equipment; - guard adjustment data; - frequency of inspection.	Adequate information is provided.	Pass
	Information printed directly on the machine should be permanent and remain legible throughout the expected life of the machine.	This requirement is complied with.	Pass



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	Signs or written warnings only saying "danger" shall not be used.	This requirement is complied with.	Pass
	Readily understandable signs (pictograms) should be used in preference to written warnings.	This requirement is complied with.	Pass
	Signs and pictograms should only be used if they are understood in the culture in which the machinery is to be used.	This requirement is complied with.	Pass
	Markings shall comply with recognized standards (see ISO 2972, ISO 7000, particularly for pictograms, symbols, colours) See EN 60204 series as regards marking of electrical equipment.	This requirement is complied with.	Pass
6.4.5	Accompanying documents (in particular, instruction handbook)		-
6.4.5.1	Contents		-
	The instruction handbook or other written instructions (e.g. on the packaging) shall contain among others:		-
	a) information relating to transport, handling and storage of the machine e.g. :	All the related information is stated in the instruction handbook	Pass
	- storage conditions for the machine;	All the related information is stated in the instruction handbook	Pass
	-dimensions , mass value(s), position of the centre (s) of gravity;	All the related information is stated in the instruction handbook	Pass
	-indications for handling (e.g. drawings indicating application points for lifting equipment)	All the related information is stated in the instruction handbook	Pass
	b) information relating to installation and commissioning of the machine, e.g.		-
	- fixing/anchoring and vibration dampening requirements	All the related information is stated in the instruction handbook	Pass
	- assembly and mounting conditions;	All the related information is stated in the instruction handbook	Pass
	- space needed for use and maintenance;	All the related information is stated in the instruction handbook	Pass
	- permissible environmental conditions (e.g. temperature, moisture, vibration, electromagnetic radiation);	All the related information is stated in the instruction handbook	Pass



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	-instructions for connecting the machine to power supply (particularly about protection against electrical overloading);	All the related information is stated in the instruction handbook	Pass
	- advice about waste removal /disposal;	All the related information is stated in the instruction handbook	Pass
	-if necessary, recommendations about protective measures which have to be taken by the user, e.g. additional safeguards, safety distances, safety signs and signals.	All the related information is stated in the instruction handbook	Pass
	c) information relating to the machine itself, e.g. :		-
	-detailed description of the machine, its fittings, its guards and/or protective devices;	All the related information is stated in the instruction handbook	Pass
	-comprehensive range of applications for which the machine is intended, including prohibited usages, if any , taking into account variations of the original machine if appropriate.	All the related information is stated in the instruction handbook	Pass
	-diagrams (especially schematic representation of safety functions);	All the related information is stated in the instruction handbook	Pass
	- data about noise and vibration generated by the machine, about radiation, gases, vapours, dust emitted by it, with reference to the measuring methods used.	All the related information is stated in the instruction handbook	Pass
	-technical documentation about electrical equipment (see EN 60204 series)	All the related information is stated in the instruction handbook	Pass
	-documents attesting that the machine complies with mandatory requirements;	All the related information is stated in the instruction handbook	Pass
	d)information relating to the use of the machine, e.g. about:	All the related information is stated in the instruction handbook	Pass



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	<ul style="list-style-type: none">- intended use;- description of manual controls (actuators);- setting and adjustment;- modes and means for stopping (especially emergency stop)- risks which could not be eliminated by the protective measures taken by the designer;- particular risks which may be generated by certain applications, by the use of certain fittings, and about specific safeguards which are necessary for such applications.-reasonably foreseeable misuse and prohibited usages;- fault identification and location , repair, and re-starting after an intervention;- personal protective equipment which need to be used and training required.	All the related information is stated in the instruction handbook	Pass
	e) information for maintenance e.g.	All the related information is stated in the instruction handbook	Pass
	<ul style="list-style-type: none">-nature and frequency of inspections for safety functions;-instructions relating to maintenance operations which require a definite technical knowledge or particular skills and hence should be carried out exclusively by skilled persons (e.g. maintenance staff, specialists)- instructions relating to maintenance actions (e.g. replacement of parts) which do not require specific skills and hence may be carried out by users (e.g. operators)-drawings and diagrams enabling maintenance personnel to carry out their task rationally (especially fault-finding tasks)f) information relating to de-commissioning , dismantling and disposal;g) information for emergency situations , e.g. :<ul style="list-style-type: none">- type of fire-fighting equipment to be used.- warning about possible emission or leakage of harmful substance(s), and if possible, indication of means to fight their effects.	All the related information is stated in the instruction handbook	Pass
	h) maintenance instructions provided for skilled persons (second dash in e))and maintenance instructions provided for unskilled persons (third dash in e)), that should appear clearly separated from each other.	All the related information is stated in the instruction handbook	Pass



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
6.4.5.2	Production of the instruction handbook	All the related information is stated in the instruction handbook	Pass
	a) type and size of print shall ensure the best possible legibility. Safety warnings and/or cautions should be emphasized the use of colours, symbols and/or large print.	All the related information is stated in the instruction handbook	Pass
	b) information for use shall be given in the language(s) of the country in which the machine will be used for the first time and in the original version. If more than one language are to be used, each language should be readily distinguished from the other(s), and efforts should be made to keep the translated text and the relevant illustration together.	All the related information is stated in the instruction handbook	Pass
	c) whenever helpful to the understanding, text should be supplemented with written details enabling, for instance, manual controls (actuators) to be located and identified; they should not be separated from the accompanying text and should follow sequential operations.	All the related information is stated in the instruction handbook	Pass
	d) consideration should be given to presenting information in tabular form where this will aid understanding. Tables should be adjacent to the relevant text.	All the related information is stated in the instruction handbook	Pass
	e) the use of colours should be considered, particularly in relation to components requiring quick identification.	All the related information is stated in the instruction handbook	Pass
	f) when information for use is lengthy, a table of contents and/or an index should be given.	All the related information is stated in the instruction handbook	Pass
	g) safety-relevant instructions which involve immediate action should be provided in a form readily available to the operator.	All the related information is stated in the instruction handbook	Pass
6.4.5.3	Drafting and editing information for use		-
	a) relationship to model : the information shall clearly relate to the specific model of machine and, if necessary, other appropriate identification (for example, by serial number).	All the related information is stated in the instruction handbook	Pass
	b) communicate principles : when information for use is being prepared, the communication process "see-think-use" should be followed in order to achieve the maximum effect and should follow sequential operations. The questions "how ?" and "why ?" should be anticipated and the answers provided.	All the related information is stated in the instruction handbook	Pass



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	c) information for use shall be as simple and as brief as possible, and should be expressed in consistent terms and units with a clear explanation of unusual technical terms.	All the related information is stated in the instruction handbook	Pass
	d) when it is foreseen that a machine will be put to non-professional use, the instructions should be written in a form that is readily understood by the non-professional users. If personal protective equipment is required for the safe use of the machine, clear advice should be given, e.g. on the packaging as well as on the machine, so that this information is prominently displayed at the point of sale.	All the related information is stated in the instruction handbook	Pass
	e) durability and availability of the documents : documents giving instructions for use should be produced in durable form (i.e. they should be able to survive frequent handling by the user). It may be useful to mark them "keep for future reference". Where information for use is kept in electronic form (e.g. CD, DVD, tape) information on safety-related issues that need immediate action shall always be backed up with a hand copy that is readily available.	All the related information is stated in the instruction handbook	Pass
7	Documentation of risk assessment and risk reduction		-
	The documentation shall demonstrate the procedure that has been followed and the results that have been achieved. This includes, when relevant, documentation		N/A
	a)the machinery for which the risk assessment has been made (for example, specifications, limits, intended use);	See the risk assessment report in detail.	Pass
	b) any relevant assumptions that have been made (loads, strengths, safety factors, etc.);	See the risk assessment report in detail.	Pass
	c) the hazards and hazardous situations identified and the hazardous events considered in the risk assessment	See the risk assessment report in detail.	Pass
	d) the information on which risk assessment was based (see 5.2):	See the risk assessment report in detail.	Pass
	1) the data used and the sources (accident histories, experience gained from risk reduction applied to similar machinery, etc.);	See the risk assessment report in detail.	Pass



EN ISO 12100			
Clause	Requirement – Test	Result - Remark	Verdict
	2) the uncertainty associated with the data used and its impact on the risk assessment;	See the risk assessment report in detail.	Pass
	e) the risk reduction objectives to be achieved by protective measures;	See the risk assessment report in detail.	Pass
	f) the protective measures implemented to eliminate identified hazards or to reduce risk;	See the risk assessment report in detail.	Pass
	g) residual risks associated with the machinery;	See the risk assessment report in detail.	Pass
	h) the result of the risk assessment (see Figure 1);	See the risk assessment report in detail.	Pass
	i) any forms completed during the risk assessment.	See the risk assessment report in detail.	Pass



EN 60204-1			
Clause	Requirement – Test	Result - Remark	Verdict
1	Scope		--
	This standard applies to the application electrical and electronic equipment and systems to machines.	The product is within the scope of IEC 60204-1 for industrial use.	Pass
4	General requirements		--
4.1	General		Pass
4.2	Selection of equipment		Pass
4.3	The electrical equipment shall operate correctly under full load.	According to marking on the equipment and function test, the electrical equipment would operate correctly.	Pass
4.3.1	a.c. supplies		Pass
	Voltage variations: 0,9 - 1,1	AC380V	Pass
	Frequency variation: 0,99 - 1,01 0,98 - 1,02	50Hz	Pass
	Harmonics distortion: 10% 2nd to 5th harmonics 12% 6th to 30th harmonics		Pass
	Voltage unbalance in 3-phase supplies		Pass
	Voltage impulses (1,5ms)		N/A
	Voltage interruption (3ms)		Pass
	Voltage dips (20%)		Pass
4.3.2	d.c. supplies		N/A
	From batteries:		N/A
	Voltage variations: 0,85 - 1,15 0,7 - 1,2		N/A
	Voltage interruption (5ms)		N/A
	From converting equipment		N/A
	Voltages variations: 0,85 - 1,15 0,7 - 1,2		N/A
	Voltage interruption (5ms)		N/A
	Ripple (0,05% of nom. voltage)		N/A
4.4	Physical environment and operating condition	Reference to instruction	--
4.4.1	Electromagnetic compatibility (EMC)		Pass



EN 60204-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Withstand test specified in EN61004-6-4 , EN61000-6-2	Complies	Pass
4.4.2.	Temperature, between 5°C to 40 °C Average temp. not more than +35°C	According to the instruction manual, this machine is designed within this range.	Pass
	Temperature, between 5°C to 40 °C	Ditto	Pass
4.4.3.	Humidity:	Ditto	Pass
4.4.4.	Altitude: max 1000m	Ditto	Pass
4.4.5.	Contaminants: Adequate protection against the ingress of solid bodies and liquids.	The clause has been met. metal enclosure used and comply with IP20 requirement according to IEC 60529	Pass
4.4.6.	Ionizing and non-ionizing radiation: When the equipment is subject to radiation	Not applicable	N/A
4.4.7.	Vibration, shock and bump.	No particular requirements for vibration, shock & bump are found required, unless otherwise special agreement.	Pass
4.5	Transportation and storage. -25 to +55 °C and short periods up to +70 °C	According to safe instruction of instruction manual, this machine is designed within this range.	Pass
4.6	Provisions for handling. Suitable means for handling by cranes or similar equipment.	Not applicable	N/A
4.7	Installation and operation Suppliers instruction	All the electrical equipment have been installed, and operated in accordance with the supplier's manual.	Pass
5.0	Incoming supply conductors termination and devices for disconnecting and switching of.		--
5.1	Incoming supply conductor termination		--
	Single or multiple power supply		Pass
	Separate terminals		N/A
	Plug provided with the machine		N/A
	Neutral conductor labelled and marked in installation instruction.		N/A



EN 60204-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Connection between protective earth and neutral.		Pass
	Identification of incoming supply connection.		Pass
5.2	External protective conductor terminal		Pass
	The placing of the terminal		N/A
	Size of the terminal		Pass
	Marking of the external protective conductor with letters "PE"		Pass
	Other protective terminals shall be marked with the symbol 417-IEC-5019 or by use of bicolour combination Green-And-Yellow	Green-And-Yellow	Pass
5.3	Supply disconnecting (isolating) device		--
5.3.1	Hand operated disconnect device for each incoming device.		Pass
	Interlocks		N/A
5.3.2	a) Switch-disconnecting device b) A disconnect with auxiliary device c) Circuit breaker d) Plug / socket combination.		Pass
5.3.3	Requirements		--
5.3.3.1	General		Pass
	Marked with "I" and "O"		N/A
	When "Off" then all conductors are open		Pass
	Have an external operating handle. Not emergency stop device and not RED.		Pass
	Means to be locked in "OFF" position		Pass
	Disconnect all live conductors		N/A
	Breaking capacity		N/A
5.3.3.2	Power operated circuit-breakers		N/A
	Means for manual operation		N/A
	Manual as well as remote closing		N/A
5.3.4	Disconnect device shall be easily accessible. 0,6 and 1,9 m		Pass



EN 60204-1			
Clause	Requirement – Test	Result - Remark	Verdict
5.3.5	Excepted circuits - lightning - plug/ Socked circuits - Undervoltage protection - Circuits supplying equipment - Control circuits	No excepted circuit	N/A
	Warning label for excepted circuits - Warning label at disconnect device - Warning label at each circuit - Statement in maintenance manual		Pass
5.4	Not applicable		N/A
5.5	Devices for disconnecting electrical equipment		N/A
5.6	Protection against unauthorized, inadvertent and/or mistaken connection		Pass
6	Protection against electric shock		--
6.1	General: Protections against: - direct contact; and - indirect contact		Pass
6.2	Protection against direct contact. 6.2.1. and 6.2.2. are applicable and 6.2.3. shall be applied		Pass
6.2.1	Protection by enclosures.		N/A
	Minimum protection : IP4X or IPXXB		N/A
a)	Use of key or tool for access for skilled persons.		N/A
	Minimum requirement inside doors: IP1X or IPXXA		N/A
	Minimum requirement inside doors for live parts which are likely to be touched: IP2X or IPXXB		Pass
	Rooms used as enclosures which are accessible only to skilled persons, then IEC 364-4-41, IEC 364-4-47 and EN 60439-1 apply.		Pass
b)	Interlocking of doors		Pass
	Device or tools to defeat the interlock		Pass



EN 60204-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Disconnect device shall be protected against direct contact to at least IP2X or IPXXB		Pass
	Warning sign according to 18.2		N/A
c)	without use of key or tool		N/A
	Protected against direct contact to at least IP2X or IPXXB		N/A
	Where barriers are used then tool or disconnect device are required.		N/A
6.2.2	Protection by insulation of live parts		Pass
	Live part shall be covered by insulation which withstand mechanical, chemical, electrical and thermal stresses during normal service conditions.		Pass
	Protection against residual voltages		N/A
	After disconnection the voltage shall drop to 60V or less within 5 second.		N/A
	Exemption: - Components with stored charge of 60 μ C or less or - If the rate of discharge does interfere with the proper function of the equipment.		N/A
	Warning notice located on or adjacent to the enclosure.		N/A
	Plugs: Discharge time shall not exceed 1 second.		N/A
	Exemption: The conductors are protected against direct contact to at least IP2X or IPXXB.		N/A
6.3	Protection against indirect contact		Pass
	Hazardous condition when insulation fails between live parts and exposed conductive parts.		Pass
	Each circuit or part one of 6.3.1, 6.3.2 or 6.3.3 shall be applied.		N/A
6.3.1	Protection by automatic disconnection of supply.		Pass
	Protective bonding circ		N/A



EN 60204-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Protective device for automatic disconnection of the supply in case of insulation failure.		N/A
	Co-ordination between type of power supply and disconnect device accordance with 413.1 of IEC 364-4-41		N/A
6.3.2	Protection by use of Class II equipment or by equivalent insulation		N/A
	- Use of class II electrical device or reinforced or by equivalent insulation.		N/A
	- Use of switchgear and controlgear assemblies		N/A
	- application of supplementary or reinforced insulation according to IEC 364-4-41		N/A
6.3.3	Protection by electrical separation		Pass
	Electrical separation by an individual circuit to prevent shock current through contact with exposed conductive parts. IEC 364-4-41 shall apply.		Pass
6.4	Protection by use of PELV (Protective Extra Low Voltage).	No PELV circuit	N/A



EN 60204-1			
Clause	Requirement – Test	Result - Remark	Verdict
	PELV shall satisfy all of the following conditions: a) Max 25 Vac or 60Vdc b) Max current when failure to 1A a.c. or 0,2A d.c. c) Max 80 mm ² of area not protected. d) Only indoor with dry condition. e) Source of supply shall be insulated according to with higher voltage according to 6.3.3 and 15.1.3 f) PELV circuit shall be bonded to protective earth. g) Exposed conductive parts associated with PELV shall be insulated or bonded. h) Plugs and socket outlets: 1) Plugs shall not be able to enter other sockets than in PELV circuits 2) Socket outlets shall exclude plugs from other circuits than PELV i) Where this circuits are used as control circuits then they shall also fulfil the relevant requirements of clause 9.		N/A
7	Protection of equipment		--
7.1	General		Pass
7.2	Overcurrent protection		Pass
7.2.1	Supply conductors		Pass
	The supplier is not responsible for the overcurrent device for the supply conductors.		Pass
	Installation diagram with data necessary for selection of overcurrent protective device.		N/A
7.2.2	Power circuits		N/A
	All live conductors except earthed neutral conductor shall be protected against overcurrent.		N/A
	Cross section area for Neutral conductor is at least equal to or equivalent to that of the phase conductors. It is not necessary		N/A



EN 60204-1			
Clause	Requirement – Test	Result - Remark	Verdict
	For Neutral conductors smaller than phase conductors then IEC 60364-4-473 shall apply	The clause has been met.	Pass
	For IT power system it is generally necessary to provide an overcurrent protection.	No IT power system	N/A
7.2.3	Control circuits		Pass
	Conductors for control circuits connected to supply voltage shall be protected against overcurrent according to 7.2.2	Conductors for control circuit have overcurrent protective device in approved switch power supply.	Pass
	Control circuits feed through a transformer		N/A
7.2.4	Socket outlets and their associated conductors		Pass
	Overcurrent protection is required for socket outlets		Pass
	Provided in phase conductors	Not applicable	N/A
7.2.5	Local lightning circuits	Without local lighting circuit	N/A
	Separate protected by overcurrent device	Not applicable	N/A
7.2.6	Transformers		N/A
	Transformers shall be protected against overcurrent in accordance with IEC 76-5 and EN 60742	Not applicable	N/A
7.2.7	Location of overcurrent protective device		N/A
	Overcurrent protective device shall be located where the conductors are connected to the power supply.		N/A
7.2.8	Overcurrent protective device		N/A
	The breaking capacity		N/A
7.2.9	Rating and setting of overcurrent device		N/A
7.3	Overload protection of motors		Pass
7.4	Abnormal temperature protection		Pass
7.5	Protection against supply interruption or voltage reduction and subsequent restoration		Pass
7.6	Motor overspeed protection		N/A
7.7	Earth fault/residual current protection	Not applicable	N/A
7.8	Phase sequence port	Not applicable	N/A



EN 60204-1			
Clause	Requirement – Test	Result - Remark	Verdict
7.9	Protection against overvoltages due to lightning and to switching surges	Not applicable	N/A
8	Equipotent bonding		--
8.1	General		Pass
8.2	Protective bonding circuit		Pass
8.2.1	General		Pass
8.2.2	Protective conductors		N/A
8.2.3	Continuity of the protective bonding circuit		N/A
8.2.4	Exclusion of switching devices from the protective bonding circuit	No this device	N/A
8.2.5	Parts which need not to be connected to the protective bonding circuit		Pass
8.2.6	Interruption of the protective bonding circuits		N/A
	Protective conductor connecting points		N/A
8.2.7	Mobile machines	No this situation	N/A
8.2.8	Additional protective bonding requirements for electrical equipment having earth leakage currents higher than 10mA a.c. or d.c.		N/A
8.3	Bonding to the protective circuit for operational purposes	No this situation	N/A
8.4	insulation failures Measures to limit the effects of high leakage current		N/A
8.5	Bonding to a common reference potential	No this situation	N/A
8.6	Electrical interference	No this situation	N/A
9	Control circuits and control functions		--
9.1	Control circuits		--
9.1.1	Control circuit supply		Pass
9.1.2	Control circuit voltages		Pass
9.1.3	Protections		Pass
9.1.4	Connection to control devices		Pass
9.2	Control function		Pass
9.2.1	Start functions		Pass
9.2.2	Stop functions		Pass
9.2.3	Operating modes		N/A
9.2.4	Suspensions of safeguards		N/A
9.2.5	Operation		Pass



EN 60204-1			
Clause	Requirement – Test	Result - Remark	Verdict
9.2.5.1	General		Pass
9.2.5.2	Start		Pass
	Interlocks		N/A
	Machines which require more than one control station to indicate a start.	Not applicable	N/A
9.2.5.3	Stop		Pass
	Interlocks		N/A
	The reset of the stop function		N/A
	Machines which require more than one control station to indicate a start.	Not applicable, only one starts.	N/A
9.2.5.4	Emergency stop		N/A
9.2.5.5	Monitoring of command actions		N/A
9.2.6	Other control functions		N/A
9.2.6.1	Hold-to-run controls	No this device	N/A
9.2.6.2	Two-hand control	No this device	N/A
9.2.6.3	Enabling control		N/A
9.2.6.4	Combined start and stop controls		N/A
9.2.7	Cableless control	Not applicable	N/A
9.3	Protective interlocks		N/A
9.3.1	Restoration of interlocked safeguards	Not applicable	N/A
9.3.2	Overtravel limits		N/A
9.3.3	Operation of auxiliary functions	Not applicable	N/A
9.3.4	Interlocks between different operations and for contrary motions		N/A
9.3.5	Reverse current breaking	No this device	N/A
9.4	Control functions in case of failure		N/A
9.4.1	General requirements		N/A
9.4.2	Measures to minimize risk in case of failure		N/A
9.4.2.1	Use of proven circuit techniques and components		N/A
9.4.2.2	Provision of redundancy		N/A
9.4.2.3	Use of diversity		N/A
9.4.2.4	Functional test		N/A
9.4.3	Protection against maloperations due to earth faults and voltage interruption		N/A
9.4.3.1	Earth faults		N/A
9.4.3.2	Voltage interruptions		N/A



EN 60204-1			
Clause	Requirement – Test	Result - Remark	Verdict
9.4.3.3	Loss of circuit continuity		N/A
10	Operator interface and machine mounted control devices		--
10.1	General	Comply with requirement	N/A
10.1.1	Location and mounting		N/A
10.1.2	Protection		N/A
10.1.3	Position sensors	Not applicable	N/A
10.2	Push-buttons		Pass
10.2.1	Colours		Pass
10.2.2	Markings	Markings are compliance with IEC-417	Pass
10.3	Indicator lights and displays		Pass
10.3.1	Modes of use		Pass
10.3.2	Colours		Pass
10.3.3	Flashing lights	No this device	N/A
10.4	Illuminated push-buttons		Pass
10.5	Rotary control devices	Not applicable	N/A
10.6	Start devices	They are constructed to minimize inadvertent operation.	N/A
10.7	Emergency stop devices		--
10.7.1	Location of emergency stop devices E		N/A
10.7.2	Types		N/A
10.7.3	Colour of actuators		Pass
10.7.4	Local operation of the supply disconnecting device to effect emergency stop	Not applicable	N/A
10.7.5	Use of means of disconnection	No this situation	N/A
10.8	Emergency switching off device		N/A
10.8.1	Location	Operation location	N/A
10.8.2	Types		N/A
10.8.3	Colour of actuators		N/A
10.8.4	Local operation of the supply disconnecting device to effect emergency switching off		N/A
10.9	Enabling control device	No this situation	N/A
11	Electronic equipment		--
11.1	General		Pass



EN 60204-1			
Clause	Requirement – Test	Result - Remark	Verdict
11.2	Basic requirements	Indications of state about input and output are supplied.	Pass
11.2.2	Electronic control equipment		Pass
11.2.3	Equipotent bonding		N/A
11.3	Programmable equipment	Not applicable	N/A
11.3.1	Programmable controllers	Not applicable	N/A
11.3.2	Memory retention and protection	The clause has been met.	Pass
11.3.3	Programming equipment	Not applicable	N/A
11.3.4	Software verification	Software verification has been carried out.	N/A
11.3.5	Use in safety-related functions	It has been tested.	Pass
11	Controlgear: location, mounting and enclosures		--
11.1	General requirements		Pass
11.2	Location and mounting		Pass
11.2.1	Accessibility and maintenance	Not applicable	N/A
11.2.2	Segregation		Pass
11.2.3	Heating effects		Pass
11.3	Degrees of protection		Pass
11.4	Enclosures, doors and openings		Pass
11.5	Access to controlgear Minimum dimension of gangways	No this situation	N/A
12	Conductors and cables		--
12.1	General requirements		N/A
12.1	General requirements		N/A
12.2	Conductors		N/A
12.3	Insulation		N/A
12.4	Current carrying capacity in normal service		N/A
12.5	Voltage drop		N/A
12.6	Minimum cross-section area		N/A
12.6	Flexible cables		N/A
12.6.1	General		N/A
12.6.2	Mechanical rating		N/A
12.6.3	Current-carrying capacity of cables wound on drums		N/A



EN 60204-1			
Clause	Requirement – Test	Result - Remark	Verdict
12.7	Collector wires, collector bars and slip-ring assemblies		N/A
12.7.1	Protection of against direct contact		N/A
17.2	Protective conductor circuit	Not applicable	N/A
12.7.3	Protective conductor current collectors	Not applicable	N/A
12.7.4	Removable current collectors with a disconnecter function	Not applicable	N/A
12.7.5	Clearances in air (IEC60664-1)		Pass
12.7.6	Creepage distance (IEC60664-1)		Pass
12.7.7	Conductor system section	Not applicable	N/A
12.7.8	Construction and installation		Pass
13	Wiring practices		--
13.1	Connection and routing		N/A
13.1.1	General requirements		N/A
13.1.2	Conductor and cable runs		N/A
13.1.3	Conductors of different circuits		N/A
13.2	Identification of conductors		N/A
13.2.1	General requirements		N/A
13.2.2	Identification of the protective conductor		N/A
13.2.3	Identification of Neutral conductor		N/A
13.2.4	Identification by colour		N/A
13.3	Wiring inside enclosures		N/A
13.4	Wiring outside enclosures		N/A
13.4.1	General requirements		N/A
13.24.2	External ducts		N/A
13.4.3	Connection to moving elements of the machine		N/A
13.4.4	Interconnection of devices on the machine		N/A
13.4.5	Plug and socket connection		N/A
13.4.6	Dismantling for shipment		N/A
13.4.7	Additional conductors		N/A
13.5	Ducts, connection and junction boxes		N/A
13.5.1	General requirements		N/A
13.5.2	Percentage fill of ducts		N/A
13.5.3	Rigid metal conduit and fittings		N/A
13.5.4	Flexible metal conduit and fittings		N/A



EN 60204-1			
Clause	Requirement – Test	Result - Remark	Verdict
13.5.5	Flexible non-metal conduit and fittings		N/A
13.5.6	Cable trunking systems		N/A
13.5.7	Machines compartments and cable trunking systems		N/A
13.5.8	Connection boxes and other boxes		N/A
13.5.9	Motor connection boxes		N/A
14	Electric motors and associated equipment		--
14.1	General requirements (IEC60034)		Pass
14.2	Motor enclosures		Pass
14.3	Motor dimensions (IEC60072)		Pass
14.4	Motor mounting and compartments		Pass
14.5	Criteria for motor selections		N/A
14.6	Protective devices for mechanical brakes		N/A
15	Accessories and lightning		
15.1	Accessories	No accessories	N/A
15.2	Local lightning of the machines and equipment		N/A
15.2.1	General		N/A
15.2.2	Supply		N/A
15.2.3	Protection		N/A
15.2.4	Fittings		N/A
16	Marking, warning signs and reference designation		--
16.1	General--Name plates, marking and identification plates	Name plates, marking and identification plates have been provided.	Pass
16.2	Warning signs		Pass
16.2.1	Electric shock hazard	Machine is marked with warning signs.	Pass
16.2.2	Hot surfaces hazard	Machine is marked with warning signs.	Pass
16.3	Functional identification	According to symbol of panel and instruction manual, it is met.	Pass



EN 60204-1			
Clause	Requirement – Test	Result - Remark	Verdict
16.4	Marking of control equipment	Marking of equipment is checked by inspection.	Pass
16.5	Reference designations	The clause has been met.	Pass
17	Technical documentation		--
17.1	General	English approved	Pass
17.2	Information to be provided	The clause has been met.	Pass
17.3	Requirements applicable to all documentation	These documents are: Installation diagram, Circuit diagram, Parts list of electrical components, Marking, Instruction manual	Pass
17.4	Installation diagram Documents	Installation diagram is checked by inspection.	Pass
17.5	System (bloc) diagram Overview diagrams and function diagrams	The clause has been met.	Pass
17.6	Circuit diagrams	Circuit diagram is checked by inspection.	Pass
17.7	Operating manual	Operating of instruction manual is checked by inspection.	Pass
17.8	Maintenance manual	Maintenance of instruction manual is checked by inspection.	Pass
17.9	Part list	Parts list of electrical components is checked by inspection.	Pass
18	Verification		--
18.1	General	See the following test reports of annex A	Pass
18.2	Continuity of the protective bonding circuit	circuit Refer to the Test report	Pass
18.3	Insulation resistance test	>100M Ω	Pass
18.4	Voltage	AC380V	Pass
18.5	Protection against residual voltages	Refer to the Test report	Pass
18.6	Functional	Functional tests have carried out.	Pass
18.7	Retesting	Refer to instruction manual, being the fulfilment with this statement.	Pass



EN 60204-1			
Clause	Requirement – Test	Result - Remark	Verdict

1. Continuity of the protective bonding circuit

Test Points	Test Result(M Ω)	Test Current(A)	Voltage Drop(V)
Motor	119	10	1.65
Enclosure	95	10	1.08

2. Insulation Resistance

Test Points	Test Result(M Ω)
Motor	1189M Ω
Enclosure	1043M Ω

3. Withstanding Voltage

Test Points	Breakdown
L- N	No Breakdown
L-PE	No Breakdown
N-L-PE	No Breakdown
L, N - PE	No Breakdown
L, N - Switch	No Breakdown
L, N - Enclosure	No Breakdown



EN 60204-1			
Clause	Requirement – Test	Result - Remark	Verdict
5	Risk assessment		-
5.1	General		-
	Risk assessment comprises (see Figure 1)		P
	-risk analysis, comprising		P
	1) determination of the limits of the machinery (see 5.3),		P
	2) hazard identification (5.4 and Annex B), and		P
	3) risk estimation (see 5.5), and		P
	-risk evaluation (see 5.6).		P
	Risk analysis provides information required for the risk evaluation, which in turn allows judgments to be made about whether or not risk reduction is required.		P
	These judgments shall be supported by a qualitative or, where appropriate, quantitative estimate of the risk associated with the hazards present on the machinery.		P
	The risk assessment shall be documented according to Clause 7.		P
5.2	Information for risk assessment		-
	The information for risk assessment should include the following.	See manual	P
	a) Related to machinery description:		P
	1) user specifications;		P
	2) anticipated machinery specifications, including		P
	i) a description of the various phases of the whole life cycle of the machinery,		P
	ii) design drawings or other means of establishing the nature of the machinery, and		P
	iii) required energy sources and how they are supplied;		P
	3) documentation on previous designs of similar machinery, if relevant;		P
	4) information for use of the machinery, as available.	See manual	P
	b) Related to regulations, standards and other applicable documents:		P
	1) applicable regulations;		P
	2) relevant standards;		P
	3) relevant technical specifications;		P
	4) relevant safety data sheets.		P
	c) Related to experience of use:		P
	1) any accident, incident or malfunction history of the actual or similar machinery;		P
	2) the history of damage to health resulting, for example, from emissions (noise, vibration, dust, fumes, etc.), chemicals used or materials processed by the machinery;		P
	3) the experience of users of similar machines and, whenever practicable, an exchange of information with the potential users.		P
	d) Relevant ergonomic principles.		P
	The information shall be updated as the design develops or		P



EN 60204-1			
Clause	Requirement – Test	Result - Remark	Verdict
	when modifications to the machine are required.		
	Comparisons between similar hazardous situations associated with different types of machinery are often possible, provided that sufficient information about hazards and accident circumstances in those situations is available.		P
	For quantitative analysis, data from databases, handbooks, laboratories or manufacturers' specifications may be used, provided that there is confidence in the suitability of the data. Uncertainty associated with these data shall be indicated in the documentation (see Clause 7).		P
5.3	Determination of limits of machinery		-
5.3.1	General		-
	Risk assessment begins with the determination of the limits of the machinery, taking into account all the phases of the machinery life. This means that the characteristics and performances of the machine or a series of machines in an integrated process, and the related people, environment and products, should be identified in terms of the limits of machinery as given in 5.3.2 to 5.3.5.		P
5.3.2	Use limits		-
	Use limits include the intended use and the reasonably foreseeable misuse. Aspects to be taken into account include the following:		P
	a) the different machine operating modes and different intervention procedures for the users, including interventions required by malfunctions of the machine;		P
	b) the use of the machinery (for example, industrial, non-industrial and domestic) by persons identified by sex, age, dominant hand usage, or limiting physical abilities (visual or hearing impairment, size, strength, etc.);		P
	c) the anticipated levels of training, experience or ability of users including:		P
	1) operators,		P
	2) maintenance personnel or technicians,		P
	3) trainees and apprentices, and		P
	4) the general public;		P
	d) exposure of other persons to the hazards associated with the machinery where it can be reasonably foreseen:		P
	1) persons likely to have a good awareness of the specific hazards, such as operators of adjacent machinery;		P
	2) persons with little awareness of the specific hazards but likely to have a good awareness of site safety procedures, authorized routes, etc., such as administration staff;		P
	3) persons likely to have very little awareness of the machine hazards or the site safety procedures, such as visitors or members of the general public, including children.		P
	If specific information is not available in relation to b), above, the manufacturer should take into account general		P



EN 60204-1			
Clause	Requirement – Test	Result - Remark	Verdict
	information on the intended user population (for example, appropriate anthropometric data).		
5.3.3	Space limits		-
	Aspects of space limits to be taken into account Include:		P
	a) the range of movement,		P
	b) space requirements for persons interacting with the machine, such as during operation and maintenance,		P
	c) human interaction such as the operator-machine interface, and		P
	d) the machine-power supply interface.		P
5.3.4	Time limits		-
	Aspects of time limits to be taken into account include:		P
	a) the life limit of the machinery and/or of some of its components (tooling, parts that can wear, electromechanical components, etc.), taking into account its intended use and reasonably foreseeable misuse, and		P
	b) recommended service intervals.		P
5.3.5	Other limits	Shall be applied in instructions.	-
5.4	Hazard identification		-
	-transport, assembly and installation;		P
	-commissioning;		P
	-use;		P
	-dismantling, disabling and scrapping.		P
	The designer shall identify hazards taking into account the following.		P
	a) Human interaction during the whole life cycle of the machine		P
	b) Possible states of the machine		P
	c) Unintended behaviour of the operator or reasonably foreseeable misuse of the machine		P
5.5	Risk estimation		-
5.5.1	General		-
5.5.2	Elements of risk		-
5.5.2.1	General		-
	The risk associated with a particular hazardous situation depends on the following elements:		P
	a) the severity of harm;		P
	b) the probability of occurrence of that harm, which is a function of		P
	1) the exposure of person(s) to the hazard,		P
	2) the occurrence of a hazardous event, and		P
	3) the technical and human possibilities to avoid or limit the harm.		P
5.5.2.2	Severity of harm		-
	The severity can be estimated by taking into account		P



EN 60204-1			
Clause	Requirement – Test	Result - Remark	Verdict
	the following:		
	a) the severity of injuries or damage to health, for example,	If you do not comply with operational rules, it will cause serious harm, even death.	P
	-slight,		P
	-serious		P
	-death.		P
	b) the extent of harm, for example, to		P
	-one person,		N
	-several persons.		P
5.5.2.3	Probability of occurrence of harm		-
5.5.2.3.1	Exposure of persons to the hazard		-
	The exposure of a person to the hazard influences the probability of the occurrence of harm. Factors to be taken into account when estimating the exposure are, among others,		P
	a) the need for access to the hazard zone (for normal operation, correction of malfunction, maintenance or repair, etc.),		P
	b) the nature of access (for example, manual feeding of materials),		P
	c) the time spent in the hazard zone,		P
	d) the number of persons requiring access, and		P
	e) the frequency of access.		P
5.5.2.3.2	Occurrence of a hazardous event		-
	The occurrence of a hazardous event influences the probability of occurrence of harm. Factors to be taken into account when estimating the occurrence of a hazardous event are, among others,		P
	a) reliability and other statistical data,		P
	b) accident history,		P
	c) history of damage to health, and		P
	d) comparison of risks (see 5.6.3).		P
5.5.2.3.3	Possibility of avoiding or limiting harm		-
	The possibility of avoiding or limiting harm influences the probability of occurrence of harm. Factors to be taken into account when estimating the possibility of avoiding or limiting harm are, among others, the following:		P
	a) different persons who can be exposed to the hazard(s), for example,		P
	-skilled,	Only for skilled person	P
	-unskilled;		N
	b) how quickly the hazardous situation could lead to harm, for example,		P
	-suddenly,	The harm may be suddenly	P
	-quickly,	The harm may be	P



EN 60204-1			
Clause	Requirement – Test	Result - Remark	Verdict
		quickly	
	-slowly;		N
	c) any awareness of risk, for example,		P
	-by general information, in particular, information for use,	Information for use is applied on the machinery and manual.	P
	-by direct observation,	Direct observation used	P
	-through warning signs and indicating devices, in particular, on the machinery;	Warning signs are applied on the machinery.	P
	d) the human ability to avoid or limit harm (for example, reflex, agility, possibility of escape);		P
	e) practical experience and knowledge, for example,		P
	-of the machinery,		P
	-of similar machinery,		P
	-no experience.		P
5.5.3	Aspects to be considered during risk estimation		-
5.5.3.1	Persons exposed		-
	Risk estimation shall take into account all persons (operators and others) for whom exposure to the hazard is reasonably foreseeable		P
5.5.3.2	Type, frequency and duration of exposure		-
5.5.3.3	Relationship between exposure and effects		-
5.5.3.4	Human factors		-
	Human factors can affect risk and shall be taken into account in the risk estimation.		P
5.5.3.5	Suitability of protective measures		-
	Risk estimation shall take into account the suitability of protective measures and shall	Recommended protective measures shall be supplied in manual	P
	a) identify the circumstances which can result in harm,		P
	b) whenever appropriate, be carried out using quantitative methods to compare alternative protective measures (see ISO/TR 14121-2), and		P
	c) provide information that can assist with the selection of appropriate protective measures.		P
	When estimating risk, those components and systems identified as immediately increasing the risk in case of failure need special attention.		P
5.5.3.6	Possibility of defeating or circumventing protective measures		-
	a) the protective measure slows down production or interferes with another activity or preference of the user,		P
	b) the protective measure is difficult to use,		P
	c) persons other than the operator are involved, or		P
	d) the protective measure is not recognized by the user or not accepted as being suitable for its function.		P



EN 60204-1			
Clause	Requirement – Test	Result - Remark	Verdict
5.5.3.7	Ability to maintain protective measures		-
	Risk estimation shall consider whether the protective measures can be maintained in the condition necessary to provide the required level of protection.	Protective measures shall be maintained in the condition	P
5.5.3.8	Information for use		-
	Risk estimation shall take into account the information for use, as available. See also 6.4.	See user manual or instructions	P
5.6	Risk evaluation		-
5.6.1	General		-
5.6.2	Adequate risk reduction		-
	Application of the three-step method described in 6.1 is essential in achieving adequate risk reduction.		P
	Following the application of the three-step method, adequate risk reduction is achieved when		P
	-all operating conditions and all intervention procedures have been considered,		P
	-the hazards have been eliminated or risks reduced to the lowest practicable level,		P
	-any new hazards introduced by the protective measures have been properly addressed,		P
	-users are sufficiently informed and warned about the residual risks (see 6.1, step 3),		P
	protective measures are compatible with one another,		P
	sufficient consideration has been given to the consequences that can arise from the use in a nonprofessional/non-industrial context of a machine designed for professional/industrial use, and		P
	the protective measures do not adversely affect the operator's working conditions or the usability of the machine.		P
5.6.3	Comparison of risks		-
	As part of the process of risk evaluation, the risks associated with the machinery or parts of machinery can be compared with those of similar machinery or parts of machinery, provided the following criteria apply:		P
	-the similar machinery is in accordance with the relevant type-C standard(s);		P
	-the intended use, reasonably foreseeable misuse and the way both machines are designed and constructed are comparable;		P
	-the hazards and the elements of risk are comparable;		P
	-the technical specifications are comparable;		P
	-the conditions for use are comparable.		P
	The use of this comparison method does not eliminate the need to follow the risk assessment process as described in this International Standard for the specific conditions of use. For example, when a band saw used for cutting meat is compared with a band saw used for cutting wood, the risks associated with the different material shall be assessed.		P



EN 60204-1							
Clause	Requirement – Test	Result - Remark				Verdict	
No.	Hazards source		S	F		O	Risk Index
Mechanical hazards							
1.1	Crushing	N					
1.2	Shearing	N					
1.3	Cutting or severing	N					
1.4	Entanglement		1	1	1	1	0
1.5	Drawing-in or trapping		1	1	1	1	0
1.6	Impact	N					
1.7	Stabbing or puncture	N					
1.8	Friction or abrasion	N					
1.9	High pressure fluid injection or ejection	N					
1.10	The mechanical hazards are generated by:	N					
	shape	N					
	relative location	N					
	Stability against overturning	N					
	Mass and stability	N					
	mass and velocity	N					
	acceleration/deceleration	N					
	Inadequate mechanical	N					
	Potential energy of elastic elements (springs), or of liquids or gases under pressure or vacuum	N					
	working environment	N					
Electrical hazards							
2.1	Contact with live parts		1	1	1	1	1
2.2	Contact with parts which have become live under faulty conditions		1	1	1	1	1
2.3	Approach to live part under high voltage	N					
2.4	insulation not suitable	N					
2.5	Electrostatic phenomena		1	1	1	1	1
2.6	Thermal radiation or other phenomena such as projection of molten particles and chemical effects from short circuits, overloads etc.	N					
2.7	phenomena such as projection of molten particles or chemical effects from short-circuits or overloads	N					
Thermal hazards							

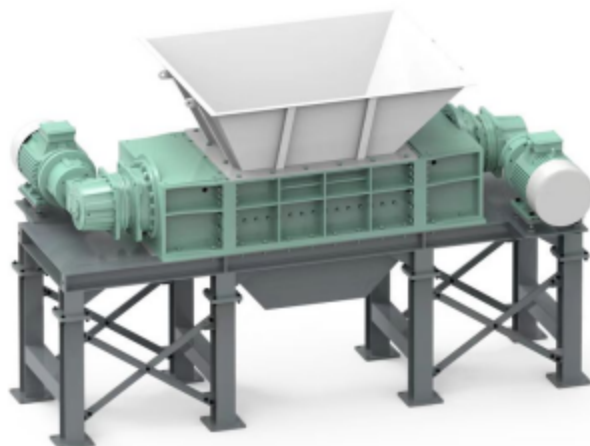


EN 60204-1							
Clause	Requirement – Test		Result - Remark				Verdict
3.1	Burns, scalds and other injuries by a possible contact of persons with objects or materials with an extreme high or low temperature, by flames or explosions and also by the radiation of heat sources	N					
3.2	Damage to health by hot or cold working environment	N					
Hazards generated by noise							
4.1	Hearing loss	N					
4.2	tinnitus	N					
4.3	tiredness, stress	N					
4.4	other effects such	N					
4.5	Interference with speech communication, acoustic signals, etc.	N					
Hazards generated by vibration							
5.1	Use of hand held machines resulting in a variety of neurological and vascular disorder	N					
5.2	Whole body vibration, particular when combined with poor postures	N					
Hazards generated by radiation							
6.1	Low frequency, radio frequency radiation, microwaves	N					
6.2	Infrared, visible and ultraviolet light	N					
6.3	Lasers	N					
6.4	X and gamma rays	N					
6.5	Alpha, beta rays, electron or ion beams, neutrons	N					
Hazards generated by materials and substances							
7.1	Hazards from contact with or inhalation of harmful fluids, gases, mists, fumes and dusts	N					
7.3	Biological and microbiological (viral or bacterial) Hazards	N					



EN 60204-1						
Clause	Requirement – Test		Result - Remark			Verdict
Hazards generated by neglecting ergonomic principles in machine design						
8.1	physiological effects (e.g. musculo-skeletal disorders) resulting, e.g. from unhealthy postures, excessive or repetitive efforts;	N				
8.2	psycho-physiological effects generated by, e.g. mental overload or under load, or stress, arising from the operation, supervision or maintenance of a machine within the limits of its intended use;	N				
8.3	Human error	N				
Slipping, tripping and falling hazards						
9	Neglecting the surface of the floorings and access means may result in injuries from slips, trips or falls.	N				
Hazard combinations						
10	Some individual hazards which seem to be minor can, when combined with each other, be equivalent to a significant hazard.	N				
Hazards associated with the environment in which the machine is used						
11	Where a machine is designed to operate under environmental conditions which can result in hazards (e.g. temperature, wind, snow, lightning) these hazards shall be taken into account.	N				

A.2 Photo documentation



Picture 1

*****END OF REPORT*****