

# MD REPORT

<b>Prepared For :</b>	<b>Guangzhou Huitong Machinery Co., Ltd</b>
<b>Product Name:</b>	<b>Excavator Bucket</b>
<b>Model(s):</b>	<b>HTGPB-1; HTHDB-2; HTSDB-3; HTSB-4; HTDB-5; HTTPB-6; HTSDB-7</b>
<b>Prepared By :</b>	<b>GUANGZHOU HUITONG MACHINERY CO., LTD</b>
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<b>Applicant name</b> .....:	Guangzhou Huitong Machinery Co., Ltd
Address.....:	No.1 Qiangang Street, Jinpen Industrial Park, Baiyun District, Guangzhou, Gunagdong, China
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Non-standard test method.....:	N/A
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<b>This report is specially limited to the above client company and product model only. It may not be duplicated without prior written consent.</b>	
<b>Test item description</b> .....:	Excavator Bucket
Trade Mark.....:	N/A
Manufacturer.....:	Guangzhou Huitong Machinery Co., Ltd
Model/Type reference.....:	HTGPB-1
Ratings.....:	N/A

**Assessment procedure and location:**

**Assessment Laboratory**.....: **GUANGZHOU HUITONG MACHINERY CO., LTD**  
**Address**.....: No.1 Qiangang Street, Jinpen Industrial Park, Baiyun  
District, Guangzhou, Gunagdong, China  
**Date of Assessment**.....: Apr 10, 2022  
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## **Part I : General**

### **1.1 General description**

This series Excavator Bucket does not belong to the machinery listed in Annex IV of 2006/42/EC, the machinery safety directive. Basically, this kind of machine belong to normal machine and with low risk when using it. All possible risk have been analysis in the assessment report and been prevent by suitable ways. The main risk of this series Excavator Bucket could be: -The risk of electricity shock of touching all electriferous components. - The risk of access to the drive transmission system In order to prevent the main risks mentioned above, the protection guarding system is provided, and all detail safety provision are constructed in accordance with the requirement of EN 13857.

In order to ensure the conformity for CE making for these machines, some main European and/or International standards have been used to made assessment of conformity, they are: -EN ISO12100:2010 for checking of safety of machinery for the Automatic assembly machine. The reports for these applicable standards in detail have been included in the relevant sub-clauses of this technical construction file.

### **1.2 Variations of the series products**

This series of machine have the same function, the technical and same structure. Only the dimensions, capacities and the technical specifications change in some extent.

### **1.3 Quality control system**

In order to ensure the conformity of the series production, the manufacturer has taken the related procedures mentioned below:

- (1) Apply for the consultant form the qualified body in china The manufacturer has applied for the consultant form who is a competent institute for the CE making consultant and certification in china. The compete technical construction file (TCF) have established before applying for the CE making certificate under the consultant.
- (2) Carry out the inspection for parts and components according to the TCF Before the assemblies of the series production, the QC engineers of manufacturer have to check and inspect technical specifications and intended function of parts and components to ensure the correct use of them according to the contents of TCF and principle described in the related technical information.
- (3) Carry out the inspection&testing for the products before packing the products, the QC engineers of manufacturer have to do the necessary inspection and testing to ensure the conformity of related requirements. In particular, the testing and inspection of electrical characteristics and outer feature.
- (4) Carry out the inspection for the packing After finishing the necessary inspection and testing for the products, an inspection for the packing has to be done to ensure the necessary elements being included in this packing before shipment.
- (5) Provision for the change of design Any change of the products described in this TCF must be checked in detail and written down again in the TCF by the designer of manufacturer if the change may effect the related electrical or mechanical characteristics.

(6) Provision for the Quality Assurance For the Provision of internal control measures to ensures to ensure the conformity of series production of the machines, manufacturer has built an internal quality control system in accordance with the international standard of ISO-9001.

#### **1.4 Declaration of conformity**

N/A

#### **1.5 List of applicable regulations and standard**

Fulfill the relevant provisions of European Directive 2006/42/EC(MD). The harmonized standards used in order to obtain compliance to 2006/42/EC(MD) is the following:  
EN ISO12100:2010-Safety of machinery-General principles for design-risk assessment and risk Reduction

**Part II : Assessment of conformity**  
**2.1 Essential health and safety requirements**

1	Essential health and safety requirements		-
1.1	General remarks		-
1.1.1	Definitions		-
1.1.2	Principles of safety integration		-
a)	Machinery must be constructed that it is fitted for its function, and can be adjusted and maintained without putting person at risk when these operations are carried out under the conditions foreseen by the manufacturer	These requirements have been complied with.	Pass
	The aim of measures taken must be to eliminate any risk of accident throughout the foreseeable lifetime of the machinery, including the phases of assembly and dismantling, even where risks of accident arise from foreseeable abnormal situations	These requirements have been complied with.	Pass
b)	In selecting the most appropriate methods, the manufacturer must apply the following principles, in the order given;		-
	- eliminate or reduce risks as far as possible	Manufacturer has provided enough safety devices to eliminate or reduce risks.	Pass
	- take the necessary protection measure in relation to risks that can't be eliminated	Safety guards and other devices are used.	Pass
	- inform users of the residual risks due to any shortcomings of the protection measures adopted, indicate whether any particular training is required and specify any need to provide personal protection equipment	Enough warnings are provided in the appropriate spot	Pass
c)	When designing and constructing machinery, and when drafting the instruction, the manufacturer must envisage not the normal use of the machinery but also uses which could reasonably be expected	All the conditions are considered by the manufacturer, and the related information also has been provided within the instruction manual	Pass
	The machinery must be designed to prevent abnormal use if such use would engender a risk. In other cases the instructions must draw the user's attention to ways which experience has shown might occur-in which the machinery should not be used	These requirements have been complied with, and the related information also has been provided within the instruction manual.	Pass

d)	Under the intended conditions of use, the discomfort, fatigue and psychological stress faced by the operator must be reduced to the minimum possible taking ergonomic principles into account	These requirements have been taken into account during the design of this machine	Pass
e)	When designing and constructing machinery, the manufacturer must taken account of the constraints to which the operator is subject as a result of the necessary or foreseeable use of personal protection equipment	These requirements have been taken into account during the design of this machine	Pass
f)	Machinery must be supplied with all the essential special equipment and accessories to enable it to be adjusted, maintained and used without risk	All the essential special equipment and related accessories have been supplied.	Pass
1.1.3	Materials and products		-
	The materials used to construct machinery or products used and created during its use must not endanger exposed persons' safety or health	They cannot endanger exposed person's safety or health	Pass
	In particular, where fluids are used, machinery must be designed and constructed for use without risks due to rilling, use, recovery of draining		Not applicable
1.1.4	Lighting		-
	The manufacturer must supply integral lighting suitable for the operations concerned where its lack is likely to cause a risk despite ambient lighting of normal intensity	These requirements have been taken into account during the design of this machine.	Pass
	The manufacturer must ensure that, there is no area of shadow likely to cause nuisance, that there is no irritating dazzle and that there are no dangerous stroboscopic effects due to the lighting provided by the manufacturer		Not applicable
	Internal parts requiring frequent inspection, and adjustment and maintenance areas, must be provided with appropriate lighting		Not applicable
1.1.5	Design of machinery to facilitate its handling		-
	Machinery or each component part thereof must:		-
	-be capable of being handle safely	Enough measures have been taken to ensure the safe of the handling.	Pass
	-be packaged or designed so that it can be stored safely and without damage	The machine can be stored in fumigation wooden case safely and without damage.	Pass
	Where the weight, size or shape of machinery or its various component parts prevents them from being moved by hand, the machinery or each		-



	components part must:		
	-either be fitted with attachments for lifting gear, or		Not applicable
	-be designed so that it can be fitted with such attachments, or	provided	Pass
	-be shaped in such a way that standard lifting can easily be attached		Not applicable
	Where machinery or one of its component parts is to be moved by hand, it must:		-
	-either be easily movable, or		Not applicable
	-be equipped for picking up and moving in complete safety		Not applicable
	Special arrangement must be made for the handling of tools and/or machinery parts, even if lightweight, which could be dangerous		Not applicable
1.2	Controls		-
1.2.1	Safety and reliability of control systems		-
	Control systems must be designed and constructed so that they are safe and reliable, in a way that will prevent a dangerous situation arising	The control system for this machine is safe and reliable by appropriate designing	Pass
	Above all they must be designed and constructed:		-
	-they can withstand the rigors of normal use and external factors	The control system can withstand related effects during normal operation.	Pass
	-errors in logic don't lead to dangerous situations		Not applicable
1.2.2	Control devices		-
	Control devices must be:		-
	-clearly visible and identifiable and appropriately marked where necessary	Appropriate labels and markings are provided This requirement has been complied with.	Pass
	-positioned for safe operation without hesitation or loss of time, and without ambiguity	Appropriate positions have been taken into account during design	Pass
	-designed so that the movement of the control is consistent with its effect		Not applicable
	-located outside the danger zones, except for certain controls where necessary, such as emergency stop, console for training of robots		Not applicable
	-positioned or that their operation can't cause additional risk	All operation of control devices won't cause additional risk.	Pass

	- designed or protected so that the desired effect, where a risk is involved, can't occur without an intentional operation	Appropriate safety devices have been used to comply with this requirement.	Pass
	- made so as to withstand foreseeable strain, particular attention must be paid to emergency stop devices liable to be subjected to considerable strain	.	Not applicable
	Where a control is designed and constructed to perform several different actions, namely where there is no one-to-one correspondence, the action to be performed must be clearly displayed and subject to confirmation where necessary		Not applicable
	Controls must be so arranged that their layout, travel and resistance to operation are compatible with the action to be performed, taking account of ergonomic principles	These requirements have been taken into account during design.	Pass
	Constraints due to the necessary foreseeable use of personal protection equipment must be taken into account		Not applicable
	Machinery must be fitted with indicators as required for safe operation	The indicators have been provided.	Pass
	The operator must be able to read them from the control position	The indicators are clearly visible in the control position.	Pass
	From the main control position the operator must be able to ensure that there are no exposed persons in the danger zones	The danger zones are visible for the operator in the main control position.	Pass
	If this is impossible, the control system must be designed and constructed so that an acoustic and/or visual warning signal is given whenever the machinery is about to start		Not applicable
	The exposed person must have the time and the means to take rapid action to prevent the machinery starting up	Emergency stop, main switch and other related devices have been provided for the exposed person.	Pass
1.2.3	Starting		-
	It must be possible to start machinery only by voluntary actuation of a control provided for the purpose	Devices preventing unintended starting have been provided.	Pass
	The same requirement applied:		-
	-when restarting the machinery after stoppage, whatever the cause	Reset is necessary before restarting.	Pass
	-when effecting a significant change in the operating conditions		Not applicable
	Unless such restarting or change in operating		-

	conditions is without risk to exposed persons		
	This essential requirement doesn't apply to the restarting of the machinery or to the change in operating conditions resulting from the normal sequence if an automatic cycle		Not applicable
	Where machinery has several starting controls and the operators can therefore put each other in danger, additional devices must be fitted to rule out such risks		Not applicable
	It must be possible for automated plant functioning in automatic mode to be restarted easily after a stoppage once the safety conditions have been fulfilled		Not applicable
1.2.4	Stopping device		-
	Normal stopping		-
	Each machine must be fitted with a control whereby the machine can be brought safely to a complete stop	A normal stop control has been provided.	Pass
	Each workstation must be fitted with a control to stop some or all of the moving parts of the machinery, depending on the type of hazard, so that the machinery is rendered safe	A normal stop control has been provided.	Pass
	The machinery's stop control must have priority over the start controls	It has priority over the start control.	Pass
	Once the machinery or its dangerous parts have stopped, the energy supply to the actuators concerned must be cut off	The stops belong to the category 0, or category 1 stops.	Pass
	Emergency stop		-
	Each machinery must be fitted with one or more emergency stop devices to enable actual or impending danger to be averted		Not applicable
	The following exceptions apply:		-
	-machines in which an emergency stop device would not lessen the risk, either because it would not reduce the stopping time or because it would not enable the special measures required to deal with the risk to be taken		Not applicable
	The emergency stop device must:		-
	-have clearly identifiable, clearly visible and quickly accessible controls		Pass
	-stop the dangerous process as quickly as possible, without creating additional hazards		Pass
	-where necessary, trigger or permit the triggering of certain safeguard movements		Not applicable

	Once active operation of the emergency stop control has ceased following a stop command, that command must be sustained by engagement of the emergency stop device until that engagement is specifically overridden		Not applicable
	It must be possible to disengage the device only by an appropriate operation, and disengaging the device must not restart the machinery but only permit restarting		Not applicable
	Complex installations		-
	In the case of machinery or parts of machinery designed to vwork together, must so design and construct the machinery that the stop controls, including the emergency stop, can stop not only the machinery itself but also all equipment upstream and/or downstream if its continued operation can be dangerous		Not applicable
1.2.5	Mode selection		-
	The control mode selected must override all other control systems with the exception of the emergency stop		Not applicable
	If machinery has been designed and built to allow for its use in several control or operating modes presenting different safety levels, it must be fitted with a mode selector which can be locked in each position		Not applicable
	Each position of the selector must correspond to a single operating or control mode	No this kind of mode selection has been found.	Not applicable
	The selector may be replaced by another selection method which restricts the use of certain functions of the machinery or certain categories of operator	No this kind of mode selection has been found	Not applicable
	If for certain operations, the machinery must be able to operate with its protection devices neutralized, the mode selector must simultaneously	No this kind of mode selection has been found	Not applicable
	- Disable the automatic control mode		Not applicable
	- Permit movements only by controls requiring sustained action		Not applicable
	- Permit the operation of dangerous moving parts only in enhanced safety conditions while preventing hazards from linked sequences		Not applicable
	- Prevent any movement liable to pose a danger by		Not applicable

	acting voluntarily or involuntarily on the machine's internal sensors		
	In addition, the operator must be able to control operation of the parts he is working on at the adjustment point	No this kind of mode selection has been found	Not applicable
1.2.6	Failure of the power supply		-
	The interruption, re-establishment after an interruption or fluctuation in whatever manner of the power supply to the machinery must not lead to a dangerous situation	No any dangerous situation has been found	-
	In particular:		-
	-the machinery must not start unexpectedly	Reset is necessary before restarting the machine	-
	- the machinery must not be prevented from stopping if the command has already been given		Not applicable
	- no moving part of the machinery or piece held by the machinery must fall or be ejected	No such part is found	-
	- automatic or manual stopping of the moving parts whatever they may be must be unimpeded		Not applicable
	-the protection devices must remain fully effective	The protection devices main effective after the failure	-
1.2.7	Failure of the control circuit		-
	A fault in the control circuit, or failure of or damage to the control circuit must not lead to dangerous situations	No dangerous situation is found.	-
	In particular:		-
	- the machinery must not start unexpectedly	Reset is necessary before restarting the machine	-
	-the machinery must not be prevented from stopping if the command has already been given		Not applicable
	-no moving part of the machinery or piece held by the machinery must fall or be ejected	No such part is found	-
	-automatic or manual stopping of the moving parts whatever they may be must be unimpeded		Not applicable
	-the protection device must remain fully effective	The protection devices remain effective after the failure of the control circuit	-
1.2.8	Software		-
	Interactive software between the operator and the command or control system of a machine must be user-friendly		Not applicable
1.3	Protection against mechanical hazards		-

1.3.1	Stability		-
	Machinery, components and fittings thereof must be so designed and constructed that they are stable enough, under the foreseen operating conditions for use without risk of overturning, falling or unexpected movement	These requirements have been taken into account design	Pass
	If the shape of the machinery itself or its intended installation doesn't offer sufficient stability, appropriate means of anchorage must be incorporated and indicated in the instructions	The sufficient stability has been offered for this machine	Pass
1.3.2	Risk of break-up during operation		-
	The various parts of machinery and their linkages must be able to withstand the stress to which they are subject when used when as foreseen by the manufacturer	All parts of the machine can withstand related stress when they are used.	Pass
	The durability of the materials used must be adequate for the nature of the workplace foreseen by the manufacturer, in particular as regards the phenomena of fatigue, aging, corrosion and abrasion	All materials used for this machine are appropriate for their intended use and have adequate life	Pass
	The manufacturer must indicate in the instructions the type and frequency of inspection and maintenance required for safety reasons, where appropriate, indicate the parts subject to wear and the criteria for replacement	The related information have been provided within the instruction manual.	Pass
	Where a risk of rupture or disintegration remains despite the measures taken the moving parts must be mounted and positioned in such a way that in case of rupture their fragments will be contained	No such risk is possible.	Pass
	Both rigid and flexible pipes carrying fluids, particularly those under high pressure, must be able to withstand the foreseen internal and external stresses and must be firmly attached and/or protected against all manner to external stresses and strains, precaution must be taken to ensure that no risk is posed by a rupture	This requirement has been taken into account during design.	Pass
	Where the material to be processed is fed to the tool automatically, the following conditions must be fulfilled to avoid risks to the persons exposed:		-
	- when the work piece comes into contact the tool the later must have attained its normal working conditions		Not applicable
	- when the tool starts and/or stops the feed	Both are coordinated.	Not applicable

	movement and the tool movement must be coordinated		
1.3.3	Risked due to falling or ejected objects		-
	Precautions must be taken to prevent risks from falling or ejected object		No applicable
1.3.4	Risks due to surfaces, edges or angles		-
	In so far as their purpose allows, accessible parts of the machinery must have no sharp edges, no sharp angles, and no rough surfaces likely to cause injury	No this kind injury has been found	No applicable
1.3.5	Risks related to combined machinery		-
	When the machinery is intended to carry out several different operations with the manual removal of the piece between each operation, it must be designed and constructed in such a way as to enable each element to be used separately without the other element constituting a danger or risk for the exposed person	No this kind of combined machinery.	Not applicable
	For this purpose, it must be possible to start and stop separately and elements that are not protected	No this kind of combined machinery	Not applicable
1.3.6	Risks relating to variations in the rotation speeds of tools		-
	When the machine is designed to perform operations under different conditions of use, it must be designed and constructed in such a way that selection and adjustment of these conditions can be carried out safely reliably		Not applicable
1.3.7	Prevention of risks related to moving parts		-
	The moving parts of machinery must be designed, built and laid out to avoid hazards or, where hazards persist, fixed with guards or protective devices in such a way as to prevent all risk of contact which could lead to accidents		Not applicable
	All necessary steps must be taken to prevent accidental blockage of moving parts involved in the work		Not applicable
	In cases where, despite the precaution taken, a blockage is likely to occur, specific protection devices or tools, the instruction handbook and possibly a sign on the machinery should be provided by the manufacturer to enable the equipment to be safely unblocked		Not applicable
1.3.8	Choice of protection against risk related to		-

	moving parts		
	Guards or protection devices used to protect against the risks related to moving parts must be selected on the basis of the type of risk	It is accordance with the risk assessment	Pass
	The following guidelines must be used to help make the choice		-
	Moving transmission parts Guards designed to protect exposed persons against the risks associated with moving transmission parts must be:		-
	-either fixed, complying with requirements 1.4.1 and 1.4.2.1 or	See the related clauses.	Pass
	-movable, complying with requirements 1.4.1 and 1.4.2.2.A	See the related clauses.	Pass
	A moving parts directly involved in the process Guards or protection devices designed to protect exposed persons against the risks associated with moving parts contributing to the work must be		-
	-wherever possible fixed guards complying with requirements 1.4.1 and 1.4.2.1	See the related clauses.	Pass
	-otherwise, movable guards complying with requirements 1.4.1 and 1.4.2.2.B or protection devices intended automatically to prevent all part of the operator's body from encroaching to the danger zone in accordance with requirements 1.4.1 and 1.4.3	See the related clauses.	Pass
	However, when certain moving parts directly involved in the process can't be completely or partially inaccessible during operation owing to operations requiring near-by operator intervention, where technically possible such parts must be fitted with:		-
	-fixed guards, complying with requirements 1.4.1 and 1.4.2.1 preventing access to those sections of the parts that are not used in the work	See the related clauses.	Pass
	-adjustable guards, complying with requirements 1.4.1 and 1.4.2.3 restricting access to those sections of the moving parts that are strictly for the work	See the related clauses.	Pass
1.4	Required characteristics of guards and protection devices		-
1.4.1	General requirement		-
	Guards and protection devices must:		-
	-be of robust construction	All the guards have enough	Pass



		strength.	
	-not give rise to any additional risk	No additional risk is found.	Pass
	-not be easy to bypass or render non-operational	All the guards can't be bypassed or rendered non-operational by design.	Pass
	-be located at an adequate distance from the danger zone	All the guards comply with the safety distances.	Pass
	-cause minimum obstruction to the view the production process	Appropriate materials are used to make guards.	Pass
	-enable essential work to be carried out on installation and/or replacement of tools and also for maintenance by restricting access only to the area where the work has to be done,if possible without the guard or protection device having to be dismantled		Pass
1.4.2	Special requirements for guards		-
1.4.2.1	Fixed guards		-
	Fixed guards must be fixed by systems that can be opened or removed only with tools	They all can be opened only with tools.	Pass
	Their fixing systems must remain attached to the guards or to the machinery when the guards are removed	Yes,they are attached to the guards because the screws are fixed by nutcap.	Pass
	Where possible,guards must be incapable of remaining in place without their fixings		Pass
1.4.2.2	Movable guards		-
	A.Type A movable guards must:		-
	-as far as possible remain fixed to the machinery when open		Not applicable
	-be associated with a locking device to prevent moving parts starting up as these parts can be accessed and to give a stop command whenever they are no longer closed		Not applicable
	B.Type B movable guards must be designed and incorporated into the control system so that		Not applicable
	-moving parts can't start up while they are within the operator's reach		Not applicable
	-the exposed person can't reach moving parts once they have started up		Not applicable
	-they can be adjusted only by means of an intentional action,such as the use of a tool,etc		Not applicable
	-the absence or failure of one of their components prevents starting or stops the		Not applicable

	moving parts		
	-protection against any risk of ejection is provided by means of an appropriate barrier		Not applicable
1.4.2.3	Adjustable guards restricting access		-
	Adjustable guards restricting access to those areas of the moving parts strictly necessary for the work must:		Not applicable
	-be adjustable manually or automatically according to the type of work involved		Not applicable
	-be readily adjustable without the use of tools		Not applicable
	-reduce as far as possible the risk of ejection		Not applicable
1.4.3	Special requirements for protection devices		-
	Protection devices must be designed and incorporated into the control system so that:		-
	-moving parts can't start up while they are within the operator's reach		Not applicable
	-the exposed person can't reach moving parts once they have started up		Not applicable
	-they can be adjusted only by means of an intentional action, such as the use of a tool, etc.		Not applicable
	-the absence or failure of one of their components prevents starting or stops the moving parts		Not applicable
1.5	Protection against other hazards		-
	Electricity supply		-
	Where machinery has an electricity supply it must be designed, constructed and equipped so that all hazards of an electrical nature are or can be prevented	See the EN 60204-1 test report in detail.	Pass
	The specific rules in force relating to electrical equipment designed for use within certain voltage limits must apply to machinery which is subject to those limits	See the EN 60204-1 test report in detail.	Pass .
1.5.2	Static electricity		-
	Machinery must be so designed and constructed as to prevent or limit the build-up of potentially dangerous electrostatic charges and/or be fitted with a discharging system	See the EN 60204-1 test report in detail.	-
1.5.3	Energy supply other than electricity		-
	Where machinery is powered by an energy other than electricity, it must be so designed, constructed and equipped as to avoid all potential hazards associated with these types of energy	No any additional hazard has been found for energy supply.	Not applicable

1.5.4	Error of fitting		-
	Errors likely to be made when fitting or refitting certain parts which could be a source of risk must be made Impossible by the design of such parts or, failing this, by information on moving parts and/or their housing where the direction of movement must be known to avoid a risk	These requirements have been taken into account during design.	Pass
	Any further information that may be necessary must be given in the instructions	The related information has been provided within the instruction manual.	Pass
	Where a faulty connection can be the source of risk, incorrect fluid connections,including electrical conductors, must be made impossible by the design or, failing this, by information given on the pipes, cables, etc. and/or connectors blocks	All related information have been provided within the instruction manual. Necessary labels and markings have been provided.	Pass
1.5.5	Extreme temperatures		-
	Step must be taken to eliminate any risk of injury caused by contact with or proximity to machinery parts or materials at high or very low temperatures		Not applicable
	The risk of hot or very cold materials being ejected should be assessed. Where this risk exists, the necessary steps must be taken to prevent it or, if this is not technically possible,to render it non-dangerous	No this kind of risk exists	Not applicable
1.5.6	Fire		-
	Machinery must be designed and constructed to avoid all risk of fire or overheating posed by the machinery itself of by gases ,liquids, dusts, vapors or the other substances produced or used by the machinery	The design and construction of this machine are in conformity with these requirements.	Pass
1.5.7	Explosion		-
	Machinery must be designed and constructed to avoid any risk of explosion posed by the machinery itself or by gases, liquids, dusts, vapors or other substances produced or used by the machinery	No such risk is found.	Not applicable
	To that end the manufacturer must take steps to:		-
	-avoid a dangerous concentration of products		Not applicable
	-prevent combustion of the potentially explosive atmosphere		Not applicable
	-minimize any explosion which may occur so that it doesn't endanger the surroundings		Not applicable

	The same precautions must be taken if the manufacturer foresees the use of the machinery in potentially explosive atmosphere	This machine is not intended to be used in potentially explosive atmosphere.	Not applicable
1.5.8	Electrical equipment forming part of the machinery must conform, as far as the risk from explosion is concerned, to the provision of the specific directive in force		Pass
1.5.8	Noise		-
	Machinery must be so designed and constructed that risks resulting from the emission of airborne noise are reduced to the lowest level taking accounting of technical progress and the availability of means of reducing noise, in particular at source	The design and construction of this machine are in conformity with this requirements.	Pass
1.5.9	Vibration		-
	Machinery must be so designed and constructed that risks resulting from the vibrations produced by the machinery are reduced to the lowest level, taking account of technical progress and the availability of means of reducing vibration, in particular at source	The design and construction of this machine are in conformity with this requirements. Vibrations of this machine will not creat any risk.	Pass
1.5.10	Radiation		-
	Machinery must be so designed and constructed that any emission of radiation is limited to the extent necessary for its operation and that the effects on exposed persons non-existent or reduced to non-dangerous proportions		Not applicable
1.5.11	External radiation		-
	Machinery must be so designed and constructed that external radiation doesn't interfere with its operation		Not applicable
1.5.12	Laser equipment		-
	Where laser equipment is used ,the following provisions should be taken into account;	No laser equipment has been used.	Not applicable
	-laser equipment on machinery must be designed and constructed so as to prevent any accidental radiation		Not applicable
	-laser equipment on machinery must be protected so that effective radiation, radiation produced by reflection or diffusion and secondary radiation don't damage health		Not applicable
	-optical equipment for the observation or adjustment		Not applicable

	of laser equipment on machinery must be such that on health risk is created by the laser rays		
1.5.13	Emission of dust, gases, etc		-
	Machinery must be so designed, constructed and/or equipment that risk due to gases, liquids, dust, vapors and other waste materials which it produces can be avoided		Not applicable
	Where a hazard exists, the machinery must be so equipped that the said substances can be contained and/or evacuated		Not applicable
	Where machinery is not enclosed during normal operation, the devices for containment and/or evacuation must be situated as close as possible to the source emission		Not applicable
1.5.14	Risk of being trapped in a machine		-
	Machinery must be so designed, constructed or fitted with a means of preventing a exposed person from being enclosed within it or, if that is impossible, with a means of summoning held	No this kind of hazard	Not applicable
1.5.15	Risk of slipping, tripping or falling		-
	Parts of the machinery where persons are liable to move about or stand must be designed and constructed to prevent persons slipping tripping or falling on or off these parts		Not applicable
1.6	Maintenance		-
1.6.1	Machinery maintenance		-
	Adjustment, lubrication and maintenance points must be located outside danger zones	The design and construction of this machine are in conformity with this requirements	Pass
	It must be possible to carry out adjustment, maintenance, repair, cleaning and servicing operations while machinery is at a standstill	Maintenance, repair, cleaning and servicing operations can only be implemented while machinery is at a standstill	Pass
	If one or more of the above conditions can't be satisfied for technical reasons, operations must be possible without risk	No this kind of situation	Not applicable
	In the case of automated machinery and, where necessary, other machinery, the manufacturer must take provision for a connecting device for mounting diagnostic fault-finding equipment		Not applicable

	Automated machine components which have to be changed frequently, in particular for a change in manufacture or where they are liable to wear or likely to deteriorate following an accident, must be capable of being removed and replaced easily and in safety		Not applicable
	Access to the components must enable these tasks to be carried out with the necessary technical means in accordance with an operating method specified by the manufacturer	All operation methods have been specified by the manufacturer	Pass
1.6.2	Access to operating position and servicing points		-
	The manufacturer must provide means of access to all areas used for production, adjustment and maintenance operations		Not applicable
1.6.3	Isolation of energy sources		-
	All machinery must be fitted with means to isolate it from all energy sources		Pass
	Such isolators must be clearly identified		Pass
	They must be capable of being locked if reconnection could endanger exposed persons		Not applicable
	In the case of machinery supplied with electricity through a plug capable of being plugged into a circuit, separation of the plug is sufficient		Not applicable
	The isolator must be capable of being locked also where an operator is unable ,from any of the points to which he has access ,to check that the energy is still cut off	The isolator can be locked in the off position	Pass
	After the energy is cut off, it must be possible to dissipate normally any energy remaining or stored in the circuits of the machinery without risk to exposed persons	All the parts will not be live after the energy is cut off.	Pass
	As an exception to the above requirement, certain circuits may remain connected to their energy source in order, for example, to hold parts, protect information, light interiors, etc. In this case, special steps must be taken to ensure operator safety	No this kind of situation	Not applicable
1.6.4	Operator intervention		-
	Machinery must be so designed,constructed and equipped that the need for operator intervention is limited		Not applicable
	If operator intervention can't be avoided, it must be possible to carry it out easily and in safety	No this kind of situation	Not applicable

1.6.5	Cleaning of internal parts		-
	The machinery must be designed and constructed in such a way that it is possible to clean internal parts which have contained dangerous substances or preparations without entering them;any necessary unblocking must also be possible form the outside .	The design of this machine is allowed to carried out this work	Pass
	If it is absolutely impossible to avoid entering the machinery, the manufacturer must take steps during its construction to allow cleaning to take place with the minimum of danger .	No this kind of situation	Not applicable
1.7	Indicators		-
1.7.1	Information devices		-
	The information needed to control machinery must be unambiguous and easily understood	The information is identified clearly and can be easily understood	Pass
	It must not be excessive to the extent of overloading the operator		Pass
	Where the health and safety of exposed persons may be endangered by a fault in the operation of unsupervised machinery, the machinery must be equipped to give an appropriate acoustic or light signal as a warning		Pass
1.7.2	Warning devices		-
	Where machinery is equipped with warning devices, these must be unambiguous and easily perceived		-
	The operator must have facilities to check the operation of such warning devices at all times		-
	The requirements of the specific directives concerning colors and safety signals must be complied with		-
1.7.3	Warning of residual risks		-
	Where risks remain despite all the measure adopted or in the case of potential risk which are not evident, the manufacture must provide warning	No any residual risk has been found	Not applicable
	Such warning should preferably use readily understandable pictograms and\or be drawn up in one of the languages of the country in which the machinery is to be used, accompanied, on request, by the languages understood by the operator		Not applicable
1.7.4	Marking		-

	All machinery must be marked legibly and indelibly with the following minimum particular:		-
	Name and address of the manufacturer	Name and address of the manufacturer has been marked has been marked in the nameplate	Pass
	CE mark, which includes the year of construction		Pass
	Designation of series or type	Designation of series or type has been marked in the nameplate	Pass
	Serial number, if any	Serial number has been marked in the nameplate	Pass
	Further more,where the manufacturer constructs machinery intended for use in a potentially explosive atmosphere, this must be indicated on the machinery	This machine is not intended to be used in a potentially explosive atmosphere	Not applicable
	Machinery must also bear full information relevant to its type and essential to its safe use	Such information is provided	Pass
	Where a machine part must be handled during use with lifting equipment, its mass must be indicated legible, indelibly and unambiguously		Not applicable
	The interchangeable equipment referred to in article 1(2), third subparagraph, must bear the same information	All the related information is provided legible, indelibly and unambiguously.	Pass
1.7.5	Instruction		-
	a)All machinery must be accompanied by instructions including at least the following :		-
	a repeat of the information with which the machinery is marked, except the serial number, together with any appropriate additional information to facilitate maintenance	All related information has been provided within the instruction manual I	Pass
	-foreseen use of the machinery within the meaning of 1.1.2(c)	All related information has been provided within the instruction manual	Pass
	-workstation(s) likely to be occupied by operators	All related information has been provided within the instruction manual	Pass
	- instructions for safe	All related information has been provided within the instruction manual	Pass
	- putting into service	All related information has been provided within the	Pass



		instruction manual	
	-use		-
	-handing, giving the mass of the machinery and its various parts where they are regularly to be transported separately	All related information has been provided within the instruction manual	Pass
	- installation	All related information has been provided within the instruction manual	Pass
	- assembling, dismantling		Pass
	- adjustment		Pass
	- maintenance (servicing and repair)		Pass
	-where necessary, training instructions		Pass
	Where necessary, the essential characteristics of tools which may be fitted to the machinery		Pass
	Where, necessary, the instructions should draw attention to ways in which the machinery should not be used	All related information has been provided within the instruction manual	Pass
	b)The instructions must be drawn up in one of the community languages by the manufacturer or his authorized representative established in the community	Chinese and English versions of the instruction manual is provided	Pass
	On being put into service, all machinery must be accompanied by a translation of the instructions in the language or languages of the country in which the machinery is to be used and by the instructions in the original language	English versions of the instruction manual is provided.	Pass
	This translation must be done either by the manufacturer or his authorized representative established in the community or by the person introducing the machinery into the language area in question	The translation is done by the manufacturer.	Pass
	By way of derogation from this requirement, the maintenance instructions for use by the specialized personnel employed by the manufacturer or his authorized representative established in the Community may be drawn up in only one of the Community languages understood by that personnel		Pass
	c)The instructions must contain the drawing and diagrams necessary for putting into service, maintenanc inspection, checking of correct operation and, where appropriate, repair of the machinery and all useful instructions in particular	All related information has been provided within the instruction manual	Pass

	with regard to safety		
	d) any literature describing the machinery must not contradict the instructions as regards safety aspects	No such situation exist.	Pass
	The technical documentation describing the machinery must give information regarding the airborne noise emission referred to in(f) and, in the case of hand-held and/or hand-guided machinery, information regarding vibration as referred to in 2.2	All related information has been provided within the technical documentation.	Pass
	e) Where necessary, the instructions must give the requirement relating to installation and assembly for reducing noise or vibration		Not applicable
	f) The instructions must give the following information concerning airborne noise emission by the machinery, either the actual value or a value established on the basis of measurements made on identical machinery:		-
	equivalent continuous A-weighted pressure level at workstations, where this exceeds 70 dB(A); where this level doesn't exceed 70dB(A), this fact must be indicated	The noise pressure level is 65dB.	Pass
	peak C-weighted instantaneous sound pressure value at workstations, where this exceeds 63 Pa(130 dB in relation to 20 mPa)		Not applicable
	sound power level emitted by the machinery where the equivalent continuous a weight sound pressure level at workstations exceeds 85 dB(A)		Not applicable
	In the case of very large machinery, instead of the sound power level, the equivalent continuous sound pressure levels at specified positions around the machinery may be indicated	This machine is not a very large machinery.	Not applicable
	Where the harmonized standards are not applied sound levels must be measured using the most appropriate method for the machinery	Appropriate standards are applied to determine the sound level.	Pass
	The manufacturer must indicate the operating conditions of the machinery during measurement and what methods have been used for the measurement	All related information has been provided within the technical documentation.	Pass
	Where the workstation(s) are undefined or can't be defined, sound pressure levels must be measured at a distance of 1 meter from the surface of the machinery and at a height of 1.60 meters from the floor or access platform	The workstation has been defined.	Pass
	The position and value of the maximum sound	It has been indicated in the	Pass

	pressure must be indicated	appropriate position of the machine.	
	g) If the manufacturer foresees that the machinery will be used in a potentially explosive atmosphere, the instructions must give all the necessary information	This machine is not intended to be used in a potentially explosive atmosphere.	Not applicable
	h) In the case of machinery which may also be intended for use by non-professional operators, the wording and layout of the instructions for use, whilst respecting the other essential requirement mentioned above, must take into account the level of general education and acumen that can reasonably be expected from such operators	All these requirements have been taken into account.	Pass
2	Essential health and safety requirements for certain categories of machinery		-
2.1	Agri-foodstuffs machinery		-
	Where machinery is intended to prepare and process foodstuffs, it must be so designed and constructed as to avoid any risk of infection, sickness or contagion and the following hygiene rules must be observed:		Not applicable
	a) materials in contact, or intended to come into contact, with the foodstuffs must satisfy the conditions set down in the relevant directives		Not applicable
	The machinery must be so designed and constructed that these materials can be clean before each use		Not applicable
	b) all surfaces including their joinings must be so smooth, and must have neither ridges nor crevices which could harbor organic materials		Not applicable
	c) assemblies must be designed in such a way as to reduce projections, edges and recesses to a minimum		Not applicable
	They should preferably be made by welding or continuous bonding		Not applicable
	Screws, screw heads and rivets may not be used except where technically unavoidable		Not applicable
	d) all surfaces in contact with the foodstuffs must be easily cleaned and disinfected, where possible after removing easily dismantled parts		Not applicable
	The inside surfaces must have curves of a radius sufficient to allow through cleaning		Not applicable
	e) liquid deriving from foodstuffs as well as cleaning disinfecting and rinsing fluids should be able to be		Not applicable

	discharged from the machine without impediment		
	f) machinery must be so designed and constructed as to prevent any liquids or living creatures, in particular insects, entering, or any organic matter accumulating in area that can't be cleaned		Not applicable
	g) machinery must be so designed and constructed that no ancillary substances can come into contact with foodstuffs		Not applicable
	Where necessary, machinery must be designed and constructed so that continuing compliance with this requirement can be checked		Not applicable
	Instructions		Not applicable
	In addition to the information required in Section 1, the instructions must indicate recommended products and methods for cleaning, disinfecting and rinsing(not only for easily accessible areas but also where areas to which access is impossible or inadvisable, such as piping, have to be cleaned in it situ)		Not applicable
2.2	Portable hand-held and or hand-guided machinery		-
	Portable hand-held and/or hand-guided machinery must conform to the following essential health and safety requirements:		-
	-according to the type of machinery, it must have a supporting surface of sufficient size and have a sufficient number of handles and supports of an appropriate size and arranged to ensure the stability of the machinery under the operating conditions foreseen by the manufacturer		Not applicable
	-except where technically impossible or where there is an independent control, in the case of handles which can't be released in complete safety, it must be fitted with start and stop controls arranged in such a way that the operator can operate them without releasing the handles		Not applicable
	-it must be designed, constructed or equipped to eliminate the risks of accidental starting and/or continued operation after the operator has released the handles		Not applicable
	Equivalent steps must be taken if the requirement is not technically feasible		Not applicable
	-portable hand-held machinery must be designed and constructed to allow, where necessary, a visual check		Not applicable

	of the contact of the tool with the material being processed		
	Instructions		-
	The instructions must give the following information concerning vibrations transmitted by hand-held and hand-guided machinery		-
	-the weight root mean square value to which the arms are subjected, if it exceed $2.5 \text{ m/s}^2$ as determined by the appropriate test code		Not applicable
	Where the acceleration doesn't exceed $2.5 \text{ s/m}^2$ , this must be mentioned		Not applicable
	If there is no applicable test code, the manufacturer must indicate the measurement methods and conditions under which measurement were made		Not applicable
2.3	Machinery for working wood and analogous materials		-
	Machinery for working wood and machinery for working materials with physical and technology characteristics similar to those of wood, such as cork, bone, hardened rubber, hardened plastic material and other similar stiff material must conform the following essential health and safety requirements		-
	a) the machinery must be designed, constructed or equipped so that the piece being machined can be placed and guided in safety, where the piece is hand-held on a work-bench the latter must be sufficiently stable during the work and must not impede the movement of the piece	This requirement has been taken into account during design	Pass
	b) where the machinery is likely to be used in conditions involving the risk of ejection of pieces of wood, it must be designed, constructed or equipped to eliminate this ejection, or, if this is not the case, so that the ejection doesn't engender risks for the operator and or exposed persons		Not applicable
	c) the machinery must be equipped with an automatic brake that stops the tool in a sufficiently short time if there is a risk of contact with the tool whilst it runs down		Not applicable
	d) where the tool is incorporated into a non-fully automated machine, the latter must be so designed and constructed as eliminate or reduce the risk of serious accidental injury		Not applicable
3	Essential health and safety requirement to offset		-

	the particular hazards due to the mobility machinery		
4	Essential health and safety requirement to offset the particular hazards due to a lifting operation		-
5	Essential health and safety requirement for machinery intended for underground work		-
6	Essential health and safety requirement to offset the particular hazards due to the lifting or moving of persons		-

## 2.1 Risk assessment

### I. Introduction.

In general this risk assessment report for Excavator Bucket and its variants made by Guangzhou Huitong Machinery Co., Ltd was carried out in accordance with the requirements of Machinery Directive and the standards of EN ISO 12100:2010, in which an explicit risk level is evaluated with 4 factors described in next clause.

After the first assessment, some measures to eliminate the risks are given for the modification of machine or of relative documents with taking into account the explicit C-type EN standard or related B-type standard.

While taking appropriate provisions for the existing risks, the procedures and principles to eliminate the risk according to the most general B-type standard for any kind of machine, EN 12100:2010, are followed, i.e.:

- First step: consider the possibility of eliminating risk at design stage.
- Second step: if impossible, protect the dangerous zone with appropriate design of safety guard or safety device.
- Third step: If above impossible, give warning signs to draw attention of operators about the residual risks.

In addition, some check list drawn from the explicit C-type EN standards, which are found suitable for or near the characteristic of this machine, are used to help developing the provisions for the elimination of the risks.

Finally the risk assessment was carried out again to ensure this machine and its relative documents are totally compliance with the Machinery Directive.

## II. Risk assessment Methodology

This risk assessment report is based on the methods mentioned in the EN ISO 12100:2010 standards, and the 4 factors S-A-G-W have been used for evaluating the level of risks.

(a)S: Severity of harm

- S1: Slight (normally reversible)
- S2: Serious (normally irreversible)
- S3: Cause a few men die
- S4: Calamity or cause many men die

(b)A: Frequency and duration of exposure

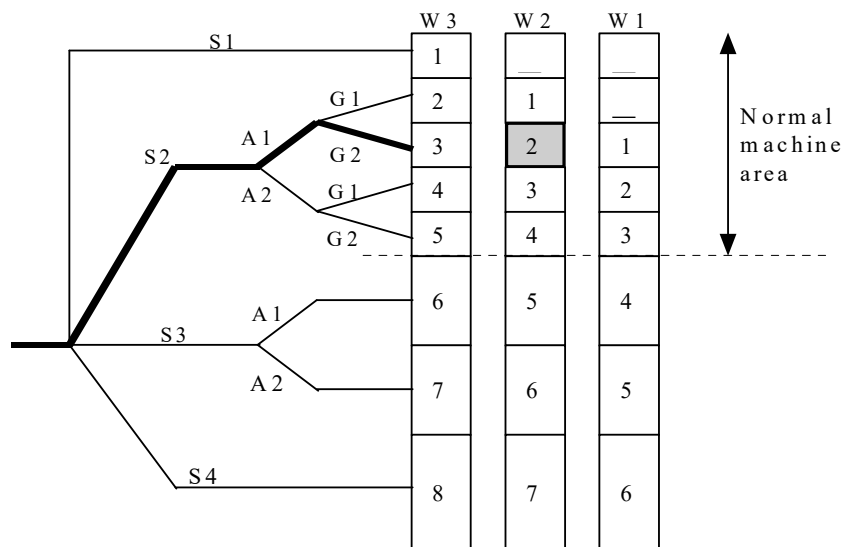
- A1: Seldom to very often
- A2: Frequent to continuous

(c)G: Possibilities of avoidance

- G1: Possible
- G2: Impossible

(d)W: Probability of occurrence of harm

- W1: Low
- W2: Medium
- W3: High



### Solutions for the level of hazards

- 1: Protected by warning sign
- 2: Protected by guard and warning sign
- 3: Consider the other design, choose the best one, and add both guard and warning sign
- 4: Consider another two designs, choose the best one, and add both guard and warning sign
- 5: Consider another three designs, choose the best one, and add both guard and warning sign



No.	Sub-clause of EN 12100: 2010	Hazards source	S	A	G	W	Level
<b>Mechanical hazards</b>							
1.1	6.2.2.1	Being run over	S2	A1	G1	W1	-
1.2	6.2.2.2	Being thrown					N/A
1.3	6.2.3 a)	Crushing	S2	A1	G1	W1	-
1.4	6.2.3 b)	Cutting or severing					N/A
1.5	6.2.6	Drawing in or trapping					N/A
1.6	6.2.10	Entanglement	S2	A1	G1	W1	-
1.7	6.3.1	Friction or abrasion					N/A
1.8	6.3.2	Impact	S2	A1	G1	W1	-
1.9	6.3.3	Injection					N/A
1.10	6.3.5.2	Shearing					N/A
1.11	6.3.5.4	Slip, trip and fall of person					N/A
1.12	6.3.5.5	Stabbing or puncture	S2	A1	G1	W1	-
1.13	6.3.5.6	Suffocation					N/A
	6.4.1						
	6.4.3 6.4.4						
<b>Electrical hazards</b>							
2.1	6.2.9	Burn					N/A
2.2		chemical effects					N/A
2.3	6.3.2	effects on medical implants					N/A
2.4	6.3.3.2	electrocution	S2	A1	G1	W1	-
2.5	6.3.5.4	falling, being thrown					N/A
2.6	6.4.4	Fire					N/A
2.7	6.4.5	projection of molten particles					N/A
2.8		Shock	S2	A1	G1	W1	-
<b>Thermal hazards</b>							
3.1	6.2.4 b)	Burn					N/A
3.2	6.2.8 c)	Dehydration;					N/A
3.3	6.3.2.7	Discomfort;					N/A
3.4	6.3.3.2.1	Frostbite;					N/A
3.5	6.3.4.5	Injuries by the radiation of heat sources					N/A
3.6		Scald					N/A
<b>Hazards generated by noise</b>							
4.1	6.2.2.2	Discomfort	S2	A1	G1	W1	-
4.2	6.2.3 c)	Loss of awareness					N/A
4.3	6.2.4 c)	Loss of balance					N/A
4.4	6.2.8 c)	Permanent hear loss					N/A
4.5	6.3.1	Stress					N/A

No.	Sub-clause of EN 12100: 2010	Hazards source	S	A	G	W	Level
4.6	6.3.2.1 b)	Tinnitus					N/A
4.7	6.3.2.5.1	Tiredness					N/A
4.8	6.3.3.2.1	Any other					N/A
	6.3.4.2	(for example, mechanical,					
	6.4.3	electrical) as a consequence of					
	6.4.5.1 b) and c)	an interference with speech communication or with acoustic signals.					
<b>Hazards generated by vibration</b>							
5.1	6.2.2.2	Discomfort					N/A
5.2	6.2.3 c)	Low-back morbidity					N/A
5.3	6.2.8 c)	Neurological disorder					N/A
5.4	6.3.3.2.1	Osteo-articular disorder					N/A
5.5	6.3.4.3	Trauma of the spine					N/A
5.6	6.4.5.1 c)	Vascular disorder					N/A
<b>Hazards generated by radiation</b>							
6.1	6.2.2.2	Burn					N/A
6.2	6.2.3 c)	Damage to eyes and skin					N/A
6.3	6.3.3.2.1	Effects on reproductive capability					N/A
6.4	6.3.4.5	Genetic mutation					N/A
	6.4.5.1 c)						
		Headache, insomnia,					
<b>Hazards generated by materials and substances processed or used by the machinery</b>							
7.1	6.2.2.2	Breathing difficulties, suffocation					N/A
7.2	6.2.3 b)	Cancer					N/A
7.3	6.2.3 c)	Corrosion					N/A
7.4	6.2.4 a)	Effects on reproductive capability					N/A
7.5	6.2.4 b)	Explosion					N/A
7.6	6.3.1	Fire					N/A
7.7	6.3.3.2.1	Infection					N/A
7.8	6.3.4.4	Mutation					N/A
7.9	6.4.5.1 c)	Poisoning					N/A
7.10	6.4.5.1 g)	Sensitization					N/A
<b>Hazards generated by neglecting ergonomic principles in machine design</b>							
8.1	6.2.2.1	Discomfort					N/A
8.2	6.2.7	Fatigue					N/A
8.3	6.2.8	Musculoskeletal disorder					N/A

No.	Sub-clause of EN 12100: 2010	Hazards source	S	A	G	W	Level
8.4	6.2.11.8	Stress					N/A
8.5	6.3.2.1 6.3.3.2.1	Any other (e.g. mechanical, electrical) as a consequence of human error	S1	A1	G1	W1	-
<b>Hazards associated with the environment in which the machine is used</b>							
9.1	6.2.6 6.2.11.11 6.3.2.1 6.4.5.1 b)	Light					N/A
9.2		Dust / fog					N/A
9.3		Water / moisture					N/A
9.4		Pollution					N/A
9.5		Temperature					N/A
9.6		Snow / ice					N/A
9.7		Wind					N/A
9.8		Lack of oxygen					N/A

This list is not fully complete compared to the list presented in EN ISO 12100:2010. Especially those hazards connected to events such as lifting and the using of mobile equipment are excluded. (1. of 2. amendment of the Machinery directive)  
Id. NO gives reference to the hazard listed in EN ISO 12100:2010.

No.	Hazards source	S	A	G	W	Level
1.1	Being run over	S2	A1	G1	W1	-
<b>Where</b>	<i>Working area</i>					
<b>When</b>	<i>The machine is maintain</i>					
<b>Improvement result</b>						
<b>Method</b>		S	A	G	W	Level
	<i>By means of adopting safety guard and warning marking. PPE is required. The guidance information provided.</i>	S1	A1	G1	W1	-
<b>No.</b>	<b>Hazards source</b>	<b>S</b>	<b>A</b>	<b>G</b>	<b>W</b>	<b>Level</b>
1.3	Crushing	S2	A1	G1	W1	-
<b>Where</b>	<i>Working area</i>					
<b>When</b>	<i>The machine is working.</i>					
<b>Improvement result</b>						
<b>Method</b>		S	A	G	W	Level
	<i>By means of adopting safety guard and warning marking. The guidance information provided.</i>	S1	A1	G1	W1	-

NOTE: "N/A" means that the hazard is not required to assess.

No.	Hazards source	S	A	G	W	Level
1.6	Entanglement	S2	A1	G1	W1	-
<b>Where</b>	<i>Working area</i>					
<b>When</b>	<i>The machine is working.</i>					
<b>Improvement result</b>						
<b>Method</b>		S	A	G	W	Level
<i>By means of adopting safety guard and warning marking</i>		S1	A1	G1	W1	-
No.	Hazards source	S	A	G	W	Level
1.8	Impact	S2	A1	G1	W1	-
<b>Where</b>	<i>Working area</i>					
<b>When</b>	<i>The machine is working.</i>					
<b>Improvement result</b>						
<b>Method</b>		S	A	G	W	Level
<i>By means of adopting safety guard and warning marking</i>		S1	A1	G1	W1	-
No.	Hazards source	S	A	G	W	Level
1.12	Stabbing or puncture	S2	A1	G1	W1	-
<b>Where</b>	<i>Working area</i>					
<b>When</b>	<i>The machine is working.</i>					
<b>Improvement result</b>						
<b>Method</b>		S	A	G	W	Level
<i>By means of adopting safety guard and warning marking</i>		S1	A1	G1	W1	-
No.	Hazards source	S	A	G	W	Level
2.4	electrocution	S2	A1	G1	W1	-
<b>Where</b>	<i>Electrical cabinet</i>					
<b>When</b>	<i>Machine working</i>					
<b>Improvement result</b>						
<b>Method</b>		S	A	G	W	Level
<i>By means of adopting safety guard and warning sign and appropriate design according to standard EN60204-1.</i>		S1	A1	G1	W1	-
No.	Hazards source	S	A	G	W	Level
2.8	Shock	S2	A1	G1	W1	-
<b>Where</b>	<i>Electrical cabinet</i>					
<b>When</b>	<i>Machine working</i>					
<b>Improvement result</b>						
<b>Method</b>		S	A	G	W	Level
<i>The fixed guards provided and If open the cabinet that needs the key or tools. Warning marks used.</i>		S1	A1	G1	W1	-
No.	Hazards source	S	A	G	W	Level

8.5	Any other (e.g. mechanical, electrical) as a consequence of human error	<b>S1</b>	<b>A1</b>	<b>G1</b>	<b>W1</b>	-
<b>Where</b>	<i>Near the machine</i>					
<b>When</b>	<i>Machine working</i>					
<b>Improvement result</b>						
	<b>Method</b>	<b>S</b>	<b>A</b>	<b>G</b>	<b>W</b>	<b>Level</b>
	<i>See the manual</i>	<b>S1</b>	<b>A1</b>	<b>G1</b>	<b>W1</b>	-

**Part III: Report**  
**3.1 EN ISO12100:2010**

6	Risk reduction		-
6.1	General		-
	<p>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:</p> <ul style="list-style-type: none"> <li>-severity of harm from the hazard under consideration</li> <li>-probability of occurrence of that harm</li> </ul> <p>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)</p>	<p>This requirement is complied with. See related clauses.</p>	Pass
6.2	Inherently safe design measures		-
6.2.1	General		-
	<p>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.</p>	<p>Appropriate machine design has been performed by the manufacturer.</p>	Pass
	<p>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.</p> <p>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).</p>	<p>Appropriate machine design has been performed by the manufacturer.</p>	Pass
6.2	Consideration of geometrical factors and physical aspects		-
6.2.2.1	Geometrical factors such factors include the following.		-
	<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</p>	<p>Appropriate machine design has been performed by the manufacturer.</p>	Pass

	<p>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"> <li>-the travelling and working area of mobile machines;</li> <li>-the zone of movement of lifted loads or of the carrier of machinery for lifting persons:</li> <li>-the area of contact of the tool of a hand-held or hand-guided machine with the material being worked.</li> </ul> <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>		
	<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>	<p>Appropriate machine design has been performed by the manufacturer.</p>	<p>Pass</p>
	<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>	<p>Appropriate machine design has been performed by the manufacturer.</p>	<p>Pass</p>
	<p>d) The form of the machine is designed so as to achieve a suitable working position and provide accessible manual controls (actuators).</p>	<p>Appropriate machine design has been performed by the manufacturer.</p>	<p>Pass</p>
6.2.2.2	<p>Physical aspects</p>		-
	<p>Such aspects include the following:</p>		-
	<p>a) limiting the actuating force to a sufficiently low value so that the actuated part does not generate a mechanical hazard;</p>	<p>The actuating force has been limited to be a sufficiently low value so that the actuated part does not generate a</p>	<p>Pass</p>

		mechanical hazard.	
	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 :		-
	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
	-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	Has been taken	Pass



	stresses ( notably cyclic stresses ) ;	into account	
	- 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		-
	One or more hazards can be eliminated or risks reduced by the choice of the technology to be used in certain applications, e. g.:		-
	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
	b)for particular products to be processed such as a solvent:equipment assuring that the		Not applicable

	temperature will remain far below the flash point.		
	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:		
	-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 of the 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		-
	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	This machine has been adjusted to the human strength and	Pass

	effort, actuation of controls and hand, arm and leg anatomy.	convenient movement.	
	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
	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		-
	- 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.		Not applicable
	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		-
	-they fit within the parameters and characteristics of human perception		Pass
	-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 form the control position		Pass
6.2.9	Preventing electrical hazard		-
	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.	-
	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:		-
	-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 of the 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,	This requirement is complied with	Pass

	if it is not possible, means are provided for their isolation, local depressurizing and pressure indication (see also ISO 14118, clause 5)		
	- 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:		-
	- 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	The design of control systems comply with the related principles	Pass

	principles and methods presented in this subclause 6.2.11 and in 6.2.12.	and methods	
	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;		-
	-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		Not applicable

	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).		
	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.		-
	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.	-
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	The type of stopping of this machine belongs to state 1and state 0.	Pass



	passage from state 1 to 0 (if state 1 represents the highest energy state).		
	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 a machine when it is re-energized after power interruption has been prevented by contactor.	-
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	-
	-the stopping function of the machinery shall remain;		-
	-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);		-
	-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.	-
6.2.11.6	Use of automatic monitoring		-
	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.	-
	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	-
	In either case, the protective measure can be initiated immediately or delayed until a specific	Appropriate automatic monitoring	-

	event occurs (e.g. the beginning of the machine cycle) The protective measures may be, e.g.:	has been used.	
	-the stopping of the hazardous process;	Emergency stop is provided	-
	-preventing the re-start of this process after the first stop following the failure;	Reset before restart is necessary	-
	-the triggering of an alarm		Not applicable
6.2.11.7	Safety functions implemented by programmable electronic control systems		-
6.2.11.7.1	General		-
	A control system including programmable electronic equipment(e.g. programmable controllers)can be used to implement safety functions machinery		-
	equipment(e.g. programmable controllers) can be used to implement safety functions machinery	safety functions are considered during design	-
	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	-
	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	-
	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	-
	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	-
6.2.11.7.2	Hardware aspects		-
	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	The hardware has been selected and installed to meet both the functional and performance	-

	of:	requirements of the safety functions to be performed	
	-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	-
	-selecting (and/or designing) equipment and devices with an appropriate probability of dangerous random hardware failure;	Appropriate devices are provided	-
	Incorporating measures and techniques within the hardware to avoid systematic failures and control systematic faults.	Appropriate devices are provided.	-
6.2.11.7.3	Software aspects		-
	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.	-
	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	Manual controls have	Pass

	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.	been located out of reach of the danger zones.	
	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,	This requirement is complied with.	Pass

	e.g. by the design and location of control devices.		
	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
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		Not applicable

	with a mode selector which can be locked in each position.		
	Each position of the selector shall be clearly identifiable and shall exclusively allow one control or operating mode.		Not applicable
	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		-
	“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 6.213	Reliable components have been used	-
6.2.12.3	Use of“oriented failure mode”components		-
	“Oriented failure mode”components or systems are those in which the predominant failure mode		Not applicable

	is known in advance and which can be used so that such a failure leads to a non-hazardous alteration of the machine function		
	The use of such components should always be considered particularly in cases where redundancy is (see 6.2.12.4)not employed		Not applicable
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 equipment		-
	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.	-
	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.	-
	Safety-critical components (as e.g. certain sensors) with known reliability shall be used.	Safety-critical components are used in this machine.	-
	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.	-
6.2.14	Limiting exposure to hazards through mechanization or automation of loading(feeding) /unloading (removal) operations		-

	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.	-
	Automation can be achieved e.g. by robots, handling devices. transfer mechanisms, air blast equipment.	This requirement has been complied with by design.	-
	Mechanization can be achieved, e.g. by feeding slides, push rods, hand-operated indexing tables.	This requirement has been complied with by design.	-
	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.	-
	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	-
	Suitable safeguards (see 6.3) shall be provided if this cannot be ensured.	Please see the related clause	-
	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	-
6.2.15	Limiting exposure to hazards through location of the setting and maintenance points outside of danger zones.		-
	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	Appropriate guards and protective devices have been used to protect persons whenever inherently	Pass



	additional equipment (e.g. emergency stop equipment )may have to be implemented.	safe design does not reasonably make it possible either inherently safe either to remove hazards or to sufficiently reduce risks.	
	The different kinds of guards and protective devices are defined in 3.27 and 3.28.	Please see the related clause	Pass
	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 assess to the primary hazard zone, a trip device may be		Not applicable

	requiring hazard between the secondary drawing-in or shearing hazard between the mechanical loading(feeding) device, when reachable, and the fixed guard.		
	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
	- 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		-
	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		-
	Where access to the hazard zone is required during normal operation of the machinery , safeguards should be selected from the following:		-
	a)interlocking guard with or without guard locking (see also ISO 14119, ISO 14120 and 6.3.3.2.3 of		Not applicable

	this standard);		
	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.		-
	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		-
6.3.2.5.1	Selection		-
	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.		Not applicable
	The following provisions are intended to provide the designer with criteria for selecting , for each application, the most suitable device(s).		Not applicable
	Types of sensitive protective equipment include, e.g.:		-
	- light curtains;		Not applicable
	- scanning devices as, e.g. laser scanners;		Not applicable
	- pressure sensitive mats;		Not applicable
	- trip bars, trip wires.		Not applicable
	Sensitive protective equipment can be used:		-
	- for tripping purposes;		Not applicable
	- for presence sensing;		Not applicable
	- for both tripping and presence sensing		Not applicable
	- to re-initiate machine operation, a practice which is subject to stringent conditions.		Not applicable
	The following characteristics of the machinery, among others, can preclude the sole use of sensitive protective equipment:		Not applicable

	- tendency for the machinery to eject materials or component parts;		Not applicable
	- necessity to guard against emissions (noise, radiation, dust, etc.)		Not applicable
	- erratic or excessive machine stopping time;		Not applicable
	-inability of a machine to stop part-way through a cycle.		Not applicable
6.3.2.5.2	Implementation		-
	consideration should be given to :		-
	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		Not applicable

	person or part of a person from entering the hazard zone ,or being present in it , without being detected .		
6.3.2.5.3	Additional requirements for sensitive protective equipment when used for cycle initiation .		-
	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		Not applicable

	conditions.		
6.3.2.6	Protective measures for stability		-
	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 form operation other than		Not applicable
	those controlled by the operator;		-
	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		Not applicable

	operator at the control position;		
	- 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
	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;		-
	- 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;		Not applicable
	They shall:		-
	-be designed so that the adjustment remains fixed during a given operation		Not applicable
	-be readily adjustable without the use of tools;		Not applicable
6.3.3.2.5	Requirements for interlocking guards with a start function (control guards)		Not applicable
	An interlocking guard with a start function may be used provided that		Not applicable
	- all requirements for interlocking guards are satisfied (see ISO 14119)		Not applicable
	- the cycle time of the machine is short		Not applicable
	-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 tart function and resetting is necessary before restarting the machine.		Not applicable
	- 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)		Not applicable
	- all other guards whether fixed (removable		Not applicable

	type) or movable are interlocking guards;		
	-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;		Not applicable
	-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;		Not applicable
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.	-
	- 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.	-
6.3.3.3	Technical characteristics of protective devices		-
	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.	-
	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.	-
	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.	-
6.3.3.4	Provisions for alternative types of safeguards.	-	-
	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.		Not applicable
6.3.4	Safeguarding for reducing emissions		-
6.3.4.1	General		-

	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		-
	Additional protective measures include, for example:		-
	-encapsulation of the machine (enclosure with negative pressure);		Not applicable
	- local exhaust ventilation with filtration.		Not applicable
	- wetting with liquids;		Not applicable
	- special ventilation in the area of the machine (air curtains , cabins for operators)		Not applicable
6.3.4.5	Radiation		-
	Additional protective measures include, for example:		-
	- use of filtering and absorption;		Not applicable
	- use of attenuating screens or guards		Not applicable
6.3.5	Complementary protective measures		-
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		-

	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 topped 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 rest.	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-		-
	Measures for the escape and rescue of trapped persons may consist e.g. of:		-
	-escape routes and shelters in installations generating operator-trapping hazards		Not applicable
	-arrangements for moving some elements by hand, after an emergency stop		Not applicable
	-arrangements for reversing the movement of some elements		Not applicable
	- anchorage points for descender devices;		Not applicable
	-means of communication to enable trapped operators to call for help		Not applicable

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
	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	These requirements	Pass

	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.	have been taken into account during design.	
	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.		Not applicable
	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 ISO 14122-3) shall be provided.		Not applicable
	In large automated installations, particular attention shall be given to safe means of access such as walkways, conveyor bridges or crossover points.		Not applicable
	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)		Not applicable
	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)		Not applicable
	Openings shall whenever possible open towards a safe position, they shall be designed to prevent hazards due to unintended opening.		Not applicable
	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.		Not applicable
	When machinery for lifting goods and/or persons includes landings at fixed levels, these shall be equipped with interlocking guards preventing falls when the platform is not present at the level.		Not applicable
	Movement of the lifting platform shall be prevented while the guards are open.		Not applicable
	For detailed provisions see ISO 14122.		Not applicable
	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
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
	- 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
	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 the 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
	-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
	- 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,	All the related information is stated in the instruction handbook	Pass

	<p>and about specific safeguards which are necessary for such applications.</p> <ul style="list-style-type: none"> <li>-reasonably foreseeable misuse and prohibited usages;</li> <li>- fault identification and location , repair, and re-starting after an intervention;</li> <li>- personal protective equipment which need to be used and training required.</li> </ul>		
	e) information for maintenance e.g.	All the related information is stated in the instruction handbook	Pass
	<ul style="list-style-type: none"> <li>-nature and frequency of inspections for safety functions;</li> <li>-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)</li> <li>- 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)</li> <li>-drawings and diagrams enabling maintenance personnel to carry out their task rationally (especially fault-finding tasks)</li> </ul> <p>f) information relating to de-commissioning , dismantling and disposal;</p> <p>g) information for emergency situations , e.g. :</p> <ul style="list-style-type: none"> <li>- type of fire-fighting equipment to be used.</li> <li>- warning about possible emission or leakage of harmful substance(s), and if possible, indication of means to fight their effects.</li> </ul>	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
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	All the related information is stated in	Pass

	colours, symbols and/or large print.	the instruction handbook	
	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
	c) information for use shall be as simple and as brief as possible, and should be	All the related information is stated in	Pass

	expressed in consistent terms and units with a clear explanation of unusual technical terms.	the instruction handbook	
	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		-
	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
	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	See the risk	Pass

	protective measures;	assessment report in detail.	
	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

# Annex

## Photo of product





## Nameplate

**Excavator Bucket**

Model(s): HTGPB-1



Manufacturer: NINGBO KEPO ELECTRONICS CO.,LTD

Address: No.1 Qiangang Street, Jinpen Industrial Park,  
Baiyun District, Guangzhou, Guangdong, China

# Notice

1. This evaluation report is for samples only.
2. This evaluation report has assessed the basic requirements of the sample according to relevant standards.
3. This evaluation report is invalid without authorized signature.
4. This assessment report shall not be altered or deleted,
5. This assessment report shall not be used as a forensic expertise.
6. This assessment report is internal data and does not have the ability of public disclosure.
7. Client shall put forward demurrer within 15days after received report. laboratory shall refuse disposal if exceeded the time limit.
8. The assessment results presented in this report relate only to the object assessment.