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## TEST REPORT EN 60204-1

## Safety of machinery - Electrical equipment of machines Part 1: General requirements

Report reference No...... HS202412259129-1ER

Testing Laboratory...... Shenzhen Huasheng Testing Technology Co., Ltd.

Room1004, NO.8, Chongqing Road, Qiaotou Community, Fuhai

Street, Bao'an District, Shenzhen, Guangdong, China

Applicant's name...... Fonland (Wuhan) Optoelectronics Technology Co., Ltd.

Address...... Room 04-40, 3rd Floor, Building 3, Gezhouba Sun City, No. 40,

Gaoxin 4th Road, Fozuling Street, Donghu New Technology Development Zone, Wuhan City, Hubei Province (Wuhan Area of

Free Trade Zone)

Test specification:

Standard.....: EN ISO 12100:2010

EN 60204-1:2018

Test procedure....: CE-MD

Non-standard test method...... N/A

Test Report Form No...... IEC60204\_1A

Test Report Form(s) Originator.....: Electrosuisse

Master TRF...... Dated 2009-11

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Test item description...... laser cutting machine

Trade Mark.....

RUBY

Manufacturer...... Fonland (Wuhan) Optoelectronics Technology Co., Ltd.

Gaoxin 4th Road, Fozuling Street, Donghu New Technology Development Zone, Wuhan City, Hubei Province (Wuhan Area of

Free Trade Zone)

Model/Type reference.....: RUBY

RUBY3020,RUBY4040,RUBY4060,RUBY6090,RUBY1390, RUBY7050,RUBY1080,RUBY1310,RUBY1325,RUBY1410, RUBY1610,RUBY1810,RUBY1515,RUBY1520,RUBY1530

: Input:AC 220V,15A,50Hz

Output:AC 220V,10A,2200W



Responsible Testing Laboratory (as applicab	le), testing procedure and testing location(s):
☐ Testing Laboratory:	Shenzhen Huasheng Test Technology Co., Ltd.
Testing location/ address:	Room1004, NO.8, Chongqing Road, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Associated Testing Laboratory:	
Testing location/ address:	
Tested by (name, function, signature):	Rock Ren Rock Ren HSTC:
Approved by (name, function, signature):	Snow Wu Sww W
☐ Testing procedure: TMP/CTF Stage 1:	
Testing location/ address:	
Tested by (name, function, signature):	
Approved by (name, function, signature):	
Testing procedure: WMT/CTF Stage 2:	
Testing location/ address:	
Tested by (name + signature):	
Witnessed by (name, function, signature):	
Approved by (name, function, signature):	
Testing procedure: SMT/CTF Stage 3 or 4:	
Testing location/ address:	
Tested by (name, function, signature):	
Witnessed by (name, function, signature):	
Approved by (name, function, signature):	
Supervised by (name, function, signature) :	



Copy of marking plate

laser cutting machine Model:RUBY Input:Input:AC 220V,15A,50Hz Output:AC 220V,10A,2200W





Fonland (Wuhan) Optoelectronics Technology Co., Ltd. Room 04-40, 3rd Floor, Building 3, Gezhouba Sun City, No. 40, Gaoxin 4th Road, Fozuling Street, Donghu New Technology Development Zone, Wuhan City, Hubei Province (Wuhan Area of Free Trade Zone)

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Test item particulars:	
Classification of installation and use	laser cutting machine
Supply Connection:	
Possible test case verdicts:	
- test case does not apply to the test object:	N/A
- test object does meet the requirement:	P/ 4/ 1/ 1/ 1/ 4/
- test object does not meet the requirement:	Fail
General remarks:	
"(See Enclosure #)" refers to additional information apple (See appended table)" refers to a table appended to the Throughout this report a comma (point) is used as the - Determination of the test result includes consideration and methods;  - The related applicable OSM decisions have been consideration:	decimal separator. of measurement uncertainty from the test equipment
N/A	



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Clause	Requirement - Test	Result - Remark	Verdict
4 *************************************	GENERAL REQUIREMENTS		e P
4.1	General	print September 19	8 P
Service Service	Hazards relevant to the electrical equipment are assessed as part of the overall risk assessment of the machine.		P
4.2	Selection of equipment	State of Sta	Server P.
4.2.1	Electrical components/devices suitable for their intended use and applied in accordance with supplier's instructions.		P
4.2.2	Where possible electrical equipment in compliance with the IEC 60439 series.		N/A
4.3	Electrical supply	and the state of t	, and P
4.3.1	Electrical equipment to be designed for correct operation within the conditions of mains power supply - as stated below (cl. 4.3.2 or 4.3.3)		P
S Harden S Harden Line	or as stated by the user (record specs in this TR)		N/A
graditi Statement	or as stated by the supplier <sup>1</sup>		N/A
4.3.2	AC supplies	and the state of t	B and the state of
grande tri Saraha	Supply Voltage: Steady state voltage: 0,9 1,1 of nominal voltage		P
s and the state of	Frequency: 0,99 1,01 of nominal frequency continuously; 0,98 1,02 short time.		P
	Harmonics: not exceeding 10 % of the total r.m.s. etc.		P
S British	Voltage unbalance: not exceeding 2% deviation.		P. S.
	Voltage interruption: interrupted or at zero voltage for not more than 3 ms at any random time in the supply cycle with more than 1 s between successive interruptions.		P
Supposition S	Voltage dips not exceeding 20 % of the peak voltage of the supply for more than one cycle with more than 1 s between successive dips.		P
4.3.3	DC supplies	/ 6 / 6 /	N/A
September 1	Supply Voltage: - other:0,85 to 1,15 of nominal voltage; - battery-operated vehicles: 0,7 to 1,2 of nom. volt from converting equipment: 0,9 to 1,1 of nom. volt.		N/A
Suppose the	Voltage interruption: - other: not exceeding 5 ms - converting equipment: not exceeding 20 ms		N/A



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Clause	Requirement - Test	Result - Remark	Verdict
S Production	Dipple (peek to peek) not exceed 0.15 of non-yelt		N/A
	Ripple (peak-to-peak): not exceed. 0,15 of nom. volt.	and the second second	N/A
4.3.4	Special supply systems; e.g. on board generators limits acc. 4.3.2 /.3 exceeded, but equipment designed acc. exceeded limits.		N/A
4.4	Physical environment and operating conditions	and the state of t	. The second of
4.4.1	Electrical equipment suitable for the physical environment and operating conditions of its intended use.		P
4.4.2	Electromagnetic compatibility (EMC): Equipment shall not generate electromagnetic disturbances above levels that are appropriate for its intended operating environment and shall have a level of immunity to electromagnetic disturbances so that it can function in its intended environment (IEC 61000-6-1 or IEC 61000-6-2 and CISPR 61000-6-3 or IEC 61000-6-4 give general EMC emission and immunity limits.)		P
	Are there sufficient measures to limit the generation of electromagnetic disturbances, i.e. conducted and radiated provided? (E.g. power supply filtering; cable shielding; enclosures designed to minimize RF radiation; RF suppression techniques; design of functional bonding system, using conductors with low RF impedance and as short as practicable.		
4.4.3	Electrical equipment shall be capable of operating correctly in the intended ambient air temperature. (Minimum requirement: air temperatures of +5 °C and +40 °C)		P
4.4.4	Electrical equipment shall be capable of operating correctly when the relative humidity is up to 50 % at a maximum temperature of +40 °C		P
4.4.5	Electrical equipment shall be capable of operating correctly at altitudes up to 1 000 m above mean sea level.		P
4.4.6	Electrical equipment shall be adequately protected against the ingress of solids and liquids (see 11.3)		P P
4.4.7	Electrical equipment shall withstand ionizing and non-ionizing radiation.		6P
4.4.8	Electrical equipment shall withstand vibration, shock and bump.		P .
4.5	Electrical equipment designed to withstand the effects of transportation and storage within a temperature range of - 25 to + 55 °C.		P
4.6	Heavy or bulky electrical equipment of the machine provided with suitable means for handling.		N/A



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Clause	Requirement - Test	Result - Remark	Verdict
S. Marketei			S. Harden
4.7	Electrical equipment is installed and operated in accordance with the supplier's instruction.		ares Pi

5 8 10 10	INCOMING SUPPLY CONDUCTOR TERMINATIONS AND DEVICES FOR DISCONNECTING AND SWITCHING OFF	
5.1	Incoming supply conductor terminal	
5.1	Electrical equipment of a machine connected to one single power supply (For large complex machinery comprising a number of widely-spaced machines working together in a coordinated manner, there can be a need for more than one incoming supply depending upon the site supply arrangements)	P
gartri Springer	Power supply conductors terminated to main disconnecting device of electrical equipment (unless a plug is provided for disconnection)	P
S. W. Street, Co.	Neutral conductor clearly indicated in technical documentation with "N" (see cl. 16.1)	P,
	No connection between neutral conductor and protective bonding circuit nor combined PENterminals.  Exception: a connection may be made between the neutral terminal and the PE terminal at the point of the connection of the power supply to the machine for TN-C systems.	P
a paragraphic first	All terminals of incoming supply clearly marked in ac. with cl. 16.1 (symbols acc. to EN 60445)	P
5.2	Terminal for connection to external protective earthing system	
	For each incoming supply, a terminal shall be provided in the vicinity of the associated phase conductor terminals for connection of the machine to the external protective earthing system or to the external protective conductor, depending upon the supply distribution system.	P
Sandard Sandard	Cross section of incoming PE conductor acc. to cl. 5.2, table 1.  (Where an external protective conductor of a material other than copper is used, the terminal size shall be selected accordingly. See also 8.2.2).	P
Salar Contraction of the Contrac	Protective earth identified either by graphic symbol, letters "PE", or bicolour combination GREEN / YELLOW	P
5.3	Supply disconnecting device	P ,



Page 8 of 92 Report No.: HS202412259129-1ER EN 60204-1 Clause Requirement - Test Result - Remark Verdict 5.3.1 A supply disconnecting device shall be provided: Ρ - for each incoming source of supply to a machine for each on-board power supply. 5.3.2 Type of power supply disconnecting device: a) Switch-disconnector, acc. to EN 60947-3 for N/A appliance category AC-23 B or DC-23 B b) Disconnector with or without fuses, with aux. N/A contact (acc. to EN 60947-3 c) Power circuit breaker suitable for isolation N/A (acc. to EN 60947-2) d) any other switching device in accordance with an IEC product standard for that device and which meets the isolation requirements of IEC 60947-1as well as a utilization category e) Plug/socket combination for electrical load N/A (requirements see cl. 5.3.3) 5.3.3 Disconnection device has to fulfil all of the following requirements - isolate the electrical equipment from the supply and Ρ have only one OFF (isolated) and only one ON position marked with "O" and "I" - visible contact gap or a position indicator which cannot indicate OFF (isolated) until all contacts are actually open and the requirements for the isolating function have been satisfied Р - have an external operating means e.g.a handle (except power operated CB's) - coloured black or grey recommended P (If used as an emergency stop, red/yellow combination selected) Ρ be provided with a means permitting it to be locked in the OFF position (padlocks). When so locked, remote as well as local closing shall be prevented N/A - disconnect all live conductors of its power supply circuit (For TN supply systems, the neutral conductor may or may not be disconnected except in countries where disconnection of the neutral conductor (when used) is compulsory.) Requirements for plug/socket combination as a N/A disconnection device: - Breaking capacity of the plug/socket combination: sufficient to interrupt the current of the largest motor

when stalled together with the sum of the normal running currents of all other motors and/or loads.

further see. cl. 13.4.5 a) to f)



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Clause	Requirement - Test	Result - Remark	Verdict
S' CHARLETT			Martine i
5.3.4	The operating means are easily accessible and located between 0,6 m and 1,9 m above the servicing level.		P production of the second
5.3.5	Only the following circuits need not be disconnected by the supply disconnecting device:  - lighting circuits for lighting needed during maintenance or repair;  - plug and socket outlets for the exclusive connection of repair or maintenance tools and equipment;  - under voltage protection circuits that are only provided for automatic tripping in the event of supply failure;  - circuits supplying equipment that should normally remain energized for correct operation  - control circuits for interlocking  Such circuits are provided with their own disconnecting device.		P
	Circuits not disconnected by the supply disconnecting device have: - permanent warning labels in accordance with cl. 16.1		N/A
ger agestiti	- a statement is included in the maintenance manual	plant self plants and plants	N/A
	<ul> <li>- additionally one or more of the following is applied;</li> <li>- a permanent warning label in accordance with 16.1 is affixed in proximity to each excepted circuit, or</li> <li>- the circuit is separated from other circuits, or</li> <li>- the conductors are identified by colour taking into account the recommendation of Cl.13.2.4.</li> </ul>		N/A
5.4	Disconnecting devices to prevent of unexpected start-	up:	_
	- Devices for the prevention of unexpected start-up are provided These devices are appropriate and convenient for the intended use, are suitably placed, and readily identifiable as to their function and purpose (for example by a durable marking in accordance with cl. 16.1).		P
Sand Sandard	Means are provided to prevent inadvertent and/or mistaken closure of these devices either at the controller or from other locations		P,
	- Devices that do not fulfil the isolation function (e.g. a contactor switched off by a control circuit) are only used for situations that include:  - inspections;  - adjustments;  - no hazardous work on the electrical equipment (for example replacement of plug-in devices without disturbing existing wiring)		P



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Clause	Requirement - Test	Result - Remark	Verdict	
5.5	Devices for disconnecting electrical equipment		September 1	
	- Requirements to devices for disconnecting electrical equipment to enable work to be carried out when it is de-energised and isolated:  - appropriate and convenient for the intended use;  - suitably placed;  - readily identifiable as to which part or circuit of the equipment is served (for example by durable marking in accordance with 16.1 where necessary).  - Additional means are provided to prevent of inadvertent and/or mistaken closure of these devices either at the controller or from other locations		P	
	<ul> <li>Where it is necessary to work on individual parts of the electrical equipment of a machine, or on one of a number of machines fed by a common conductor bar, conductor wire or inductive power supply system, a disconnecting device is provided for each part, or for each machine, requiring separate isolation.</li> <li>In addition to the mentioned supply disconnecting device, the following devices that fulfil the isolation function may be provided for this purpose: <ul> <li>devices described in 5.3.2;</li> <li>disconnectors, withdrawable fuse links and withdrawable links only if located in an electrical operating area (see 3.15) and relevant information is provided with the electrical equipment (see 17.2 b)9) and b)12)).</li> </ul> </li> </ul>		P	
5.6	Protection against unauthorized, inadvertent and/or m	istaken connection	- 6 -	
Senter Sent	For devices acc. to cl. 5.4(disconnecting electrical equipment) and 5.5 (prevention of unexpected start-up) locking means in OFF position are provided and no remote reconnection is possible.		N/A	
	Where a non-lockable disconnecting device is provided (for example withdrawable fuse-links, withdrawable links), other means of protection against unintended energising are used.		N/A	
Sent Sent Sent Sent Sent Sent Sent Sent	Where plug/socket combinations according to 5.3.2 e) are used for the purpose of prevention of unexpected start-up the are so positioned that they can be kept under the immediate supervision of the person carrying out the work.		N/A	

6 g	PROTECTION AGAINST ELECTRIC SHOCK	P
6.2.2	Protection against direct contact	



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ald Quantum	EN 60204-1				
Clause	Requirement - Test	Result - Remark	Verdict		
			S. Harden S.		
	Live parts that are located inside enclosures have to bee conform to the relevant requirements of Clauses 4, 11, and 14 and have to have a protection against direct contact of at least IP2X or IPXXB.		P <sub>1</sub>		
September 1	Where the top surfaces of the enclosure are readily accessible, the minimum degree of protection against direct contact provided by the top surfaces shall be IP4X or IPXXD.		P		
6.2.2 a	Opening an enclosure (i.e. opening doors, lids, covers, and the like) is possible only when:  a) Either the use of a key or tool is necessary for access and:  - all live parts, that are likely to be touched when resetting or adjusting devices intended for such operations while the equipment is still connected are protected against direct contact to at least IP2X or		P		

- live parts on the inside of doors are protected against direct contact to at least IP1X or IPXXA.

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Clause	Requirement - Test	Result - Remark Verdict
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Clause	Requirement - Test	Result - Remark	Verdict
6.2.2 b	b) Or the opening of an enclosure (i.e. opening doors, lids, covers, and the like) is possible only if disconnection is provided for all live parts inside the enclosure before it can be opened.		N/A
	Exception: If a special device or tool (intended for use only by skilled or instructed persons) as prescribed by the supplier is provided that can be used to defeat the interlock and that intends that:  - it is possible at all times while the interlock is defeated to open the disconnecting device and lock the disconnecting device in the OFF position or otherwise prevent unauthorised closure of the disconnecting device;  - upon closing the door, the interlock is automatically restored  - all live parts, that are likely to be touched when		
	resetting or adjusting devices intended for such operations while the equipment is still connected are protected against direct contact to at least IP2X or IPXXB		Sand Sand
	<ul> <li>live parts on the inside of doors shall be protected against direct contact to at least IP1X or IPXXA</li> <li>relevant information is provided with the electrical equipment like instructions on the procedures for securing the machine for safe maintenance and information on the residual risks.</li> <li>means are provided to restrict access to live parts behind doors not directly interlocked with the disconnecting means to skilled or instructed persons.</li> </ul>		
	- parts still alive after switching off are protected at least IP 2X or IP XXB and marked with a warning sign in accordance with 16.2.1  Excepted from this marking are: - parts that can be live only because of connection to interlocking circuits and that are distinguished by colour as potentially live in accordance with 13.2.4 - the supply terminals of the supply disconnecting device when the latter is mounted alone in a separate enclosure.		
6.2.2 c	c) Or the opening without the use of a key or a tool and without disconnection of live parts shall be possible only when all live parts are protected against direct contact to at least IP2X or IPXXB.  Where barriers provide this protection, either they shall require a tool for their removal or all live parts protected by them shall be automatically disconnected when the barrier is removed.		N/A
6.2.3	Protection by insulation of live parts:	ge <sup>rti</sup> S <sup>ee</sup> iti ge <sup>gerti</sup> i si	



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Clause	Requirement - Test	Result - Remark	Verdict
	Live parts are completely covered with insulation that can only be removed by destruction and that is capable of withstanding the mechanical, chemical, electrical, and thermal stresses to which it can be subjected under normal operating conditions.		P
Suppose to Suppose to the Suppose to	Paint, varnish lacquer etc. not used as the unique insulation layer.		P 8 d
6.2.4	Protection against residual voltages	gett gett gett gett	Suppose -
	Live parts with residual voltage greater than 60 V after a time period of 5 s after disconnection of the supply shall be discharged until this interferes with the proper functioning of the equipment.  Except are components with charges of ≤ 60 µC (→ equivalent to capacitor with less then 1µF @ 60V).		/ N/A
e de la companya de l	Where pins of plugs or similar devices after withdrawal are exposed, discharge time is ≤ 1s. Otherwise such conductors are protected against direct contact to at least IP2X or IPXXB.		N/A
gett Spreed	If above requirements cannot be achieved, additional disconnecting devices or appropriate warning devices shall be applied (e.g. warning acc. cl. 16.1).		N/A
6.2.5	For protection by barriers, 412.2 of IEC 60364-4-41 is applied.		N/A
6.2.6	For protection by placing out of reach, 412.4 of IEC 60364-4-41 shall apply. For protection by obstacles, 412.3 of IEC 60364-4-41 is applied.		N/A
6.3	Protection against indirect contact		P set
6.3.2	Prevention of the occurrence of a touch voltage		
6.3.2.2	Protection by provision of: - class II electrical devices or apparatus (double insulation, reinforced insulation or by equivalent insulation in accordance with IEC 61140) or - switchgear and control gear assemblies having total insulation in accordance with IEC 60439-1or - supplementary or reinforced insulation in accordance with 413.2 of IEC 60364-4-41.		P
6.3.2.3	Protection by electrical separation. For this type of protection, the requirements of 413.5 of IEC 60364-4-41 apply.		P',//
6.3.3	Protection by automatic disconnection of supply.		State of the state



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Clause	Requirement - Test	Result - Remark	Verdict
6.3.3 a)	Use of overcurrent protective device for automatic cut-off in the event of an insulation failure in a TN-System.  Where disconnection within the time specified in Clause A.1 cannot be assured, supplementary bonding is provided as necessary to meet the requirements of Clause A.3.		P
6.3.3 b)	Use of residual current protective devices (RCD) for automatic cut-off in the event of an insulation failure in a TN - or TT -System.		N/A
6.3.3 c)	Use of earth fault detection device to initiate automatic disconnection in a IT-System.	1,1,61,6	N/A
6.4	Protection by the use of PELV		N/A
6.4.1 a)	PELV circuits shall satisfy all of the following conditions: -the nominal voltage does not exceed: • 25 V a.c. r.m.s. or 60 V ripple-free d.c. when the equipment is normally used in dry locations and when large area contact of live parts with the human body is not expected; or • 6 V a.c. r.m.s. or 15 V ripple-free d.c. in all other cases;		N/A
6.4.1 b)	one side of the circuit or one point of the source of the supply of that circuit is connected to the protective bonding circuit;		N/A
6.4.1 c)	live parts of PELV circuits is electrically separated from other live circuits		N/A
6.4.1 d)	Conductors of each PELV circuit are physically separated from those of any other circuit.  If this requirement is impracticable, the insulation provisions of 13.1.3 are fulfilled;		N/A
6.4.1 e)	plugs and socket-outlets for a PELV circuit are conform to the following:  1) plugs do not to enter socket-outlets of other voltage systems;  2) socket-outlets do not admit plugs of other voltage systems.		N/A
6.4.2	Sources for PELV	State of the state	Sympholis —
	The source for PELV shall be one of the following: - safety isolating transformer in accordance with IEC 61558-1 and IEC 61558-2-6 or - a source of current with a degree of safety equivalent to that of the safety isolating transformer or - an source independent of circuit with higher voltage - electronic power supply conforming to appropriate standards		N/A



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Clause	Requirement - Test	Result - Remark	Verdict
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6.1	Other measures from IEC 60364-4-41 are used. (Description!)		N/A

7.	PROTECTION OF EQUIPMENT	P
7.2.	Overcurrent protection Unless otherwise specified by the user, the supplier of the electrical equipment is not responsible for providing the overcurrent protective device for the supply conductors to the electrical equipment (see Annex B).	P set
7.2.2.	On the installation diagram data necessary for selecting the overcurrent protective device are stated for each incoming feeder. (see 7.2.10 and 17.4)	P S
7.2.3	Power circuits:	_
	Devices for detection and interruption of overcurrent, selected in accordance with 7.2.10, are applied to each live conductor.  And, none of the following conductors, as applicable, is disconnected without disconnecting all associated live conductors:  — the neutral conductor of a.c. power circuits; — the earthed conductor of d.c. power circuits; — d.c. power conductors bonded to exposed conductive parts of mobile machines.	P
	Cross section area of neutral conductor is at least equal to the phase conductor. No overcurrent protective/ disconnecting device is required.  (For a neutral conductor with a cross sectional area smaller than that of the associated phase conductors, the measures detailed in 524 of IEC 60364-5-52 shall apply.)	P
s Special S	IT-Systems:, no neutral conductor is used. Or, when it is used, the measures detailed in 431.2.2 of IEC 60364-4-43 are applied.	N/A
7.2.4	Control circuits	_
S of the state of	Conductors of control circuits directly connected to the supply voltage and of circuits supplying control circuit transformers are protected against overcurrent in accordance with 7.2.3.	and the second
State of the state	Conductors of control circuits supplied by a control circuit transformer or d.c. supply: see 9.4.3.1	_
7.2.5	Socket outlets and their associated conductors	_
general S	Overcurrent protection is provided for the circuits feeding the general purpose socket.	N/A
7.2.6	Lighting circuits	



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Clause	Paguiroment Tost	Result - Remark	Vardist
Ciause	Requirement - Test	Result - Remark	Verdict
g the Supple of	Lighting circuits are protected separate from other circuits.		N/A
7.2.7	Transformers	and the state of t	Standard of
	Transformers are protected in accordance with the manufacturer's instructions and includes: - avoiding tripping due to transformer magnetizing inrush currents - avoiding a winding temperature rise in excess of the permitted value for the insulation class when there is a short circuit at the secondary terminals type and setting of the overcurrent protective device in accordance with the recommendations of the transformer supplier.		N/A
7.2.8	Location of overcurrent protective devices:		<sub>ppe</sub> der 8 —
e de la companya de l	- located at the point where a reduction in the cross sectional area of the conductors or another change reduces the current-carrying capacity of the conductors.		P
	Exceptions: - current carrying capacity of the conductors is at least equal to that of the load and - conductors between the point of reduction of current-carrying capacity and the position of the overcurrent protective device is ≤ 3 m and - the conductor is protected e.g. by an enclosure or duct.		P
7.2.9	Selection of overcurrent protective devices	and the second second	. s <sup>f</sup> /
	The rated short-circuit breaking capacity Icn is at least equal to the prospective fault current at the point of installation.  Additional currents other than from the supply (e.g. from motors, from power factor correction capacitors) shall be taken into consideration.		P
	Reduced breaking capacity is permitted, where another protective device is installed at supply side with the necessary breaking capacity. (In that case, the characteristics of the two devices shall be co-ordinated so that the let-through energy (I²t) of the two devices in series does not exceed that which can be withstood without damage to the overcurrent protective device on the load side and to the conductors protected by that device. See Annex A of IEC 60947-2).		P
and and	Where fuses are provided as overcurrent protective devices, a type readily available in the country of use shall be selected, or arrangements shall be made for the supply of spare parts.		P



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Clause	Requirement - Test	Result - Remark	Verdict	
7.2.10	Rating and setting of overcurrent protective devices:		Supplied Supplied :	
Sandarderichi S	Rated current of fuses or overcurrent setting of other protective devices selected as low as possible, but adequate for anticipated overcurrents.		P	
	The rated current of overcurrent protective device is determined by the current carrying capacity of the conductors to be protected in accordance with Cl. 12.4, D.2 and the maximum allowable interrupting time <i>t</i> in accordance with Clause D.3, taking into account the needs of coordination with other electrical devices in the protected circuit.		P	
7.3	Protection of motors against overheating	and the second of the second of	S <sup>tr</sup> P <sup>2</sup>	
7.3.1	Overload protection for all motors provided for ratings of > 0.5 kW in continuous operation.		P	
e de la companya de l	Protective device may be omitted for motors, which cannot be overloaded.		Service Ps	
	Exceptions: In applications where an automatic interruption of the motor operation is unacceptable (for example fire pumps), the means of detection shall give a warning signal to which the operator can respond.		N/A	
7.3.2	Protection achieved by overload protection device:		P	
S Superior Superior	For special duty motors, appropriate protective devices are recommended		N/A	
7.3.3	Protection achieved by over-temperature protection device: Is recommended in situations where the cooling can be impaired (for example dusty environments)		N/A	
7.3.4	Protection achieved by current limiting protection: Where protection against the effects of overheating in three phase motors is achieved by current limitation, the number of current limitation devices may be reduced from 3 to 2.		N/A	
7.4	Abnormal temperature protection:  Resistance heating or other circuits that are capable of attaining or causing abnormal temperatures and can cause a hazardous situation are provided with suitable detection to initiate an appropriate control response.		N/A	



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Clause	Requirement - Test	Result - Remark	Verdict		
S. Martin		s per per per per se de la companya	otti Shihing		
7.5	Protection against supply interruption or voltage reduction and subsequent restoration:  Where a supply interruption or a voltage reduction can cause a hazardous situation, damage to the machine, or to the work in progress, undervoltage		N/A		
er .	protection is provided.	and the second s	and the State of t		
	Upon restoration of supply voltage, automatic or unexpected restarting of machine prevented.		Supplied Sup		
and the state of t	Undervoltage protection does initiate appropriate control responses to ensure necessary coordination of groups of machines working together		N/A		
7.6	Motor overspeed protection: Overspeed protection is provided where overspeeding can occur and could possibly cause a hazardous situation.		P		
7.8	Phase sequence protection: Where an incorrect phase sequence of the supply voltage can cause a hazardous situation or damage to the machine, protection shall be provided.		N/A		
7.9	Protection against overvoltage due to lightning and to switching surges: - Devices are connected to the incoming terminals of the supply disconnecting device.		N/A		

8	EQUIPOTENTIAL BONDING	S. P. State of the Control of the Co	· P partir
8.2	Protective bonding circuit	patiti Suran	P ment
8.2.1	Where the conductance of structural parts of the electrical equipment or of the machine is less than that of the smallest protective conductor connected to the exposed conductive parts, a supplementary bonding conductor is provided.	Santa	P of of
getti getti	In IT distribution systems, the machine structure is part of the protective bonding circuit and insulation monitoring is provided.	Support of	N/A
	Exposed conductive parts of equipment in accordance with 6.3.2.3 (Protection by electrical separation) are not connected to the protective bonding circuit.  (For this type of protection, the requirements of 413.5 of IEC 60364-4-41 apply.)	Sandard Sandard	N/A
8.2.2	Protective conductors	ē 9°	_
State of the state	Protective conductors shall be identified in accordance with 13.2.2.	S Water to	° P
	Copper conductors are preferred.	S Harden	F 20 10 10 10 10 10 10 10 10 10 10 10 10 10



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tig. Shirty.	EN 60204-1	profession of the state of the	and the second second
Clause	Requirement - Test	Result - Remark	Verdic
	Where other material is used, its electrical resistance per unit length shall not exceed that of the allowable copper conductor and such conductors shall be not less than 16 mm <sup>2</sup> in cross-sectional area.		N/A
	The cross-sectional area of protective conductors shall be determined in accordance with the requirements of:  -543 of IEC 60364-5-54; or  -7.4.3.1.7 of IEC 60439-1, as appropriate.  This requirement is met in most cases if it is in accordance with Table 1 of this standard (see 5.2).		Po
3.2.3	Continuity of the protective bonding circuit		
AND STATE OF THE S	All exposed conductive parts are connected to the protective bonding circuit in accordance with 8.2.1.		P. S
	Parts that are mounted so that they do not constitute a hazard because cannot be touched on large surfaces or grasped with the hand and they are small in size (less than approximately 50 mm × 50 mm) or they are located so that either contact with live parts, or an insulation failure is unlikely need not be connected to the protective bonding circuit		
	Where a part is removed the protective bonding circuit for the remaining parts isn't interrupted.		P
Santa	Current-carrying capacity of connection and bonding points cannot impaired by mechanical, chemical, or electrochemical influences (e.g. electrolytic corrosion on aluminium parts)		P
September 1	Metal ducts of flexible or rigid construction and metallic cable sheaths are not used as protective conductors. Nevertheless they are connected to the protective bonding circuit.		P
	Where the electrical equipment is mounted on lids, doors, or cover plates, continuity of the protective bonding circuit shall be ensured.  The use of a protective conductor (see 8.2.2) is recommended.		N/A
e e e e e e e e e e e e e e e e e e e	For cables that are exposed to damage (for example flexible trailing cables) the continuity of the protective conductors are ensured by appropriate measures (for example monitoring).		N/A

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riti entre	EN 60204-1			
Clause	Requirement - Test	Result - Remark	Verdict	
8.2.4	No means of interruption of the protective bonding conductor are provided.  Exception: links for test or measurement purposes that cannot be opened without the use of a tool and that are located in an enclosed electrical operating area.		P.	
	As well the protective bonding circuit does not incorporate a switching device or an over current protective device (for example switch, fuse).		of P	
Server Server	Removable current collectors, plug/socket combinations or withdrawable plug-in units: The protective bonding circuit is interrupted by a first make last break contact. (see also 13.4.5)		N/A	
8.2.6	Protective conductor connecting points: have no other function and are not intended to attach or connect appliances or parts.		P	
	Each protective conductor connecting point is marked or labelled as such using the symbol IEC 60417-5019  or the letters PE or by use of bicolour GREEN / YELLOW		P	
8.2.7	Mobile machines with on-board power supplies: The protective bonding system is connected to a single protective bonding terminal. This protective bonding terminal is the connection point for a possible additional external incoming power supply.		N/A	
8.2.8	Electrical equipment having earth leakage currents higher than 10 mA a.c. or d.c.:  Additional protective bonding requirements: - Cross section of protective conductor ≥ 10 mm² CU or 16 mm² AL - OR Second protective conductor of at least the same cross sectional area if above cross section is impracticable - OR monitoring of continuity of protective conductor with automatic disconnection function.		N/A	
Statement of the statem	Additionally a warning label is provided adjacent to the PE terminal.		N/A	

9 8 1	CONTROL CIRCUITS AND CONTROL FUNCTIONS	P
9.1.	Control circuit	N/A



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o titi and a second	EN 60204-1		y a plant
Clause	Requirement - Test	Result - Remark	Verdict
9.1.1	Control circuit supply: Control transformers mandatory only when more then one motor starter or two control devices are used.		N/A
Spanner of the state of the sta	Control transformers with separate windings are used for supplying the control circuits.		N/A
gerten de service de la constante de la consta	Where several transformers are used, the secondary voltages are in phase.	1/1///	N/A
or and the state of the state o	Separate windings on transformer for DC supplies connected to PE.		N/A
grand de la company de la comp	Switch-mode units fitted with transformers in accordance with IEC 61558-2-17		N/A
9.1.2	The nominal voltage of control supply does not exceed 277 V when supplied from a transformer.		N/A
9.1.3	Control circuits are provided with overcurrent protection in accordance with 7.2.4 and 7.2.10.		N/A
9.2.	Control functions	and the second s	N/A
S and a supposed	Safety related control functions in accordance with ISC (2003) and /or IEC 62061 (see 9.4.1)	0 13849-1 (2006), ISO 13849-2	_
9.2.1	Start functions operating by energizing the relevant circuit (see 9.2.5.2).	1/1///	N/A
9.2.3	Operating modes		_
of Sandardin	Suitable means are prevented for unauthorized or inadvertent mode selection if hazardous situations can result.		N/A
Sand	Mode selection by itself does not initiate machine operation. A separate actuation of the start control has to be stated by the operator.		N/A
e de la companya de l	Indication of the selected operating mode is provided (e.g. the position of a mode selector, the provision of an indicating light, a visual display indication).		N/A
9.2.4	Where it is necessary to suspend safety functions and/or protective measures (for example for setting or maintenance purposes), protection is ensured.		N/A
9.2.5	Operation		_
grand and a second	Prevention of movement of the machine in an unintended or unexpected manner is taken after any stopping of the machine. (e.g. due to locked-off condition, power supply fault, battery replacement, lost signal condition with cableless control)		N/A
Salar	When a machine has more than one control station, measures are provided to ensure that initiation of commands from different control stations do not lead to a hazardous situation.		N/A



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ili e ili	EN 60204-1	Alici Si Anti Sitti	S tot page
Clause	Requirement - Test	Result - Remark	Verdict
9.2.5.2	Start of an operation is possible only when all of the		P.
9.2.0.2 9.00	relevant safety functions and/or protective measures are in place and are operational.		Service Servic
gardin Sant	Where safety functions and/or protective measures cannot be applied for certain operations, manual control of such operations are by hold-to-run controls, together with enabling devices, as appropriate.		N/A
	In the case of machines requiring the use of more than one control station to initiate a start, each of these control stations shall have a separate manually actuated start control device.  The conditions to initiate a start are:  - all required conditions for machine operation are met  - and all start control devices are in the released (off) position  - then all start control devices have to be actuated concurrently (see 3.6).		P
9.2.5.3	Stop category 0 and/or stop category 1 and/or stop category 2 stop functions are provided as indicated by the risk assessment and the functional requirements of the machine (see 4.1).		N/A
S Harden	Stop functions override related start functions	St. Andrew St. Market	N/A
	Facilities to connect protective devices and interlocks are provided, where required. If such a protective device or interlock causes a stop of the machine, it may be necessary for that condition to be signalled to the logic of the control system.  The reset of the stop function does not initiate any hazardous situation.		N/A
Supering Control	Where more than one control station is provided, stop commands from any control station is effective when required by the risk assessment of the machine.		N/A
9.2.5.4	Emergency operations (emergency stop, emergency s	switching off)	and a second
, tri grande tri	Emergency stop or emergency switching off commands are sustained until it is reset.		P
Setting of the set of	This reset is possible only by a manual action at that location where the command has been initiated.		P,
Superinter S	The reset of the command does not restart the machinery but only permit restarting.		N/A
general grand	It is not be possible to restart the machinery until all emergency stop commands are reset.		N/A
S Harrier Co.	It is not be possible to reenergize the machinery until all emergency switching off commands are reset.		N/A



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atti and	EN 60204-1	A ST ST ST	
Clause	Requirement - Test	Result - Remark	Verdict
State of the state		and the second s	of the state of th
9.2.5.4.2	The emergency stop does function either as a stop category 0 or as a stop category 1.		of Special Papers
S transfer S	- it overrides all other functions and operations in all modes;		P
9.2.5.4.3	Emergency switching off is provided where: -Protection against direct contact is achieved only by placing out of reach or by obstacles (see 6.2.6) - or there is the possibility of other hazards or damage caused by electricity.		N/A
	Emergency switching off is accomplished by electromechanical switching devices, effecting a stop category 0 of machine actuators connected to this incoming supply.		N/A
9.2.5.5	Movement or action that can result in a hazardous situation are monitored by providing, for example, overtravel limiters, motor overspeed detection, mechanical overload detection or anti-collision devices.		N/A
9.2.6	Other control functions	September Septem	Supplied -
9.2.6.2	No type 1 two-hand control device is used for the initiation of hazardous operation. It need type 2 or type 3 two-hand control devices for such operations.		N/A
9.2.6.3	Enabling control: Enabling control are arranged in the way to minimize the possibility of defeating, e. g. by requiring the deactivation of the enabling control device before machine operation may be reinitiated. It is not possible to defeat the enabling function by simple means.		P
9.2.6.4	Combined start and stop controls: Push-buttons etc. that alternately initiate and stop motion are provided only for functions, which cannot result in a hazardous situation.		N/A
9.2.7	Cableless control station	S Barry Barry	N/A
9.2.7.1	Means shall be provided to readily remove or disconnect the power supply of the operator control station (see also 9.2.7.3).		N/A
September S	Means (for example key operated switch, access code) are provided, as necessary, to prevent unauthorized use of the operator control station.		N/A
September September 1	Each operator control station carries an unambiguous indication of which machine(s) is (are) intended to be controlled by that operator control station.		N/A



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Gitti Ripiti	EN 60204-1				
Clause	Requirement - Test	Result - Remark	Verdict		
9.2.7.2	Measures shall be taken to ensure that control commands:  – affect only the intended machine;  – affect only the intended functions.		N/A		
general Support	Measures are taken to prevent the machine from responding to signals other than those from the intended operator control station(s).		N/A		
	Where necessary, means are provided so that the machine can only be controlled from operator control stations in one or more predetermined zones or locations.		N/A		
9.2.7.3	Operator control stations include a separate and clearly identifiable means to initiate the stop function of the machine or of all the operations that can cause a hazardous situation.  The actuating means to initiate this stop function are not marked or labelled as an emergency stop device, even though the stop function initiated on the machine can fulfil an emergency stop function.		N/A		
	Stopping of the machine and preventing a potentially hazardous operation is automatically initiated in the following situations:  — when a stop signal is received;  — when a fault is detected in the cableless control system;  — when a valid signal (which includes a signal that communication is established and maintained) has not been detected within a specified period of time (see Annex B), except when a machine is executing a pre-programmed task taking it outside the range of the cableless control where no hazardous situation can occur.		N/A		
9.2.7.4	Machines having more than one operator control station, including one or more cableless control stations, have measures provided to ensure that only one of the control stations can be enabled at a given time.		N/A		
	An indication of which operator control station is in control of the machine is provided at suitable locations as determined by the risk assessment of the machine.  Exception: a stop command from any one of the control stations are effective when required by the risk assessment of the machine.		N/A		
9.2.7.5	Battery-powered cableless operator control stations: A variation in the battery voltage does not cause a hazardous situation.		N/A		



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Clause	Requirement - Test	Result - Remark	Verdict
Sent Sent Sent Sent Sent Sent Sent Sent	A clear warning is given to the operator when a variation in battery voltage exceeds specified limits.		N/A
September 1	Under those circumstances, the cableless operator control station remains functional long enough for the operator to put the machine into a non- hazardous situation.		N/A
9.3	Protective interlocks	S. S	N/A
9.3.1	The reclosing or resetting of an interlocking safeguard does not initiate hazardous machine operation.		N/A
9.3.2	Where overtraveling an operating limit (for example speed, pressure, position) can lead to a hazardous situation, means are provided to detect when a predetermined limit(s) is exceeded and initiate an appropriate control action.		N/A
9.3.3	The correct operation of auxiliary functions is checked by appropriate devices.		N/A
e de la companya de l	Appropriate interlocking is provided, when non- operation of an auxiliary function (for example lubrication, supply of coolant, swarf removal) can cause a hazardous situation, or cause damage to the machine or to the work in progress.		N/A
9.3.4	Interlocks between different operations and for contrary motions are provided if this operations lead to hazardous situations.		N/A
9.3.5	Reverse current braking: Where braking of a motor is accomplished by current reversal, measures prevent the motor starting in the opposite direction at the end of braking where that reversal can cause a hazardous situation or damage to the machine or to the work in progress.		N/A
Statement of the state of the s	For this purpose, a device operating exclusively as a function of time is not permitted.		N/A
September of	Control circuits are arranged that rotation of a motor shaft, for example manually, does not result in a hazardous situation.		N/A
9.4	Control functions in the event of failure	/ 1 1 1	P.
9.4.1	The safety related electrical control circuits have an appropriate level of safety performance that has been determined from the risk assessment at the machine. The requirements of IEC 62061 and/or ISO 13849-1, ISO 13849-2 are met.		P



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Clause	Requirement - Test Result - Remark	Verdic
Siddoc 5	Treduit Treduit Test	y Cidio
, de la companya del companya de la companya del companya de la co	Where memory retention is achieved for example, by battery power, measures are taken to prevent hazardous situations arising from failure or removal of the battery.	N/A
grandi Santanani	Means are provided to prevent unauthorized or inadvertent memory alteration by, e.g. requiring the use of a key, access code or tool.	N/A
9.4.2	Measures are taken to minimize risk in the event of failure:	_
9.4.2.1	- Use of proven circuit techniques and components	or P ⊚
9.4.2.2	- Provisions of partial or complete redundancy	P
9.4.2.3	- Provision of diversity	P
9.4.2.4	- Provision for functional tests	P.
9.4.3	Protection against mal-operation due to earth faults, voltage interruptions and loss of circuit continuity	_
9.4.3.1	Earth faults on any control circuit don't cause unintentional starting, potentially hazardous motions, or prevent stopping of the machine.  Methods to meet these requirements include but are not limited to the following:	_
Sandard S	a) 1) Control circuits, fed by control transformers and connected to the protective bonding circuit at the point of supply. (PELV) (see Figure 3 of this standard)	P p
	a) 2) Control circuits, fed by control transformers without connection to the protective bonding circuit at the point of supply in the arrangement according to figure 3 and having a device that interrupts the circuit automatically in the event of an earth fault	N/A
	b) Control circuits fed by a control transformer with a centre-tapped winding, this centre tap connected to the protective bonding circuit, arranged as shown in Figure 4 of this standard with the overcurrent protective device having switching elements in all control circuit supply conductors.	N/A
	c) Where the control circuit is not fed from a control transformer and is either:  1) directly connected between the phase conductors of an earthed supply, or;  2) directly connected between the phase conductors or between a phase conductor and a neutral conductor of a supply that is not earthed or is earthed through a high impedance, multpole switch that switch all live conductors are used for those functions that can cause hazardous situations or damage to the machine.	N/A
S Iri	Or in case of c) 2), a device is provided that interrupts	N/A



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Supplied Supplied	Result - Remark	Verdict	
e de la companya del companya de la companya del companya de la co		S. Hoteley .	
ry device(s),	a de la companya del companya de la companya del companya de la co	N/A	

Clause	Requirement - Test	Result - Remark	Verdict
S. Held			e Harriston !
9.4.3.2	For control systems using a memory device(s), proper functioning in the event of power failure is ensured (e.g. by using a non-volatile memory) to prevent any loss of memory that can result in a hazardous situation.		N/A
9.4.3.3	Upon sliding contacts the loss of continuity of safety- related control circuits depending on, can result in a hazardous situation. Appropriate measures are taken (for example by duplication of the sliding contacts).		N/A

10	OPERATOR INTERFACE AND MACHINE-MOUNTED CONTROL DEVICE	S P
10.1.1	As far as is practicable, those devices are selected, mounted, and identified or coded in accordance with relevant parts of IEC 61310.	, P
10.1.2	As far as is practicable, machine-mounted control devices are:  – readily accessible for service and maintenance;	P
S grander	mounted in such a manner as to minimize the possibility of damage from activities such as material handling.	N/A
Special Special Special	The actuators of hand-operated control devices are selected and installed so that:  – they are not less than 0,6 m above the servicing level and	N/A
September 1	are within easy reach of the normal working position of the operator;	N/A
and the second	the operator is not placed in a hazardous situation when operating them.	N/A
g property Set	The actuators of foot-operated control devices are selected and installed so that:  – they are within easy reach of the normal working position of the operator;	N/A
st Superiti	the operator is not placed in a hazardous situation when operating them.	N/A
10.1.3	The degree of protection (see IEC 60529) together with other appropriate measures does afford protection against:	P.
Surger Surger of the Surger of	the effects of aggressive liquids, vapours, or gases found in the physical environment or used on the machine;	P.
State of the state	the ingress of contaminants (for example swarf, dust, particulate matter).	N/A



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Clause	Requirement - Test	Result - Remark	Verdict
S <sup>ir</sup>		and the second s	Arti Salari
getti Spanistri	The operator interface control devices has a minimum degree of protection against direct contact of IPXXD (see IEC 60529).		N/A
10.1.4	Position sensors (for example position switches, proximity switches) are so arranged that they will not be damaged in the event of overtravel.		N/A
Salar Salar	Position sensors in circuits with safety-related control functions shall have direct opening action (see IEC 60947-5-1) or shall provide similar reliability (see 9.4.2).		N/A
10,1.5	Portable and pendant operator control stations and their control devices are so selected and arranged as to minimize the possibility of inadvertent machine operations caused by shocks and vibrations		P
10.2	Push-buttons	September 1987	P Supplement
10.2.1	Mandatory: The colour RED is used only for emergency stop and emergency switching off actuators.		P
g. tit Springerid	The recommend colours of push-buttons are as shown in table 2 of this standard.		P. P.
10.2.2	The recommend markings on push-buttons are as shown in table 3 of this standard.		P.
10.3	Indicator lights and displays	and the state of t	put and put of the same
10.3.1	Indicator lights and displays are selected and installed in such a manner as to be visible from the normal position of the operator (see also IEC 61310-1).		P
Sentender Tri	Indicator light circuits used for warning lights are fitted with facilities to check the operability of these lights.	/././.	Sant P St
ge e	The recommend colours on Indicator light are as shown in table 4 of this standard.		P S
S arter S arter S	Indicating towers on machines have the applicable colours in the following order from the top down; RED, YELLOW, BLUE, GREEN and WHITE.		P
September Septem	Where flashing lights or displays are used to provide higher priority information, audible warning devices should also be provided.		P,
10.4	illuminated push-button actuators are colour-coded in accordance with Tables 2 and 4. Where there is difficulty in assigning an appropriate colour, WHITE is used.		N/A
Substitute the	The colour RED for the emergency stop actuator shall not depend on the illumination of its light.		N/A



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rtist Russian	EN 60204-1	gardi San Maria San Maria	and the second second
Clause	Requirement - Test	Result - Remark	Verdict
10.5	Devices having a rotational member, such as potentiometers and selector switches, have means of prevention of rotation of the stationary member. Friction alone isn't considered sufficient.		P
10.6	Actuators used to initiate a start function or the movement of machine elements (for example slides, spindles, carriers) are constructed and mounted so as to minimize inadvertent operation.		P
production of the second	However, mushroom-type actuators are used for two-hand control only. (see also ISO 13851).		N/A
10.7	Emergency stop devices	Service of the servic	P State
10.7.1	Devices for emergency stop are readily accessible.	and the state of t	e de la companya del companya de la companya del companya de la co
and the state of t	They are located at each operator control station and at other locations where the initiation of an emergency stop can be required (exception: see 9.2.7.3).		P
	In circumstances where confusion can occur between active and inactive emergency stop devices caused by disabling the operator control station, means (for example, information for use) are provided to minimise confusion.		N/A
10.7.2	Allowed types of device for emergency stop:  – a push-button operated switch with a palm or mushroom head type;  – a pull-cord operated switch;  – a pedal-operated switch without mechanical guard.		P
Harden tri	The devices are direct opening operation (see IEC 60947-5-1, Annex K).		P of
10.7.3	Actuators are coloured RED. If a background exists immediately around the actuator, then this background is coloured YELLOW. See also ISO 13850.		P
10.7.4	The supply disconnecting device may be locally operated to serve the function of emergency stop when:  — it is readily accessible to the operator; and — it is of the type described in 5.3.2 a), b), c), or d).  When also intended for this use, the supply disconnecting device meets the colours RED/YELLOW.		N/A
10.8	Emergency switing off device	of Settle of the	N/A
10.8.1	Means are provided, where necessary, to avoid confusion between these devices.		N/A



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Clause	Requirement - Test	Result - Remark	Verdict		
10.8.2	The types of device for emergency switching off		N/A		
10.6.2	include:  - a push-button operated switch with a palm or mushroom head type of actuator;  - a pull-cord operated switch.  The devices are direct opening action (see IEC 60947-5-1, Annex K).  The push-button operated switch may be in a break-glass enclosure.		N/A		
10.8.3	Actuators are coloured RED. If a background exists immediately around the actuator, then this background is coloured YELLOW. See also ISO 13850.		N/A		
10.8.4	Where the supply disconnecting device is to be locally operated for emergency switching off, it is be readily accessible and meets the colours RED/YELLOW.		N/A		
10.9	Enabling control device		N/A		
S Spring	An enabling control device as a part of a system, does allow operation when actuated in one position only. In any other position, operation is stopped or prevented.		N/A		
	Functions of two-position types: position 1: off-function of the switch (actuator is not operated); position 2: enabling function (actuator is operated)		N/A		
	Functions of three-position types: position 1: off-function of the switch (actuator is not operated); position 2: enabling function (actuator is operated in its mid position); position 3: off-function (actuator is operated past its mid position); when returning from position 3 to position 2, the enabling function is not activated.		N/A		

11	CONTROLGEAR: LOCATION, MOUNTING AND EN	CLOSURES	P
11.2.1	All items of controlgear (inclusively terminals that are not part of controlgear components or devices) are placed and oriented so that they can be identified without moving them or the wiring.		P P
	For items that require checking for correct operation or that are liable to need replacement, those actions should be possible without dismantling other equipment or parts of the machine (except opening doors or removing covers, barriers or obstacles).		P



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Clause	Requirement - Test	Result - Remark	Verdict
Siddoo s	Troquironoin Test	Troodic Tromant	Volulo
gerti Spreed	All controlgear are mounted so as to facilitate its operation and maintenance from the front.		P.
Suppose of the state of the sta	Necessary tools to adjust, maintain, or remove a device are supplied.		P. P.
Special Special	Where access is required for regular maintenance or adjustment, the relevant devices shall be located between 0,4 m and 2,0 m above the servicing level.		P
grander State Stat	Terminals are least 0,2 m above the servicing level and so placed that conductors and cables can be easily connected to them.		P
Server Server	Only operating, indicating, measuring, and cooling devices are mounted on doors or on normally removable access covers of enclosures.		P.
are and the same of the same o	Plug-in arrangements of control devices and plug-in-de	evices:	profits
ti Statement Si	The connection is clearly identified by shape, marking or reference designation, singly or in combination.		N/A
Same Same	When they have to bee handled during normal operation means are provided with non-interchangeable features where the lack of such a facility can result in malfunctioning.		N/A
g profes	Plug/socket combinations that are handled during normal operation are unobstructedly accessible.		N/A
	Test points for connection of test equipment are:  – unobstructedly accessible;  – clearly identified to correspond with the documentation;  – adequately insulated;  – sufficiently spaced.		N/A
11.2.2	Non-electrical parts and devices, not directly associated with the electrical equipment, are not located within enclosures containing controlgear.		P
Springer	Devices such as solenoid valves are separated from the other electrical equipment (for example in a separate compartment).		N/A
ed Salari	Control devices mounted in the same location and connected to the supply voltage, or to both supply and control voltages, are grouped separately from those connected only to the control voltages.		«P
pl of of	Terminals shall be separated into groups for:  – power circuits;  – associated control circuits;  – other control circuits, fed from external sources (for example for interlocking).		P



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EN 60204-1			
Clause	Requirement - Test	Result - Remark	Verdict
B" Japan Baran			me tei
	The clearances and creepage distances specified by the supplier are maintained, taking into account the external influences or conditions of the physical environment.		P
11.2.3	Heat generating components (for example heat sinks, power resistors) are located so, that the temperature of each component in the vicinity remains within the permitted limit.		P
	Controlgears are sufficiently protected against: - ingress of solid foreign objects - liquids - dust, coolants, and swarf, taking into account the external influences under which the machine is intended to operate (i.e. the location and the physical environmental conditions).		P
	Enclosures of controlgear provide a degree of protection of at least IP22 (see IEC 60529).  Exceptions:  a) specific electrical operating area b) When with removable collectors on conductor wire or conductor bar systems do not achieve IP22 measures of 6.2.5 are applied.		N/A
11.4	Enclosures, doors and openings	S <sup>M</sup> phill Shift Spill	P
	Enclosures (inclusively screens of windows (windows: toughened glass or polycarbonate sheet of not less than 3 mm thickness), joints, gaskets of doors and lids) do withstand the foreseeable mechanical, electrical and thermal stresses and other environmental factors and of the aggressive liquids, vapours, or gases used on the machine.		P
Supplied of Supplied of	Fasteners used to secure doors and covers are of the captive type.		N/A
generativ Springer	Enclosure doors are not wider than 0,9 m and have vertical hinges, with an angle of opening > 95°.	1/1/1/	N/A
	Openings in enclosures (for example, for cable access), including those towards the floor or foundation or to other parts of the machine are equipped with means to ensure the degree of protection specified for the equipment.		P
Superfected St	A suitable opening may be provided in the base of enclosures within the machine so that moisture due to condensation can drain away.		Sandari Sandari in
gge tid Springer	Openings for cable entries shall be easily re-opened on site.		N/A



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EN 60204-1			
Clause	Requirement - Test	Result - Remark	Verdict
e de la companya de l	No openings between enclosures containing electrical equipment and compartments containing coolant, lubricating or hydraulic fluids, or those into which oil, other liquids, or dust can penetrate.		P
	Holes in an enclosure for mounting do not impair the required protection.		P
	Equipment that, in normal or abnormal operation, can attain a surface temperature sufficient to cause a risk of fire or harmful effect to an enclosure material is:  — located within an enclosure that will withstand, such temperatures; and  — is located at a sufficient distance from adjacent equipment allowing safe dissipation of heat (see also 11.2.3); or  — is otherwise screened by material that can withstand to the harmful effect.		P
11.5	Access to control gear	part Salar Salar	N/A
	Doors in gangways for access to electrical operating areas:  – are at least 0,7 m wide and 2,1 m high;  – do open outwards;  – have a means (for example panic bolts) to allow opening from the inside without the use of a key or tool.		N/A
Support Support	Enclosures which readily allow a person to fully enter are be provided with means to allow escape, e.g. panic bolts on the inside of doors.		N/A
	Enclosures intended for such access, for example for resetting, adjusting, maintenance, shall have a clear width of at least 0,7 m and a clear height of at least 2,1 m  When equipment is likely to be live during access with > 1,0m and when on both side with > 1.5m.		N/A

12	CONDUCTORS AND CABLES	Po por
S and the state of	IMPORTANT: The following requirements do not apply to the integral wiring of assemblies, subassemblies, and devices that are manufactured and tested in accordance with their relevant IEC standard (for example IEC 60439-1).	
12.2	In general, conductors are of copper.  Where aluminium conductors are used, the cross-sectional area is at least 16 mm².	8" P, 1"
Andread State of Stat	The cross-sectional areas of conductors are according to Table 5 and its notes.	P S S S
article Spirit	All conductors that are often in movement ( > one movement per hour of machine operation) have flexible stranding of class 5 or class 6.	P



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Har Market	EN 60204-1		- Application of the second of
Clause	Requirement - Test	Result - Remark	Verdict
	Where the insulation of conductors and cables (for example PVC) can constitute hazards due to the propagation of a fire or the emission of toxic or corrosive fumes adequate means are provided.  Special attention is given to the integrity of a circuit		P
	having a safety-related function  Minimum insulation test voltages for used cables are:  -≥ 2 000 V a.c. for a duration of 5 min for operation at voltages higher than 50 V a.c. or 120 V d.c., or  -≥ 500 V a.c. for a duration of 5 min for PELV circuits (see IEC 60364-4-41, class III equipment).		P
State of the state	Insulation strong enough to withstand damage due to operation or during laying, especially for cables pulled into ducts.		P.
12.4	Current-carrying capacity in normal service in accordance with table 6.  Or in accordance with suppliers recommendation.		P.
12.6	Flexible cables	art Salahari di daparti	P.
12.6.1	All flexible cables have Class 5 or Class 6 conductors.		P
	Cables under severe duties are adequately protected against: - abrasion due to mechanical handling and dragging across rough surfaces; - kinking due to operation without guides; - stress resulting from guide rollers and forced guiding, being wound and re-wound on cable drums.		N/A
12.6.2	The tensile stress applied to copper conductors does not exceed 15 N/mm2 of cross-sectional area.  Or special measures are taken to withstand the applied stress.  For material other than copper the applied stress is within the cable manufacturer's specification.		N/A
12.6.3	For cables installed on drums, the maximum current-carrying capacity in free air is derated in accordance with Table 7.		N/A
12.7	Conductor wires, conductor bars and slip-ring assemb	lies	» N/A



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EN 60204-1				
Clause	Requirement - Test	Result - Remark	Verdict	
12.7.1	During normal access to the machine, protection against direct contact to conductor wires, conductor bars and slip-ring assemblies is achieved by the application of one of the following protective measures:  – protection by partial insulation of live parts, or where this is not practicable;  – protection by enclosures or barriers of at least IP2X.		N/A	
and the state of t	Horizontal top surfaces of barriers or enclosures that are readily accessible provide a degree of protection of at least IP4X.		N/A	
general Services	Where the required degree of protection is not achieved, protection by placing live parts out of reach in combination with emergency switching off in accordance with 9.2.5.4.3 is applied.		N/A	
	Conductor wires and conductor bars are so placed / protected as to:  – prevent contact with conductive items such as the cords of pull-cord switches, strain-relief devices and drive chains;  – prevent damage from a swinging load.		N/A	
12.7.2	Protective conductor circuit (PE) and the neutral conductor (N) each use a separate conductor wire, conductor bar or slip-ring.		N/A	
e de la companya de l	The continuity of the protective conductor circuit using sliding contacts is ensured by taking appropriate measures (for example, duplication of the current collector, continuity monitoring)		N/A	
12.7.3	Protective conductor current collectors have a shape or construction so that they are not interchangeable with the other current collectors. Such current collectors shall be of the sliding contact type.		N/A	
12.7.4	Removable current collectors (e.g. swivelingable) with disconnector function: The protective conductor circuit interrupts after and reconnects before any live conductor.		N/A	
12.7.5	Clearances in air between conductors and adjacent systems are suitable at least a rated impulse voltage of an overvoltage category III in accordance with IEC 60664-1 (For example 4 kV for 230/400 V systems → clearances 3mm)		N/A	



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EN 60204-1			
Clause	Requirement - Test	Result - Remark	Verdict
		S print St print State	Alt Salation S
12.7.6	Creepage distances between conductors and adjacent systems are suitable suitable for operation in the intended environment, e.g. open air (IEC 60664-1), inside buildings, protected by enclosures.  In abnormally dusty, moist or corrosive environments, the following creepage distance requirements apply:  – unprotected conductor etc.: minimum creepage dist. of 60 mm  – enclosed conductor etc.: minimum creepage distance of 30 mm		N/A
12.7.7	Conductor system divided into isolated sections: suitable design measures are employed to prevent the energization of adjacent sections by the current collectors themselves.		N/A
12.7.8	Construction of conductor wires etc.: - power circuits are grouped separately from those in control circuits do withstand the foreseeable mechanical forces and thermal effects of short-circuit current covers can not be opened without the use of a tool - all conductive parts of accompanying enclosures are connected to the protective bonding circuit - underground and underfloor conductor bar ducts have drainage facilities		N/A

13	WIRING PRACTICES	of the second se	S P petri
13.1	Connections and routing		State P Statement
13.1.1	All connections are secured against accidental loosening.		P and the
State of the state	The means of connection are suitable for the cross- sectional areas and nature of the conductors being terminated.		P S
gordi Spragadoù	No connection of two or more conductors to one terminal, unless the terminal is designed for it.		P
Shipping the	No soldered connections to terminals unless they are suitable for it.		P,
geterid &	Terminals on terminal blocks are plainly marked or labelled corresponding with the diagrams.		N/A
area to see a second	Installations of flexible conduits and cables are such that liquids drain away from the fittings.		N/A
S of S of the state of the stat	Retaining means for conductor strand and shields provided (no soldering for that purpose)		P S



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Clause 🪽	Requirement - Test	Result - Remark	Verdict
Brandi State Heli		A STATE OF THE STA	of the state of th
getti Spranteriti	Indentification tags legible, permanent, and appropriate for the physical environment.		8 P.
Salar	Terminal blocks mounted and wired so that the internal and external wiring does not cross over the terminals (see IEC 60947-7-1).		N/A
13.1.2	Conductors and cables run from terminal to terminal without splices or joints.		P
grand Sand	Connections using plug/socket combinations with suitable protection against accidental disconnection are not considered to be joints for the purpose of this subclause.		
	Terminations of cables are adequately supported to prevent mechanical stresses at the terminations of the conductors.		P
si Spanis	Protective conductor placed close to the associated live conductors in order to decrease the impedance of the loop.		P
13.1.3	Conductors for circuits that operate at different voltages are separated by suitable barriers, or are insulated for the highest voltage that occurs within the same duct.		P
13.2	Connections and routing		N/A
13.2.1	Each conductor is identifiable at each termination in accordance with the technical documentation.		September 1
13.2.2	The protective conductor has the bicolour combination GREEN-AND-YELLOW		P
	Where the protective conductor can be easily identified colour coding throughout its length is not necessary, but the ends or accessible locations are clearly identified by the graphical symbol or by the bicolour combination GREEN-AND-YELLOW.		
13.2.3	Neutral conductors are identified by the colour LIGHT BLUE. That colour is not used for identifying any other conductor where confusion is possible.		N/A
e de la companya de l	Bare conductors used as neutral conductors have at minimum a stripe in LIGHT BLUE 15 mm to 100 mm wide in each compartment or unit and at each accessible location.		N/A
general Superal	Identification by colour for other conductors: Colours GREEN or YELLOW are not used. (Details to colour coding see this norm Cl. 13.2.3)		P
13.3	Wiring inside enclosures	ge <sup>rti</sup> S <sup>atr</sup> iti Satr	P and



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itis and the state of the state	EN 60204-1	agenticia September 12	
Clause	Requirement - Test	Result - Remark	Verdict
e profession of the second	Conductors inside enclosures are supported where necessary. Conductors and cables that do not run in ducts are adequately supported.		P
general Superior	Non-metallic supports are made with a flame- retardant insulating material (see IEC 60332 series)		st st st
Sparent Sparent	Connections to devices mounted on doors or to other movable parts are using flexible conductors in accordance with 12.2 and 12.6.		P
13.4	Wiring outside enclosures		N/A
13.4.2	Conductors and their connections external to the electrical equipment are placed in suitable ducts (see cl.13.5).		N/A
	Exceptions: - Cables with special suitable protection Position switches or proximity switches supplied with a dedicated cable which is sufficiently short.		
geti Spranti	Connections to moving elements of the machine are made of flexible cable in accordance with 12.2 and 12.6.		N/A
Salar Sa	Bending radius of the cable are of at least 10 times the diameter of the cable		N/A
State of the state	Cables close to moving parts, maintain a space of at least 25 mm between the moving parts and the cables or barriers are provided.		N/A
and the second	Cable handling systems: Lateral cable angles do not exceeding 5°, at being wound on and off cable drums or approaching and leaving cable guidance devices. The bending radius is in accordance with table 8.		N/A
	Flexible conduit: - is not used for connections to rapidly or frequently moving parts, except when specifically designed for that purpose is supported when adjacent to moving parts		N/A
13.4.4	Interconnection of devices on the machine is made through adequate terminals.		N/A

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ist. Salatana	EN 60204-1	1 1 1 1 1 1	
Clause	Requirement - Test	Result - Remark	Verdict
10 % 5	December 1 and 1 a		AL/A
13.4.5	Requirements to plug/socket combinations outside of enclosures:		N/A
	Exceptions: components connected to a bus system by a plug/socket combination		Marketon Santa Santa
	a) Prevention for unintentional contact with live parts at any time.		e e e e e e e e e e e e e e e e e e e
	At least IPXXB. (PELV circuits are excepted from this requirement.)		Sent Sent
	b) First make last break protective bonding contact if used in TN- or TT-systems.		art of other
	c) Sufficient load-breaking capacity, when intended to be disconnected under running conditions.		Supposed S
	When rated at ≥ 30 A interlocked with a switching device		Springer St.
	d) When rated at ≥ 16 A having a retaining means to prevent unintended or accidental disconnection.		art Sant S
	e) when unintended or accidental disconnection +can cause a hazardous situation, having a retaining		Sandard Sandard
	means. f) Component remaining live after disconnection		grand State State of
	having at least IP2X or IPXXB, taking into account the required clearance and creepage distances.(PELV circuits are excepted from this		Start Start Start
	requirement.) g) Metallic housings of plug/socket combinations		Marketin Santi
	being connected to the protective bonding circuit.  (PELV circuits are excepted from this requirement.)		of San
	h) Having retaining means to prevent unintended or accidental disconnection and being marked that they		State of State of
	are not intended to be disconnected under load.  i) Clearly identifiable if more then one plug / socket		
	per device. It is recommended that mechanical coding being used.		and the state of t
	j) When used in control circuits fulfilling the applicable requirements of IEC 61984. Exception: see item k).		Statement St.
	k) No plug/socket combinations intended for household and similar general purposes used for control circuits. In plug/socket combinations in		general Secretaria Sec
	accordance with IEC 60309-1, only those contacts shall be used for control circuits which are intended		Street Street
	for those purposes.		gent Sent
of Springer	Exception: The requirements of item k) do not apply to control functions using high frequency signals on the power supply.		6" of " ; d
3.4.6	Protection of Plug / socket from the physical environment during transportation and storage.	1 6 / 1 6 /	P
3.5	Ducts, connection boxes and other boxes	September 1	P
S menter in	Provided with a degree of protection suitable for the application.		and P and



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rite' entrette	EN 60204-1	gled St. Att. Steller	The state of the s
Clause	Requirement - Test	Result - Remark	Verdic
grand Sandard	No sharp edges, flash, burrs, rough surfaces, or threads with which the insulation of the conductors can come into contact.		P
S plante to	Where human passage is required, least 2 m above the working surface.		N/A
grand to the state of the state	Not used as connection for protective bonding circuit.	S pro ser pro ser	P
S. Harrier Chr.	Where cable trays are a.s.o. are only partially covered, the cables used are of a suitable type.		N/A
13.5.2 -	Filling the percentage of ducts adapted to the straightness and length of the duct and the flexibility of the conductors.		P 6
13.5.3	Rigid metal conduit and fittings shall galvanized steel or of a corrosion-resistant material		N/A
Statement of the	Fittings compatible with the conduit.	e de la companya de l	N/A
S. Shire.	Conduit bends properly made	garden Sir Sandard Sir Sandard	N/A
13.5.4	Flexible metal tubing or woven wire armour suitable for the expected physical environment.		N/A
13.5.5	Flexible non-metallic conduit resistant to kinking and suitable for the expected physical environment.		N/A
13.5.6	Requirements to cable trunking systems: - Rigidly supported and clear of all moving or contaminating portions of the machine - Covers overlapping the sides and attached.		N/A
13.5.7	The compartments of machine used as cable trunking systems are isolated from coolant or oil reservoirs and are entirely enclosed, and the conductors are secured.		N/A
13.5.8	Connection boxes and other boxes used for wiring:  - Are accessible for maintenance.  - Provide protection against the ingress of solid bodies and liquids, taking into account the external influences under which the machine is intended to operate (see 11.3).  - Do not have unused knockouts etc.		N/A
13.5.9	Motor connection boxes: Encloses only connections to the motor and motor- mounted devices (e.g brakes, temperature sensors)		P

14	ELECTRIC MOTORS AND ASSOCIATED EQUIPMENT		P
14.1	Electric motors are conform to the relevant parts of IEC 60034 series.		P grands
a Salahari	There protection is conform to the requirements given in 7.2 for overcurrent protection, in 7.3 for overload protection, and in 7.6 for overspeed protection.		P pri



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Clause	Requirement - Test	Result - Remark	Verdict
Olause	requirement - rest	Ttosuit - Itomant	Verdice
S to another section of	Motor control equipment is located and mounted in		e P
pa <sup>rli</sup> San	accordance with Clause 11.		et grand by grand
14.2	Minimal IP23 protection for all motors.  More stringent requirements depending on the application and the physical environment.		P
14.4	Motors incorporated as an integral part of the machine are adequately protected from mechanical damage.		P
and the state of t	motors and its associated parts (inclusively motor connection box) are easily accessible for inspection and maintenance etc		N/A
September Sept	Cooling is ensured and the temperature rise remains within the limits of the insulation class (see IEC 60034-1)		P d
e de la companya de l	No opening between the motor compartment and any other compartment that does not meet the motor compartment requirements.		P
14.5	The characteristics of motors and associated equipment are selected in accordance with the anticipated service and physical environmental conditions (see 4.4).  Detailed criteria see 14.5 of this norm.		P
14.6	Overload and overcurrent protective devices for mechanical brake actuators initiate simultaneously the deenergization (release) of the associated motors.		N/A
15	ACCESSORIES AND LIGHTING	grand and the state of the stat	N/A
15.1	Requirements for socket-outlets for accessory equipment:  - conform to IEC 60309-1 (Where that is not practicable, they are clearly marked with voltage and current ratings);  -continuity of the protective bonding circuit to the socket-outlet is ensured, except where protected by PELV;  - unearthed conductors connected to the socket-outlet are overcurrent- and if required overload-protected  - protection is separately from other circuits;  - power supply to the socket-outlet is not disconnected by the supply disconnecting device for the machine or the section of the machine, the		N/A

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refer to the second	EN 60204-1		and the state of t
Clause	Requirement - Test	Result - Remark	Verdict
S. Harden Lini			Zarania di Sarania di
15.2.1	Requirements for local lighting of the machine and equipment: - protective bonding circuit in accordance with 8.2.2 ON/OFF switch incorporated in the lamp-holder or in the flexible connecting cords Stroboscopic effects avoided Where fixed lighting electromagnetic compatibility is taken into account.		N/A
15.2.2	Requirements to the power supply for local lighting:  Nominal voltage not exceeding 250 V between conductors  isolating transformer connected to the load side of the supply with overcurrent protection in the secondary circuit; or  isolating transformer connected to the line side of the supply disconnecting device with overcurrent protection in the secondary circuit. That source is permitted for maintenance lighting circuits in control enclosures only; or  from a machine circuit with dedicated overcurrent protection; or  from an isolating transformer connected to the line side of the supply disconnecting device, provided with a dedicated primary disconnecting means and secondary overcurrent protection, and mounted within the control enclosure adjacent to the supply disconnecting device; or  from an externally supplied lighting circuit (for example factory lighting supply). This shall be permitted in control enclosures only, and for the machine work light(s) where their total power rating is not more than 3 kW.		N/A
Springer Springer	Exception: Where fixed lighting is out of reach of operators during normal operations, the provisions of this subclause do not apply.		
15.2.3	All unearthed conductors of circuits supplying lighting have their own overcurrent protecting devices.		N/A
15.2.4	Requirements to the fittings for local lighting:  - Adjustable lighting fittings are suitable for the physical environment.  - lamp holders are in accordance with the relevant IEC standard;  - lamp holders are constructed with an insulating material protecting the lamp cap  - Reflectors are supported by a bracket and not by the lamp holder.		N/A
	Exception: where fixed lighting is out of reach of operators during normal operation, the provisions of this subclause do not apply.		of the state of th



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Clause	Requirement - Test		Result - Remark	Verdict

16	MARKING, WARNING SIGNS AND REFERENCE DE	SIGNATIONS	P }
16.1	Warning signs, nameplates, markings, and identification plates are of sufficient durability to withstand the physical environment.		P',
16.2.1	Enclosures that do not clearly show that they contain electrical equipment that has a risk of electric shock are marked with the graphical symbol visible on the enclosure door or cover.  Exception:  - enclosure equipped with a supply disconnecting device;  - operator-machine interface or control station;  - a single device with its own enclosure (for example position sensor).		P
16.2.2	Hazardous hot surfaces of the electrical equipment, are equipped with the graphical warning symbol		P,
16.2.3	Control devices, visual indicators, and displays are clearly and durably marked to their functions.		<b>P</b> (*)
16.2.4	Equipment (e.g. controlgear assemblies) is legibly and durably marked.  A nameplate is attached to the enclosure adjacent to each incoming supply with:  - name or trade mark of supplier;  - certification mark, when required;  - serial number, where applicable;  - rated voltage, number of phases and frequency (if a.c.),  - full-load current for each supply;  - short-circuit rating of the equipment;  - main document number (see IEC 62023).		P
16.2.5	All enclosures, assemblies, control devices, and components are plainly identified with the same reference designation as shown in the technical documentation.		P

17	TECHNICAL DOCUMENTATION	, resi	State of the state	e e	S HILLIAND TES	di — washing tirk	P	gir
17.1	Documentation in agreed language provided.	No February	itri 🔘 Hitti	SERVERO TEST	S mirrien	ariti est	P.	HOTERERO TE

	EN 60204-1		
Clause	Requirement - Test	Result - Remark	Verdict
S" Interior		S Martin St Martin St	g grand s
17.2	Information provided with the electrical equipment include:		P
	a) A main document (parts list or list of documents);		And the second of the second o
	b) Complementary documents including: 1) a clear, comprehensive description of the		
	equipment, installation and mounting, and the connection to the electrical supply(ies); 2) electrical supply(ies) requirements;		Service of the servic
	3) information on the physical environment (for example lighting, vibration, noise levels, atmospheric		art sand sand sand
	contaminants) where appropriate; 4) overview (block) diagram(s) where appropriate;		Service Servic
	5) circuit diagram(s); 6) information (as applicable) on:		griti Santi
	programming, as necessary for use of the		Supplied Supplied
	equipment;  • sequence of operation(s);		profit State of St
	<ul> <li>frequency of inspection;</li> <li>frequency and method of functional testing;</li> <li>guidance on the adjustment,</li> </ul>		Statement State :
	maintenance, and repair, particularly of the protective		and the state of t
	devices and circuits;  • recommended spare parts list;	Service Servic	Statement State of
	<ul> <li>list of tools supplied.</li> <li>7) a description (including interconnection diagrams)</li> </ul>		or Supported Support
	of the safeguards, interlocking functions, and interlocking of guards against hazards, particularly for	A September 201	Service Servic
	machines operating in a co-ordinated manner; 8) a description of the safeguarding and of the means	and the second	art seed seed seed
	provided where it is necessary to suspend the safeguarding (for example for setting or		State of the state
	maintenance), (see 9.2.4); 9) instructions on the procedures for securing the		get get get get get
	machine for safe maintenance; (see also 17.8); 10) information on handling, transportation and		Supplement
	storage; 11) information regarding load currents, peak starting currents and permitted voltage drops, as applicable;		
	12) information on the residual risks due to the protection measures adopted, indication of whether		State of the state
	any particular training is required and specification of any necessary personal protective equipment.	and the second second	Service Service 3 and 3



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Clause	Requirement - Test	Result - Remark	Verdic
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17.3	Unless otherwise agreed between manufacturer and user:  – the documentation is in accordance with relevant parts of IEC 61082;		P P
	<ul> <li>reference designations are in accordance with relevant parts of IEC 61346;</li> <li>instructions / manuals are in accordance with IEC 62079.</li> <li>parts lists where provided are in accordance with IEC 62027, class B.</li> </ul>		
7.4	Installation documents giving all information necessary for the preliminary work of setting up the machine (including commissioning) are provided.		P
granditi St.	(In complex cases, it may be necessary to refer to the assembly drawings for details.)		period service
Santarati	The recommended position, type, and cross-sectional areas of the supply cables to be installed on are clearly indicated.		P
o de la companya de l	Data necessary for choosing the type, characteristics, rated currents, and setting of the overcurrent protective device for the supply conductors to the electrical equipment of the machine is stated (see 7.2.2).		N/A
	The size, purpose, and location of any ducts in the foundation that are to be provided by the user are detailed (see Annex B).		N/A
garden Sant	The size, type, and purpose of ducts, cable trays, or cable supports between the machine and the associated equipment that are to be provided by the user are detailed (see Annex B).		N/A
S natural Control	A diagram indicates where space is required for the removal or servicing of the electrical equipment.		N/A
Supple di	An interconnection diagram or table is provided, where it is appropriate. They give full information about all external connections.		N/A
	Where the electrical equipment is intended to be operated from more than one source of electrical supply, the interconnection diagram or table does indicate the modifications or interconnections required for the use of each supply.		N/A
17.5	Where it is necessary to facilitate the understanding of the principles of operation, an overview diagram is provided.		P
17.6	The circuit diagram shows the electrical circuits on the machine and its associated electrical equipment.		e de la companya de l



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Clause	Requirement - Test	Result - Remark	Verdict
A STATE OF THE STA	Any graphical symbol not shown in IEC 60617-DB:2001 are separately described on the diagrams or supporting documents.		P
Sprand Sprand	The symbols and identification of components and devices are consistent throughout all documents and on the machine.		P.
	Switch symbols on the electromechanical diagrams are shown with all supplies turned off (for example electricity, air, water, lubricant) and with the machine and its electrical equipment ready for a normal start.		P
San Barrello del	Conductors are identified in accordance with 13.2.	State State of the	geren Service P Service
	Characteristics relating to the function of the control devices and components which are not evident from their symbolic representation are included on the diagrams adjacent to the symbol or referenced to a footnote.		P
17.7	An operating manual detailing proper procedures for set-up and use of the electrical equipment is provided.		P
grafie States	Particular attention is given to the safety measures.		· San P part
	Where the operation of the equipment can be programmed, detailed information on methods of programming, equipment required, program verification, and additional safety procedures (where required) is given.		N/A
17.8	A maintenance manual detailing proper procedures for adjustment, servicing and preventive inspection, and repair is provided.		P
	Recommendations on maintenance/service intervals and records are part of that manual.		
Springer St.	Where methods for the verification of proper operation are provided (for example software testing programs), the use of those methods is detailed		
17.9	The parts list, where provided, comprises, as a minimum, information necessary for ordering spare or replacement parts (for example components, devices, software, test equipment, technical documentation) required for preventive or corrective maintenance including those that are recommended to be carried in stock by the user of the equipment.		P

18	VERFICATION				S HILDER					® P.
----	-------------	--	--	--	----------	--	--	--	--	------



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Clause	Requirement - Test Result	- Remark Verdic
Oldube 8	Treduit Test Tresent	Terrain Verdie
18.1	The extent of verification will be given in the dedicated product particular machine. Where there is no dedicated product stand verifications shall always include the items a), b) and f) and ma of the items c) to e):  a) verification that the electrical equipment complies with its te b) in case of protection against indirect contact by automatic d for protection by automatic disconnection shall be verified at c) insulation resistance test (see 18.3); d) voltage test (see 18.4); e) protection against residual voltage (see 18.5); f) functional tests (see 18.6).	ard for the machine, the by include one or more chnical documentation; sconnection, conditions
18.2	Verification of conditions for protection by automatic disconnection	tion of supply P
18.2.2	Test 1: Verification of the continuity of the protective bonding of	rcuit
	The resistance of each protective bonding circuit between the PE terminal and relevant points that are part of each protective bonding circuit is measured with a current between at least 0,2 A.  And the resistance measured is in the expected range according to the length, the cross sectional area and the material of the related protective bonding conductor.	N/A
State of the State	Test 2: Fault loop impedance verification and suitability of the protective device.	associated overcurrent P
S and the state of	The connections of the power supply and of the incoming external protective conductor to the PE terminal of the machine are verified by inspection.	P
	The conditions for the protection by automatic disconnection of supply in accordance with 6.3.3 and Annex A a verified by both:  1) A verification of the fault loop impedance by - calculation, or - measurement in accordance with A.4, and	P
it Santarit	2) A confirmation that the setting and characteristics of the associated overcurrent protective device are in accordance with the requirements of Annex A or table 10	Poly
18.3	Insulation resistance tests (facultative) The insulation resistance measured at 500 V d.c. between the power circuit conductors and the protective bonding circuit are not less than 1 $M\Omega$ .	P



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EN 60204-1								
Clause	Requirement - Test	Result - Remark	Verdict					
S de la								
18.4	Voltage test (facultative) Testing voltage; twice the rated supply voltage of the equipment or 1 000 V whichever is the greater With test voltage applied between the power circuit conductors and the protective bonding circuit for a period of approximately 1 s. there is no disruptive discharge occurred.		P					
18.5	Protection against residual voltages (facultative) Compliance with 6.2.4. is ensured		N/A					
18.6	Functional tests The function of circuits for electrical safety (for example earth fault detection) is insured.		P and					



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S. State State of the Control of the		EN 60204-1		, this said the said
Clause	Requirement - Test		Result - Remark	Verdict

## **DECLARATION OF NATIONAL DIFFERENCES**

## ATTACHMENT TO TEST REPORT IEC 60204-1 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES

SAFETY OF MACHINERY - ELECTRICAL EQUIPMENT OF MACHINES PART 1: GENERAL REQUIREMENTS

Differences according to...... EN 60204-1:2006 + A1:2009

Attachment Form No..... EU\_GD\_IEC60204\_1A

Attachment Originator....: Electrosuisse

Master Attachment...: 2009-11

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and the state of t	CENELEC COMMON MODIFICATIONS (EN)	Haran areas and the state of th	Р	MC TEST
1. gr <sup>d</sup>	Scope	<b>5</b>	_	
	<ul> <li>are sewing machines, units, and systems;</li> <li>NOTE 7 For sewing machines, see EN 60204-31.</li> <li>are hoisting machines.</li> <li>NOTE 8 For hoisting machines, see EN 60204-32.</li> </ul>	Starte de la companya	_	
3.	Terms and definitions	S Harry	<sub>proper</sub> P	EHERO TE
3.56	Uncontrolled stop NOTE This definition does not imply any particular state of other (for example, non- electrical) stopping devices, for example mechanical or hydraulic brakes that are outside the scope of this standard.	and the second	P of the state of	e de la companya de l
4.2	Section of equipment	and Sanding the	P	LEMENT TO
4.2.2	The electrical equipment of the machine shall satisfy the safety requirements identified by the risk assessment of the machine. Depending upon the machine, its intended use and its electrical equipment, the designer may select parts of the electrical equipment of the machine that are in compliance with EN 60439-1 and, as necessary, other relevant parts of the EN 60439 series (see also Annex F).		P	Burger Co
4.4	Physical environment and operating conditions	pa <sup>tist</sup>	9 P.	6



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o tist	EN 60204-1	gardi Salai and and an	And the second
Clause	Requirement - Test	Result - Remark	Verdict
4.4.1	The electrical equipment shall be suitable for the physical environment and operating conditions of its intended use. The requirements of 4.4.2 to 4.4.8 cover the physical environment and operating conditions of the majority of machines covered by this part of EN 60204. When special conditions apply or the limits specified are exceeded, an agreement between user and supplier (see 4.1) is recommended (see Annex B).		P
4.4.3	Electrical equipment shall be capable of operating correctly in the intended ambient air temperature. The minimum requirement for all electrical equipment is correct operation between air temperatures of +5 °C and +40 °C. For very hot environments (for example hot climates, steel mills, paper mills) and for cold environments, additional measures are recommended (see Annex B).		P
4.4.7	When equipment is subject to radiation (for example microwave, ultraviolet, lasers, X-rays), additional measures shall be taken to avoid malfunctioning of the equipment and accelerated deterioration of the insulation. A special agreement is recommended between the supplier and the user (see Annex B).		N/A
4.4.8	Undesirable effects of vibration, shock and bump (including those generated by the machine and its associated equipment and those created by the physical environment) shall be avoided by the selection of suitable equipment, by mounting it away from the machine, or by provision of anti-vibration mountings. A special agreement is recommended between the supplier and the user (see Annex B).		P
5. <sub>and a decision</sub>	Incoming supply conductor terminations and device switching off	es for disconnecting and	N/A
5.1	Add: See 17.8 for the provision of instructions for maintenance.		<u> </u>



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Clause	Requirement - Test Result - Remark	Verdict				
5.4	NOTE 2 Further information on the location and actuation of devices such as those used for the prevention of unexpected start-up is provided in EN 60447.  After the fifth paragraph, replace note 2 with: NOTE 3 The selection of a device should take into account, for example, information derived from the risk assessment, intended use and foreseeable misuse of the device. For example, the use of disconnectors, withdrawable fuse links					
9	Control circuits and control functions	State P State				
9.2.6.3	Enabling control (see also 10.9) is a manually activated control function interlock that:	_				
Supplier of the supplier of th	a) when activated allows a machine operation to be initiated by a separate start control	N/A				
Spanis Spanis	b) when de-activated  – initiates a stop function in accordance with 9.2.5.3, and  – prevents initiation of machine operation.	N/A				
	Enabling control shall be so arranged as to minimize the possibility of defeating, for example by requiring the de-activation of the enabling control device before machine operation may be reinitiated. It should not be possible to defeat the enabling function by simple means.	N/A				
9.2.7.3	Stop:					
	Cableless control stations shall include a separate and clearly identifiable means to initiate the stop function of the machine or of all the operations that can cause a hazardous situation. The actuating means to initiate this stop function shall not be marked or labelled as an emergency stop device (see10.7).	N/A				
10.	Operator interface and machine-mounted control devices	N/A				



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11.5711		rage 32 or 32	110202412233129-1E1
orter autorite the	Service Signature September 1	EN 60204-1	
Clause	Requirement - Test		Result - Remark Verdict

	C	olour	Meaning	Explanation	Examples of application	1
	RED		Emergency	Actuate in the event of a hazardous situation or emergency	Emergency stop Initiation of emergency function (see also 10.2.1)	general to the state of the sta
	YELLOV	V	Abnormal	Actuate in the event of an abnormal condition	Intervention to suppress abnormal condition Intervention to restart an interrupted automatic cycle	S. Harri
	BLUE		Mandatory	Actuate for a condition requiring mandatory action	Reset function	- Interest
	GREEN		Normal	Actuate to initiate normal conditions	(See 10.2.1)	
	WHITE				START/ON (preferred) STOP/OFF	Mark Life.
	GREY		No specific meaning assigned	For general initiation of functions except for emergency stop	START/ON STOP/OFF	
	BLACK				START/ON STOP/OFF (preferred)	ist.
Haladalla (	- 4					and the state of t
	Conduc	ctors ar	nd cables			idi .
8	Constru			of conductor wire, conduct	or bar systems and slip-	3""
grander tier Standard teer	covers underfloof the b	or cove oor duc onding	er plates of met cts. Where meta	shall include the al enclosures or al hinges form a part intinuity shall be		artin Sandardin
Margaran ac 127	Technic	cal doc	umentation		State of the State	gregorie State
September 1	3) infor exampl	mation e lightii	be provided on the physica ng, vibration, at where appropr			Street Street
S Harrieto tri	Verifica	tion	ga <sup>rti</sup> Sagaran antici		Supplied Sup	Manager terr
State	For test measur 61557	ts in ac ing equ series i	aragraph) cordance with religious with religious architecture with the contraction of the cordance of the cordance with the cordance of the co	ordance with the EN		at the state of th



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office Springer and the second		EN 60204-1		
Clause	Requirement - Test		Result - Remark	Verdict
8 /	_ HETT	S di pari		SHERO S

ZA	ANNEX ZA, Normative references to IEC standards (normative)	gardel Pi gardel
	Normative references to international publications with their corresponding European publications  The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.  NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.	_

ZZ	ANNEX ZZ, Essential requirements EC directives (informative)	P
	Coverage of Essential Requirements of EC Directives This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and within its scope the standard covers only the following essential requirements out of those given in Annex I of the EC Directive 98/37/EC:	_
	- 1.1.2 - 1.2 - 1.5.1 - 1.5.4 - 1.6.3 (for isolation of electrical supplies of machinery)	
September 1	<ul> <li>- 1.6.4 (for access to electrical equipment)</li> <li>- 1.7.0</li> <li>- 1.7.1</li> <li>- 1.7.2 (for residual risks of an electrical nature)</li> <li>- 1.7.4(c)</li> </ul>	
er Sparker	Compliance with this standard provides one means of conformity with the specified essential requirements of the Directive concerned.	
State of the state	WARNING: Other requirements and other EC Directives may be applicable to the products falling within the scope of this standard.	

	EN ISO 12100:201	0 10 10 10 10 10 10 10 10 10 10 10 10 10	
Clause	Requirement + Test	Result - Remark	Verdict
6	Risk reduction		
6.1	General	And San And San In	
	The objective of risk rduction can be achieved by the elimination of hazards, or by separately or simultaneously reducing each of the two elements that determine the associated risk: -severity of harm from the hazard under consideration -probability of occurrence of that harm All protective measures intended for reaching this objective shall be applied in the following sequence, referred to as the three-step method(see also Figures 1 and 2)		P
6.2	Inherently safe design measures		4 3 /
6.2.1	General		_
	Inherently safe design measures are the first and most important step in the risk reduction process because protective measures inherent to the characteristics of the machine are likely to remain effective, whereas experience has shown that even well-designed safeguarding may fail or be violated and information for use may not be followed.		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.  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
6.2	Consideration of geometrical factors and physical aspects		\$ <u>-</u>
6.2.2.1	Geometrical factors such factors include the following.		



Clause «	Requirement + Test	Result - Remark	Verdict
Clause	a) The form of machinery is designed to maximize direct visibility of the working areas and hazard zones from the control position—reducing blind spots, for example—and choosing and locating means of indirect vision where necessary(mirrors, etc.) so as to take into account the characteristics of humanvision, particularly when safe operation requires permanent direct control by the operator, for example: -the travelling and working area of mobile machines; -the zone of movement of lifted loads or of the carrier of machinery for lifting persons: -the area of contact of the tool of a hand-held or hand-guided machine with the material being worked. The design of the machine shall be such that, from the main control position, the operator is	Result - Remark	Verdict
	able to ensure that there are no exposed persons in the danger zones.  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
	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 angels, 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
Salar	d) The form of the machine is designed so as to achieve a suitable working position and provide accessible manual controls (actuators).		P
5.2.2.2	Physical aspects	1 8" 1 8" 1 " I	-
Bulleting in	Such aspects include the following:		-
getti Sarahari	a) limiting the actuating force to a sufficiently low value so that the actuated part does not generate a mechanical hazard;		P part
S republic to	b)limiting the mass and/or velocity of the movable elements, and hence their kinetic energy;		general Se Par

Clause	Requirement + Test	Result - Remark	Verdict
S to the	- c) limiting the emissions by acting on the		P
	characteristics of the source using measures for	Service Servic	\$ · }
	reducing	A plant of the state of the sta	September 1
	1)noise emission at source (see ISO/TR 11688-	Same and Same at the same of t	suffer that \$ lands
	1),	a Sent of the sent	9"
	2)the emission of vibration at source, such as		S Halland Tool
	redistribution or addition of mass and changes of	de la companya de la	and their
	process parameters [for example, frequency	of and the second second	and the same
	and/or amplitude of movements (for hand-held		State of the state
	and hand-guided machinery, see CR 1030-1)],	print St. print St. print Sprint	tai suturitai
	3)the emission of hazardous substances,	and the state of the state of the state of	Sun Sucha
	including the use of less hazardous substances		Market To Market To
	or dust-reducing processes (granules instead of		9 9
		and the second s	and the state of t
	powders, milling instead		9 9
	of grinding), and		6
	4)radiation emissions including, for example, avoiding the use of hazardous radiation sources,	and the state of t	all profession of the second
		And Salar And Salar And Andrew	S" gypto tot S"
	limiting the power of radiation to the lowest level	Service of the servic	6"
	sufficient for the proper functioning of the		ge <sup>rit</sup> S gi
	machine, designing the source so that the beam	and the state of t	and the state of t
	is concentrated on the target, increasing the		S many
	distance between the source and the operator or	and the state of t	Market !
	providing for remote operation of the machinery	S part St part Salar	and a
	[measures for reducing emission of non-ionizing		Service and a service of
	radiation are given in 6.3.4.5 (see also EN	and the second s	and and a state of the state of
200	12198-1 and EN 12198-3)].	and the second s	3
5.2.3	Taking into account the general technical		-
	knowledge regarding machine design This	and the second of the second o	
	general technical knowledge can be derived from		
	technical specifications for design (e.g.	and the second second	
	standards, design codes, calculation rules). These		
9	should be used to cover :	A STATE OF THE STA	
and the state of t	a) mechanical stresses such as		-
	-stress limitation by implementation of correct		Р
	calculation, construction and fastening methods	Set Set 1 Set Set	S Harris S Harris
	as regards, e.g. bolted assemblies, welded	Sent sent appears Sent sent sent	di Gui
8	assemblies		ji 9 <sup>11</sup>
	-stress limitation by overload prevention, (e.g.	of applied and applied	P
	"fusible" plugs, pressure-limiting valve, breakage		S Hitzerio S
S Hard	points, torque-limiting devices);		- A
	- avoiding fatigue in elements under variable	S print Str. print Sprint I and	P
	stresses (notably cyclic stresses);	and the second of the second o	and the state of t
S liti	- static and dynamic balancing of rotating	and the state of t	Р
	elements;		6
di mpendi	b) materials and their properties such as		-
6" <u>6</u> "	- resistance to corrosion, ageing, abrasion and		, P
	wear;		@ Harten
Street Street	- hardness, ductility, brittleness;		® P.
e pilitir			P
erici and	- homogeneity		.5"
- delité	- toxicity		Ps**
S Harden	- flammability		● P
SSE MILESPERIO	c) emission values for:		-
	- noise;		P
	- vibration;	and the second of the second o	P



,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	EN ISO 12100:201		September 1997
Clause	Requirement + Test	Result - Remark	Verdict
S. Harring	- hazardous substances;		/ A P
S <sup>P''</sup> artot	- radiation.		s P
	When the reliability of particular components or	and the second second	P. P.
	assemblies is critical for safety (e.g. ropes,	And the state of t	station & Barrellin &
	chains, lifting accessories for lifting loads or		State of Sta
	persons), stress values shall be multiplied by	, we shall shall be a state of the state of	S Harden St.
menter Statement	appropriate working coefficients.	a print strain strain	are are a second
6.2.4	Choice of an appropriate technology	S get get	-
	One or more hazards can be eliminated or risks	of the state of th	S. Barandar
	reduced by the choice of the technology to be	partir Str. Str.	S. more
and the state of t	used in certain applications, e. g.:		
	a)on machines intended for use in explosive		N/A
	atmospheres:	and the state of t	a tri
	-fully pneumatic or hydraulic control system and	Set Set Set	Suprime to Suprime
	machine actuators: -"intrinsically safe" electrical equipment (see	Salar S. Jane Salar Salar	Surger 15. Surger
	IEC60079-11)	of appearing the second	and the second
and the state of t	b)for particular products to be processed such as		// N/A
	a solvent:equipment assuring that the	St. John St.	S IN/A
	temperature will remain far below the flash point.	general Section Section 1	and the state of t
an <sup>th</sup>	c)alternative equipment to avoid high noise	and the second s	N/A
	level,e.g.:	per ser per ser ser ser ser ser ser ser ser ser s	J. S. INITA
	-electrical instead of pneumatic equipment	, Salar Martin Statement	S. S.
	- in certain conditions,water cutting instead of	1 per Salar	s September 1 months
	mechanical equipment.	ger god of the same	are the state of t
6.2.5	Applying the principle of the positive mechanical	and State of the S	-
	action		- margaret
i të Shirikë	Positive mechanical action is achieved when a	at a state of the	, P ,per
	moving mechanical component inevitably moves	of Salar and Salar and Salar	and the state of t
	another component along with it,either by direct		and the state of t
	contact or via rigid elements. An example of this	arti Sarti	S and
	positive opening operation of switching devices in	of art services	S depth definition
	an electrical circuit		Note: Sa Sun.
. <u> </u>	(see IEC 60947-5-1 and ISO 14119)	or and the second secon	, attorio de
3.2.6	Provisions for stability		
	Machines shall be designed to have sufficient	St. Japan Sp. J. Sp. J.	* P
	stability to allow them to be used safely in their	and the state of t	i Jeffer S
S Ide	specified conditions of use.		gett e gett
S returned	Factors to be taken into account include		D
	-geometry of the base;	S and S and the Sandard	Str. Japan
	-weight distribution, including loading;	gett getter it getter	ST STATE THE STATE OF
	-dynamic forces due to movements of parts of the machine itself,or of elements held by the machine	of Salar of Salar	getter Str.
	which may result in an overturning	September 11 September 19	Applied the State !
	moment;	1 and September 10 and 10 appendix	St. State of State
	-vibration	general and a second	S. S. Barriera
THIS PROCESS OF THE PARTY OF TH	-oscillations of the centre of gravity;		N/A ®
S ILLEGATOR TO'	-characteristics of the supporting surface in case		P
	of traveling or installation on different sites	di and and a state of the state	State State
	(e.g.ground conditions,slope);	it seement is appoint seeman	of the state of th
	-external forces (e.g.wind pressure,manual		p P
	forces)	The state of the s	State of Harden of
		of the second se	State of the state
		all the state of t	grayo" grayo"

Clause	Requirement + Test	Result - Remark	Verdict
Surprise Surprise	Stability shall be considered in all phases of the life of the machine,including handling, traveling,installation,use,de-commissioning and		Supplied to the supplied to th
par distriction (	dismantling.		Appeter Superior Superior
S. Francisco	Other protective measures for stability relevant to safeguarding are given in 6.3.2.6		P
5.2.7	Provision for maintainability	partir see the set of see the see	-
	When designing a machine, the following maintainability factors shall be taken into account:		
and the second	-accessibility,taking into account the environment and the human boby measurements,including the dimensions of the working clothes and tools used;		P
and the state of t	-ease of handling,taking into account human capabilities;		P
Supering in	-limitation of the number of special tools and equipment;		State P
6.2.8	Observing ergonomic principles	/ / S	S 1000
S Harrier Told S	Ergonomic principles shall be taken into account in designing machinery to reduce mental or		P of
S Harr	physical stress and strain of the operator.	Applied State	State of the state
Standing of the standing of th	These principles shall be considered when allocating functions to operator and machine(degree of automation) in the basic design.		P
Brand Spring	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)		P
	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)		P
State Statement of the	Designer's attention is especially drawn to following ergonomic aspects of machine design		S Parties -
Sentential S	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).		P
Special Specia	b) Designing machines, and more especially hand-held and mobile machines to enable them to be operated easily taking into account human effort, actuation of controls and hand, arm and		P
ger Statement and a state for	leg anatomy.  c) Limit as far as possible noise, vibration and thermal effects such as extreme temperatue		P
s agent	d) Avoid linking the operator's working rhythm to an automatic succession of cycles.		9 m P



Clause	Requirement + Test	Result - Remark	Verdict
Siduse &	e) Providing local lighting on or in the machine for the illumination of the working area and of	result - Remain	N/A
	adjusting, setting-up, and frequent maintenance zones when the design features of the machine		e Salarin grand
	and/or its guards render the ambient lighting inadequate. Flicker, dazzling, shadows and		Springer Spr
	stroboscopic effects shall be avoided if they can cause a risk. If the position of the lighting source		orth Sandri Sandri
	has to be adjusted, its location shall be such that it does not cause any risk to persons making the		Service Servic
	adjustment.		
and the state of t	f) Select, locate and identify manual controls(actuators) so that		-
	- they are clearly visible and identifiable and appropriately marked where necessary(see		Port
<b>6</b>	6.4.4)	St. J. St. St. J. St. St. St. St. St. St. St. St. St. St	San Paris San
B transfer to	- they can be safely operated without hesitation or loss of time and without ambiguity(e.g. a		P grad
	standard layout of controls reduces the possibility of error when an operator changes from a		Service Signal
	machine to another one of similar type having the same pattern of operation)	I shill be s	per se
S rates	-their location(for push-buttons) and their	September 1997	P
getti Surger	movement (for levers and handwheels) are consistent with their effect (see IEC 61310-3)		e Salaria grand
S Harden State of the State of	Where a control is designed and constructed to perform several different actions, namely where		N/A
	there is no one-to-one correspondence (e.g. keyboards), the action to be performed shall be		of the state of th
	clearly displayed and subject to confirmation where necessary.		Sandard Sandard .
9	Controls shall be so arranged that their layout,	di d	P P
	travel and resistance to operation are compatible with the action to be performed, taking account of		
S .td.	ergonomic principles.		and a second
	Constraints due to the necessary or foreseeable use of personal protective equipment(such as footwear, gloves)shall be taken into account.		
and the state of t	g)Select, design and locate indicators, dials and visual display units so that		pe <sup>rr</sup>
di gyada	-they fit within the parameters and characteristics of human perception		P,
S Hotselfer Iti	-information displayed can be detected, identified and interpreted conveniently, i.e. long lasting,	A ST	P. S
	distinct, unambiguous and understandable with respect to the operator's requirements and the intended use;		of Sand
Supplied the state of the state	-the operator is able to perceive them form the control position		P.
5.2.9	Preventing electrical hazard		<i>-</i>
a market and	For the design of the electrical equipment of machines IEC 60201-1 gives general provisions, especially in clause 6 for protection against		of P

Clause 🧬	Requirement + Test	Result - Remark	Verdict
S Herri	For requirements related to specific machines,		N/A
	see corresponding IEC standards(e.g. series of	and the same of th	g
	IEC 61029, IEC 60745, IEC 60335).	1 April 1 Sales Sa	Estate to a session of
5.2.10	Preventing and hydraulic hazards	' y' s' y s'	-
S Itel	Pneumatic and hydraulic equipment of machinery	and the second second	-
	shall be designed so that:		
as itsi	-the maximum rated pressure cannot be	/ e <sup>f</sup> / e <sup>f</sup> /	P
	exceeded in the circuits(e.g. by means of	d see the see that	LEMETO LET SHIPE
	pressure limiting devices)		\$ <sup>10</sup>
S. Halsentino	-no hazard results from pressure surges or rises,	gett Salar in Cadada i gal	** P <sub>art</sub>
	pressure losses or drops or losses of vacuum;		and the same that
Harten S	-no hazardous fluid jet or sudden hazardous	September 19 Septe	N/A
	movement of the hose (whiplash)results from	de species species appeared to the species of	agette ter
S Harrison	leakage or component failures;	St. St. of Spirit	S" S"
and spilling .	-air receivers, air reservoirs or similar	St. Jane St. J. J. St. Jane St	P
	vessels(e.g. in gas loaded accumulators)comply	September 15 Temperature St.	Applied their
property S	with the design rules for these elements;		S <sup>in'</sup> He let S <sup>in'</sup>
and the state of t	-air elements of the equipment, and especially	September 1	® <sup>note</sup> P
	pipes and hoses, be protected against harmful	S of September 1 September 1	e <sup>rlit</sup> S , d
· §	external effects;	of the state of th	and the supple
	-as far as possible, reservoirs and similar vessels		P.
	(e.g. in gas loaded accumulators)are	of the state of th	S Harrier !
	automatically depressurized when isolating the	and the second s	.610 <sup>51</sup>
	machine from its power supply (see 6.3.5.4) and,	and the second s	Andrew Test Independent
	if it is not possible, means are provided for their	, de se	And artifaction of the second
	isolation, local	and the state of the state of	antentr' .
	depressurizing and pressure indication (see also	and the second s	S /
an iti' an	ISO 14118, clause 5)	p <sup>tt</sup> s <sup>ptt</sup> pt s <sup>ptt</sup>	at selection to
	- all elements which remain under pressure after	and the second of the second o	P
	isolation of machine from its power supply be	and the second of the second o	6
	provided with clearly identified exhaust devices,	at state of the st	eta da
	and a warning label drawing attention to the		and the same that
	necessity of depressurizing those elements	Service of the servic	S de S
	before any setting or	de species species appeared to the species of	agette ter
	maintenance activity on the machine.	St. St. of Spirit	S" S"
all Shirts.	See also ISO 4413 and ISO 4414	St. Marine	er e e
5.2.11	Applying inherently safe design measures to	St. All States of the St.	-
aller S	control system		
3.2.11.1	General	ender to the state of the state	-
	The design measures of the control system shall	S of September 1 September 1	, P
	be chosen so that their safety-related	The second second second	and the state of t
	performance privides a sufficient amount of risk		S Hater A
S de la companya della companya della companya de la companya della companya dell	reduction (see ISO 13849-1 or IEC 62061)	grant grant grant grant	Shiring.
	The correct measures of the control systems can	and the state of t	P
	avoid unforeseen and potentially hazardous	The state of the state of	and the state of t
ALC HET	machine behaviour.	, per st st	and the state of t
	-an unsuitable design or modification (accidental	at the same of the same	P
Supplied to	or deliberate) of the control system logic;		<b>9</b> ji
	- a temporary or permanent defect or a failure of		P
gir ay	one or several components of the control system;		Market Bridge States
Antitude.	- a variation or a failure in the power supply of the	at September 1 September 1 September 1	P
MASHER TO	control system;		RET BEFERE
is all	- inappropriate selection, design and location of	of the state of th	N/A
	the control devices;		St. Harden



rifi Shipir	EN ISO 12100:201		
Clause	Requirement + Test	Result - Remark	Verdict
S Bright His	Typical examples of hazardous machine behaviour are:		September -
ge <sup>ter</sup> Se <sup>nter</sup>	- unintended/unexpected start-up (see ISO 14188)		, P,
Sure Sure Sure Sure Sure Sure Sure Sure	- uncontrolled speed change;		P.
gester Sussess	- failure to stop moving parts;		P
Substitute of the state of the	- dropping or ejection of a mobile part of the machine or of a workpiece clamped by the machine;		P
general and the second	- machine action resulting from inhibition (defeating or failure) of protective devices		# 8 P 8"
Sandard Sandard	In order to prevent hazardoues machine behaviour and to achieve safety functions, the design of control systems shall comply with the principles and methods presented in this		P
S and the state of	subclause 6.2.11 and in 6.2.12.  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).		P
e de la companya de l	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;		*P*
Sand Sand	-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)		P
	-clear display of the faults;		Port
grandi Sal	-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)		P
September S	-maintained stop commands (e.g. interlock) to prevent restarting that could result in dangerous machine behaviour (see ISO 14118:2000,figure 1)		P
Sandaria	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.		N/A
general separate	The different zones shall be clearly defined and it shall be obvious which parts of the machine belong to which zone.		N/A



Clause	Requirement + Test	Result - Remark	Verdict
Siddee 5	Likewise it shall be obvious which control devices	Tree of the state	N/A
	(e.g. emergency stop devices, supply	, and the state of	SIN/A
	disconnecting devices) and/or protective devices	1 per september 1	S AMERICA A MARKET
	belong to which zone.	ger and german and ger	S Japan Lair Bank
Statement State	The interfaces between zones shall be designed		N/A
	such that no function in one zone creates	of it seems it seems is	and the state of t
	hazards in another zone which has been stopped	and and a second	State
	for an intervention.		and the second
and spirite to	Control systems shall be designed to limit the	di Salah di Salah	∞ N/A
	movements of parts of the machinery, the	or and specific significant si	and the second section of the sectio
	machine itself, or workpieces and/or loads held	the state of the s	Settle Settle Settle Se
	by the machinery, to the safe design parameters		r Share Shrake
	(e.g. range, speed, acceleration, deceleration,	and the second of the second	and the same of th
	load capacity). Allowance shall be made for	Start	All Sir Sir
and the state of t	dynamic effects (e.g. the swinging of loads).	Set of the	
	For example:		
	-the traveling speed of mobile pedestrian	of Salah in Salah	N/A
	controlled machinery other than remote-	September 19 Septe	graph tot
	controlled shall be compatible with walking	S of appearing the same of the	
<u> </u>	speed.	y de la companya de l	Start Start
	-the range, speed, acceleration and deceleration		N/A
	of movements of the person-carrier and carrying	en e	groffer Spragger ;
	vehicle for lifting persons shall be limited to non-	4 de	Senter to the se
	hazardous values, taking into account the total	and the second second	September 1997 September 1997
Januar Hart	reaction time of the operator and the machine.	and the second s	see NI/A
	-the range of movements of parts of machinery		N/A
	for lifting loads shall be kept within specified limits.	and the state of t	S Harant
and the state of t	When machinery is designed to use	to appear to the second	N/A
	synchronously different elements which can also	and the state of t	A STATE OF THE STA
	be used independently the control system shall	And the state of t	di supplici
	be designed to prevent risks due to lack of	a part of the state of the stat	State State
	synchronization.	are again strength	y and a state of the state of t
5.211.2	Starting of internal power source/switching on an		_
augustus Tata	external power supply.	State	.ma feet
St. State Line	The starting of an internal power source or		P
	switching-on of an external power supply shall	Service Service Service	State of Sta
	not result in a hazardous situation. For example:	of appearing the second of the	si Susain
	-starting the internal combustion engine shall not	and the second second	a tot
	lead to movement of a mobile machine;	and the state of t	Supplier Co.
	-connection to mains electricity supply shall not	and the second s	State of Sta
	result in the starting of working parts of a	and the state of t	The Contraction of
	machine. See EN 60204-1, 7.5 (see also	and the state of t	di Santanan Sa
S Harrier	Annexes A and B).	" of god a	The state of the s
3.2.11.3	Starting/stopping of a mechanism	1 pt at a	-
	The primary action for starting or accelerating the	7 / 6 / / 6	P
	movement of a mechanism should be performed	A St. At. St. A.	Je S
	by Page from state 0 to state 1(if state 1		Supplied Supplied
- Cartin	represents the highest energy state)		S profesion see
	The primary action for stopping or slowing down	of setting the setting of the settin	P. P.
	should be performed by removal or reduction of	d Settle at a settle	ALERTH ST.
	voltage or fluid pressure, or, if binary logic	The state of the s	and the state of t
	elements are considered, by Page from state 1 to	the state of the s	Str. Martin Soliti
	0 (if state 1 represents the highest energy state).	Japan San San San San San San San San San S	St. The St. St. St.

Clause 🧳	Requirement + Test	Result - Remark	Verdict
	When, in order for the operator to maintain permanent control of deceleration, this principle not observed(e.g. a hydraulic braking vice of a self-propelled mobile machine),the machine shall be equipped with a means of slowing and stopping in case of failure of the main braking system		P
6.2.11.4	Restart after power interruption	of Specific and Sp	
	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).		
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:		P
	-the stopping function of the machinery shall remain;		e P
	-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);		P
State of the state	-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		P
5.2.11.6	Use of automatic monitoring		<u>-</u>
	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		P
and the state of t	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.		P
State	In either case, the protective measure can be initiated immediately or delayed until a specific event occurs (e.g. the beginning of the machine cycle) The protective measures may be, e.g.:		P
Statement of St.	-the stopping of the hazardous process;		P Special P
Spatistic Control	-preventing the re-start of this process after the first stop following the failure;		P <sup>a</sup>
J. E. S.	-the triggering of an alarm		N/A
6.2.11.7	Safety functions implemented by programmable electronic control systems	and the second second	P ST P

Clause 🦿	Requirement + Test	Result - Remark	Verdic
B. Harring Co.	A control system including programmable	A STATE OF THE STA	P
	electronic equipment(e.g. programmable	, Start Start	S
	controllers)can be used to implement safety	A partie and service and servi	de Santiero I serie
	functions machinery	A Service Serv	at all the state of the state o
S rate	equipment(e.g. programmable controllers)	A State of the state of	P
	can be used to implement safety functions		S International State State
	machinery	dertit Sentre	S. Application
, and	The design of the programmable electronic		/P
	control system shall be such that the probability	in section in section in	ateritar Sp.
	of random hardware failures and the likelihood of	getti green ti green	S Supple of Supple Supple
	systematic failures that can adversely affect the	de la companya de la	St. Mortel Who the
	performance of the	Supplied the Supplied S	planting of State of
	safety—related control function(s)are sufficiently	of agents agents Sand	ger and a second
Strate S	low s s s s		and the state of t
	Where a programmable electronic control system	St. Jan Salar J. Salar J.	* / P
	performs a monitoring function, the system	S and S and the state of the st	d Japan
	behaviour on detection of a fault shall be		green St.
	considered(see also IEC 6I 508 series for further	Salaria S.	, september 1
_ Harter 177	guidance)		
	The programmable electronic control system	yer and a second of the second	8 m P.//
	should be installed and validated to ensure that	and Statement it and appropriate St.	and the state of t
	the specified performance(e.g. safety integrity	the second of th	Martin State ;
	level(SIL)in IEC 6I 508 series)for each safety function has been achieved	1 de appendix appendix	September 1
§*	Validation comprises testing an analysis(e.g.		· · · · · · · · · · · · · · · · · · ·
	static,dynamic or failure analysis)to show that all	Suppose Suppos	Marketin Statement
	parts interact correctly to perform the safety	and the state of t	Salar Salar
	function and that unintended functions do not	and the state of t	S Harden
	occur	to appear of the same	general state of the state of t
.2.11.7.2	Hardware aspects		de de la companya de
- supported	The hardware(including e.g. sensors,		® / / P /
	actuators,logic solvers)shall be selected	at seem a seem as a seem a	State of State of
	(and/or designed)and installed to meet both the	and the state of t	Actif Spanish Spanish
	functional and performance requirements of the		
	safety function(s)to be performed,	Strate St	grand State State
	in particular,by means of:	Sand Sand Sandard St. Sandard	Super
§	-architectural constraints(e.g. the configuration of	St. Japan S Japan	e Per
	the system, its ability to tolerate faults, its	ti attache	against Superior
	behaviour on detection of a fault):	A AMERICAN ST. AMERICAN ST.	and Salarin S
S and the state of	-selecting (and/or designing) equipment and		of R
	devices with an appropriate probability of	getter State of the State of th	State of State of
	dangerous random hardware failure;	a standard St. St. St.	artiful Supplier
3. <sup>th</sup>	Incorporating measures and techniques within	A STATE OF THE STA	P.
	the hardware to avoid systematic failures and	grapher garden	S attention to
to' Statute	control systematic faults.		er gange i stratege
.2.11.7.3	Software aspects	y get get	,
S Harry He life!	The software (incfuding internal operating	A ST AND ST AND ST	P
	software(or system sofiware) and application	" S" ATT ST	and the state of t
	software) shall be designed so as to satisfy the	and the second s	and the state of t
	performance specification for the safety functions	of State State State State State	yr. S and a special state of the special state of t
S Halandary S	(see also IEC 61508-3)	de Service de Constitution de la	attended to Str.
	Marie Parker and Comment of the Comm	A 1980 - 1980	\$
a Hillstein C.	Application software Application software should not be re-	garti 🚭 gir gardi g	N/A

Clause 🧬	Requirement + Test	Result - Remark	Verdict
Briefly Co. C. C.	This may be achieved by use of embedded		N/A
	software in a non re-programmable memory (e.g.	Set of Section 1	, 47.2 X
	micro-controller, application specific integrated	1 1 9 1 1	A Section 10 distribution of support
	circuit (ASIC)	ger and Section 11 Section	at all and the second s
S Harange Tark	When the application requires reprogramming by	and State of the S	N/A
	the user, the access o the software dealing with	the second second second	and the state of t
	safety functions should be restricted e.g. by :	and the second of the second	age of the second
	-locks;	of setting the setting of the settin	and the second
and the state of t	-Pwords for the authorized persons	in Section in Section 2	ge <sup>ter</sup> S <sup>ee</sup>
2.11.8	Principles relating to manual control	At Setting	
	a)Manual control devices shall be designed and	di gitti salah in adalah i	® P
	located according to the relevant ergonomic		Se Sur Sur
in the	principles given in 6.2.8	e parti parti sette di septembre	The state of the s
	b)A stop control device shall be placed near each	St. St. Spirit Spirit	Per
	start control device. Where the start /stop	State of the state of	Str. Str.
	function is performed by means of a hold-to-run	and Salar it and	and the state of t
	control, a separate stop control device shali be	per ser per series and a period of	S" State It's State
	provided when a risk can	Service Servic	gere ter
	result from the hold-to-run control device failing to	S and Sandard S	g getti
ii _iii	deliver a stop command when released.		S <sup>r</sup> Jeff D
	c) Manual controls shall be located out of reach of the danger zones (see IEC 61310-3), except	and Same and Same	Ser P
		, grand in a property of	grant :
	for certain controls where, of necessity, they are located within a	and the second of the second o	and the same of th
	danger zone, such as emergency stop or teach	g general and a good of the second of the se	Salar Britis Branden
	pendant.	and the state of t	ro' gran
Japan Paris	d)Whhenever possible. control devices and		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
	control positions shall be located so that the		S Hard
	operator is able to observe the working area or	the second of th	Barrett Santager
	hazard zone.	and the state of t	Burney State of the State of th
S. Salata Lin	The driver of a ride-on mobile machine shall be	to the state of th	N/A
	able to actuate all control devices required to	A ST AND ST AND ST	State State
	operate the machine from the driving position,	and the state of t	State State of the
	except for functions which can be controlled more		
and other transfer of the state	safely from other positions.		general Statement
S USANING TEL	On machinery intended for lifting persons,	Set of the second secon	N/A
	controls for lifting and lowering and, if	State of the state	State No. 12 State
	appropriate, for moving the carrier, shall		Super
	generally be located in the carrier.	Capture St. State State	Mariet Superior S
	If safe operation requires controls to be situated	S A SAME ST AND S	general de la la
	outside the carrier, the operator in the carrier	The state of the s	Supple Company
	shall be provided with the means of preventing	a september of the september of	S Hotelston
	hazardous movements.		and the second
	e) if it is possible to start the same hazardous	S Special Spec	N/A
	element by means of several controls, the control	and the second of the second of	September 1
	circuit shall be so arranged that only one control	F. Special Spe	tri autorina it. g.m.
	is effective at a given time. This applies	and See and Section of Section	and the second
	especially to machines which can be manually	eld Set Martin Statement	S. Id
	controlled unit (teach pendant, for instance), with	and the second of the second	and the state of t
	which the operator may enter danger zones.	of the second se	a set of the set of th
	f) Control actuators shall be designed or guarded	and the second of the second	gen P
	so that their effect, where a risk is involved, cannot occur without intentional operation (see	arti Santi	appeter St. Statement St. Line
	T CADUOL OCCUL WILDOU INTENTIONAL ODERATION (SEE		P. C.



Clause 🦪	Requirement + Test	Result - Remark	Verdict
	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.		P
Service Servic	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.		P
And Sund	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)		N/A
5.2.11.9	Control mode for setting, teaching, process changeover, fault-finding, cleaning or maintenance		N/A
	Where, for setting, teaching, process changeover, fault-finding, cleaning or maintenance of machinery, a guard has to 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		N/A
€ Paragraph	simultaneously:		St. pt.
storeti Statella	-disables all other control modes;	petit settlement of the settle	N/A
	-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;		N/A
And the state of t	-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)		N/A
	Prevents any operation of hazardous functions by voluntary or involuntary action on the machine's sensors.		% N/A
S. S. Shipping City	This control mode shall be associated with one or more of following measures:	9/1///	N/A
Burner of the state of the stat	-restriction of access to the danger zone as far as possible.		N/A
, rii Suntun ii	-emergency stop control within immediate reach of the operator;		N/A
Supering the S	Portable control unit(teach pendant)and/or local controls allowing sight of the controlled elements.(see IEC60204-1:9.2.4)		N/A
5.2.11.10	Selection of control and operating modes	arti geter i geteri	©

lause	Requirement + Test	Result - Remark	Verdict
REAL STATE OF THE	If machinery has been designed and built to allow		N/A
	for its use in several control or operating modes	' ' ' ' ' ' '	SIN/A
	requiring different protective	1 det See de la Company	September 1
	measures and /or work procedures(e.g. to allow	get and a get a	S REGIST & Intern
	for adjustment, setting, maintenance,	a September of Sep	getter State
	inspection),it shall be fitted with a mode selector		and the second
	which can be locked in each position.	de la companya de la	S and the state of
Aldi Sur	Each position of the selector shall be clearly		N/A
	identifiable and shall exclusively allow one control	and the state of t	AN/A
	or operating mode.	and the second second second second second	gen grant de
S Hills.	The selector may be replaced by another		N/A
	selection means which restricts the use of certain	or grant Str. I Str.	IN/A
	functions of the machinery to certain categories		
	of operators(e.g. access codes for certain	Supplied Supplied St. Supplied	AT THE SHOPPER SHOPPER
	numerically controlled functions).	and the second second second	art and a
.211.11	Applying measures achieve electromagnetic		E Part
.211.11		and the state of the state of	_
ill.	Compatibility(EMC)  For guidance on electromagnetic		δ1/A
	compatibility, see IEC60204-1, and	Service Service in	N/A
	IEC61000-6 series	S' start Start Start Start	, and the state of
.2.11.12		y grid grid grid grid grid grid grid grid	St. let be
.2.11.12	Provision of diagnostic systems to aid	and Sandard and and and and and and and and and an	-
Harris Rev.	fault-finding		NI/A
	Diagnostic systems to aid fault finding should be	1 de april d	N/A
	included in the control system so that there is no	Branch St. Market St. Market	Salar Printer
0.40	need to disable any protective measures	and the second s	di Jeff '
.2.12	Minimizing the probability of failure of safety		-
0.40.4	functions		No. of the last of
.2.12.1	General		-
	Safety of machinery is not only dependent on the	State	P**
	reliability of the control systems but also on the	and the second second second	yeller is and the
	reliability of all parts of the machine. The	gardi Start gardi Starter id	Superior Superior
	continued operation of the safety functions is	of garden self self	Jeto III Jeto III
	essential for the safe use of the machine. This	and the state of t	9 9 g
0.40.0	can be achieved by:	The state of the s	. de la company
.2.12.2	Use of reliable components		
	"Reliable component" means components which	and the state of t	P
	are capable of withstanding all disturbances and	and the state of t	S Japanes Prince S
	stresses associated with the usage of the	and server and server as a proofer	S" grant S"
	equipment in the conditions of intended use	September 19 Contraction of the	and the state of t
	(including the environmental conditions), for the	S at Sales a part S	gett & get
	period of time or the probability of operations	and the state of t	Serve The Property of the Control of
	fixed for the use, with a low probability of failures	1 6 1 1 1 1	er Suran
	generating a hazardous malfunctioning of the	of the state of th	granti Surgeria S
	machine. Components shall be selected taking		Salar and
	into account all factors mentioned above(see also	and the state of t	Salar in angelei
0/40.0	6.213	, h <sub>i</sub> , e <sub>t</sub> , h	and the state of t
.2.12.3	Use of oriented failure mode components	1 5 pt of p	-
	"Oriented failure mode" components or systems	er er er	N/A
	are those in which the predominant failure mode	gette Setter and Setter	appropries.
	is known in advance and which can be used so	of Service and Service at the service of	Superior Super
	that such a failure leads to a non-hazardous	di Salai	parties to the state of the sta
and the latest desired to the latest desired	alteration of the machine function	The second of th	de la
	Programa i de la compania del compania de la compania del compania de la compania del compania de la compania del compania de la compania del compania d	10 m	N/A
	The use of such components should always be considered particularly in cases where	and the state of t	N/A

Requirement + Test  Duplication(or redundancy)of components or subsystems	Result - Remark	Verdict
	l'and the second of the second	N1/A
	Service Servic	N/A
n the design of safety-related parts of the	and the second second	N/A
machine, duplication(or redundancy) of	y part of any	arti
components may be used so that if one	and the same and the same	A STATE OF STATE OF
component fails, another component( or other		State of
	a property See See See See	and the state of t
	St. St. St. St. St.	iti antimir si
		N/A
	at the second se	S IN/A
	and the second s	, Salaring Supplied .
		a de la contra
	St. St. J. St.	≤ N/A
han the expected lifetime of the components.		and the Sund and
Diversity of design and/or technology can be	6 / 6/ /	N/A
used to avoid common cause failures (e.g. from	of soft of addition to the	S Hall
	September 19 Contraction of the	and the state of t
	S de la constant de l	
	and the second of the second	<u>-</u>
		P
	· September of the september of	gr F,
	1 de la Carteria del Carteria de la Carteria del Carteria de la Carteria del Carteria de la Carteria del Carteria de la Carter	S. Santaria I start
	see and see a	S Santa Late Santa
This applies to power systems (operative part) as	at St. And St.	P
well as to control systems, to safety functions as		Start Start
well as to other functions of machinery.	and the state of t	S AND TO A
	t Start Start Start Start	P
		g <sup>2</sup> 6
	garder Seath and Seathern in	P grade
	of the second se	, and the state of
	and and some some	north Spinister Spinister
	Service Service	S. arter
unloading (removal)	of specific strains	
operations /		, and the second
	S of a state of the state of th	series P
	and the state of t	State State State
	and the second second	er Suren
		State :
	1 and Supplied to appendix	Sept.
		P P
	a set of set of	petri Sura
	The second of th	Salar in
Mechanization can be achieved, e.g. by feeding	de la companya della companya della companya de la companya della	. Р
slides, push rods, hand-operated indexing tables.	to state of the st	State State State
While automatic feeding and removal devices	a set a set a	garage P
nave much to offer in preventing accidents to	art of the state of	ger of Supplement of the suppl
	of the second of	Star British Starter
	Diversity of design and/or technology can be used to avoid common cause failures (e.g. from electromagnetic disturbance) or common mode ailures.  Limiting exposure to hazards through reliability of quipment increased reliability of all component parts of machinery reduces the frequency of incidents requiring rectification, thereby reducing exposure to hazards.  This applies to power systems (operative part) as well as to control systems, to safety functions as well as to other functions of machinery.  Safety-critical components (as e.g. certain sensors) with known reliability shall be used.  The elements of guards and of protective services shall be particularly reliable, as their ailure can expose persons to hazards, and also as poor reliability would encourage attempts to defeat them.  Limiting exposure to hazards through mechanization or automation of loading(feeding) unloading (removal) operations  Mechanization and automation of machine coading/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.  Automation can be achieved e.g. by robots, mandling devices. transfer mechanisms, air blast equipment.  Mechanization can be achieved, e.g. by feeding slides, push rods, hand-operated indexing tables.  While automatic feeding and removal devices	unction, thereby ensuring that the safety function emains available n order to allow the proper action to be initiated, proponent failure shall be preferably detected by automatic monitoring (see 6.2.1 1.6) or in some circumstances by regular inspection, provided that the inspection interval is shorter than the expected lifetime of the components. Diversity of design and/or technology can be used to avoid common cause failures (e.g. from electromagnetic disturbance) or common mode ailures.  Initing exposure to hazards through reliability of guipment noreased reliability of all component parts of machinery reduces the frequency of incidents requiring rectification, thereby reducing exposure o hazards.  This applies to power systems (operative part) as well as to control systems, to safety functions as well as to other functions of machinery. Safety-critical components (as e.g. certain sensors) with known reliability shall be used.  The elements of guards and of protective revices shall be particularly reliable, as their ailure can expose persons to hazards, and also as poor reliability would encourage attempts to defeat them.  Inimiting exposure to hazards through mechanization or automation of loading(feeding) unloading (removal) 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 o hazards at the operating points.  Automation can be achieved e.g. by robots, mandling devices. transfer mechanisms, air blast equipment.  While automatic feeding and removal devices mave much to offer in preventing accidents to machine operators, they can create danger when



Clause	Deguirement L Test	Result - Remark	Verdict
Jiause	Requirement + Test	Result - Remark	J. S. J. S.
	Care shall be taken to ensure that the use of		‴ <sub>ge</sub> rel grandP, "
	these devices does not introduce further hazards	the state of the s	S refer
	(e.g. trapping, crushing) between the devices and	and the second second	r Same and a support
	parts of the machine or workpieces/materials	, and the state of	A. Itali
Superior Superior	being processed.	A S A S	Street, Street
	Suitable safeguards (see 6.3) shall be provided if	ed Str. Agent Spirit	P P
	this cannot be ensured.	agendi Septem and September	and the state of t
	Automatic feeding and removal devices with their	of State and State at the state of the state	P
	own control systems and the control systems of	di Salai	And the state of t
	the associated machine shall be interconnected	and the second of the second	St. Market St.
	after thoroughly studying how all safety functions	er b	State
	are performed in all control and operation modes	and the second s	and the State of t
	of the whole equipment.		e de la companya de l
3.2.15	Limiting exposure to hazards through location of	State	Part
January Control of the Control of th	the setting and maintenance points outside of	Sept with appearing St. Market	S and S and
	danger zones.	Salar Salar Salar Salar	Salara Salara
ages to Second	The need for access to danger zones shall be	a state of the sta	martin Salaran Paratri
			Je ge
	minimized by locating maintenance, lubrication and setting points outside these zones.	Sett sett Setter it	Carl Market
2 2		S I S I S I S I S I S I S I S I S I S I	* s <sup>to</sup> 6' 6
5.3	Safeguarding and complementary protective	and specific and specific	€ <sup>*</sup>
9	measures		. spekering
3.3.1	General		
	Guards and protective devices shall be used to	& de	Sandar P
	protect persons whenever inherently safe design	and the state of t	y Salar in the sal
	does not reasonably make it possible either to	And the state of t	tist and the state of the state
	remove hazards or to sufliciently reduce risks.	and the special specia	and the state of t
	Complementary protective measures involving	ed State of State of	and the state of t
	additional equipment (e.g. emergency stop	ageted Superior	and the state of t
	equipment )may have to be implemented.		ord grant grant
HILLIANDE .	The different kinds of guards and protective	di Silani	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
	devices are defined in 3.27 and 3.28.	e de la companya del companya de la companya del companya de la co	Start Market Market
9	Certain safeguards may be used to avoid		®″ , P
	exposure to more than one hazard (e.g. a fixed	and the state of t	Antiri Sa antiri Santani
	guard preventing access to a zone where a		
	mechanical hazard is present being used to	Salari Salari Salari Salari	and Salari Salari
	reduce noise level and collect toxic emissions)	and the second	S min
5.3.2	Selection and implementation of guards and		And the second
J.J.Z	protective devices	and the state of t	
5.3.2.1	General		Jan 19 19 19 19 19 19 19 19 19 19 19 19 19
).J.Z. I			9 P
	This subclause gives guidelines for the selection	S de tri Santa	and E and
	and the implementation of guards and protective	and the state of t	St. Market St.
	devices the primary purpose of which is to protect	A State of S	And Salar Sa
	persons against hazard generated by moving	, and s	grand State :
	parts, according to the nature of those parts(see	and the same of th	States and the state of the sta
	figure 4)and to the need for access to the danger	and the state of t	er en
e	zone(s)	b and the state of	The state of the s
	The exact choice of a safeguard for a particular	of St. political St.	, P
	machine shall be made on the basis of the risk	id and and	and the state of t
and and an arranged to	assessment for that machine	de de la companya del companya de la companya de la companya del companya de la companya del companya de la companya de la companya de la companya de la companya del companya de la companya dela companya de la companya de la companya dela companya de la companya dela companya de la companya dela	Septe to
printe S	In selecting an appropriate safeguard for a	i Salar i alar	Po
	particular type of machinery or hazard zone, it	a series of the	atter tot.
	shall be borne in mind that a fixed guard is simple	de de la companya de	Server at the state of
	and shall be used where access of an operation	a part San Appeter San Appeter	Settler St. Settler
	(operation without any malfunction) of the	ggeterit Star godin Species	and and and an arrangements
	machinery.	St. of party	Jer 3 9 6 m

Clause	Requirement + Test	Result - Remark	Verdict
S Herri	As the need for frequency of access increase this	A ST AND ST AND ST	P
	inevitably leads to the fixed guard not being		5
	replaced	Applied Service Servic	Assets I seeks !
and a	This requires the use of an alternative protective	Y pri of it of	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
	measure (movable interlocking guard, sensitive	J Str. J. Str. J. Jan.	9
	protective equipment.)		S <sup>itt</sup> ,ti
tts' and statement	A combination of safeguards may sometimes be	and the second of the second o	// N/A
	required. For example, where, in conjunction with		Martin Superior
	a fixed guard, a mechanical loading(feeding)	a series of approximation of the series of t	S Harr
	device is used to feed a workpiece into a		er andrew
	machine, thereby removing the need for assess	of the second se	Martin Saltin St
	to the primary hazard zone, a trip device may be		A State Stat
	requiring hazard between the secondary drawing-		S HARDER
	in or shearing hazard between the mechanical	Salar Salar Market Salar Market	Sure Sure
	loading(feeding) device, when reachable, and the		general State of
S Lift	fixed guard.	St. J. Special St.	and the second
g"	Consideration shall be given enclosure of control	of self of the sel	P
	positions or intervention zones to provide	and the second second	S Harden
	combined protection against several hazards		artif
S Hall	which may include:		es specialists
	- hazards from falling or ejected objects(e.g.		P
ar Ma Hai	falling object protection structure)		Hillardin S
	- emission hazards(e.g. protection against noise,		P
i Surani	vibration, radiation , harmful substances)		A SHERO, SHERO,
	- hazards due to the environment(e.g. protection	3" Market Sant Sant Sant Sant	P P
Ringson 151	against heat, cold, foul weather)	A St. Att. St. A.	9
	- hazards due to tipping over or rolling over of		P
	machinery(e.g. roll-over or tip-over protection		at parties the
	structure)	of State of	Market State
	The design of such enclosed work		• P
	stations(e.g. cabs and cabins) shall take into	art seem a comment	ar and the second
	account ergonomic principles concerning		and the same of th
	visibility, lighting, atmospheric conditions,	Service of the servic	Superior Superior
	access, posture.	of the second se	and the state of t
3.2.2	Where access to the hazard zone is not required	Set Set it Set it Set it is	-
and strike it.	during normal operation	St. John St. John St. J	÷
	Where access to the hazard zone is not required		-
	during normal operation of the machinery,	ord State of the S	
History Its	safeguard should be selected from the following:		
	a) fixed guard (see also ISO 14120)		P.
EG . GD	b) interlocking guard with or without guard locking		P
		and Superior of the superior of the superior	San P
- Harding the	(see also 6.3.3.2.3, ISO 14119, ISO 14120); c) self-closing guard (see ISO 14120, 3.3.2)		NI/A
S Japane	d) sensitive protective equipment, e.g. electro-		N/A N/A
		general and the second of the	IN/A
	sensitive protective equipment (see IEC 61496)		S William
2 2 2	or pressure sensitive mat (see ISO 13856)		
3.2.3	Where access to the hazard zone is required	and the second second	-
idi Sulati	during normal operation		
	Where access to the hazard zone is required	S per St. J. St. J.	-
	during normal operation of the machinery , safeguards should be selected from the following:	of St. And St. A Supple	



Clause	Requirement + Test	Result - Remark	Verdict
S and S and shape of the state	a)interlocking guard with or without guard locking (see also ISO 14119, ISO 14120 and 6.3.3.2.3 of this standard);		Not appficable.
parting the S	b)sensitive protective equipment, e.g electrosensitive protective equipment (see IEC 61496)		N/A
Wildelight Co.	c)two-hand control device (see ISO 13851)		N/A
6.3.2.4	Where access to the hazard zone is required for		IN/A
0.5.2.4	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		N/A
	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.		gent Special S
getti geretekti	Such tasks shall be identified and considered in the risk assessment as parts of the use of the machine (see 5.2)		N/A
6.3.2.5	Selection and implementation of sensitive protective equipment		-
6.3.2.5.1	Setection	The state of the s	
, dif	Due to the great diversity ofthe technologies on	St. And St. And Andrews	N/A
	which their detection function is based, all types	A Same sit Same	And the state of t
	of sensitive protective equipment are far from	and the state of t	S gent it
	being equally suitable for safety applications.	it appeter a period	Series and the series are the series and the series are the series and the series are the series and the series and the series are the series and the series
Harring Co.	The following provisions are intended to		g til g til g til
	provide the designer with criteria for	S defendence S de la company d	and the State of t
	selecting, for each application, the most	And the state of t	N/A
	suitable device(s).	and the second s	State of the state
and the state of t	Types of sensitive protective equipment	A CONTRACTOR OF THE STATE OF TH	att at t
	include, e.g.:		- "
age per ceri	- light curtains;	and the state of t	N/A
State of Sta	- scanning devices as, e.g. laser scanners;	Ser and American	N/A
d	- pressure sensitive mats;		N/A
and the same	- trip bars, trip wires.	di approve the second s	N/A
Super Charles	Sensitive protective equipment can be used:		IN/A
September 197	- for tripping purposes;		N/A
yo'te' Saturda		S of the state of	N/A
	- for presence sensing;	and the state of t	
State of the state	- for both tripping and presence sensing		N/A
	- to re-initiate machine operation, a practice	· Salari Salari	N/A
iti — presidenti	which is subject to stringent conditions.		S ALLA S
	The following characteristics of the machinery, among others, can preclude the sole use of sensitive protective equipment:		N/A
S Harbert Market Company	tendency for the machinery to eject materials or component parts;		N/A
Martin Company of the	- necessity to guard against emissions (noise, radiation, dust, etc.)		N/A
rgi uppgeterto	- erratic or excessive machine stopping time;		N/A
agget to State	-inability of a machine to stop part-way through a cycle.		N/A

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EN ISO 12100:2010				
Clause	Requirement + Test	Result - Remark	Verdict	
6.3.2.5.2	Implementation		-	
e Start	consideration should be given to :	and the second s	-	
Samuel Sa	a) size, characteristics and positioning of the detection zone (see ISO 13855, which deals with the positioning of some types of sensitive protective equipment)		N/A	
Salara de la companya	b)reaction of the device to fault conditions (see IEC 61496 for electro-sensitive protective equipment)		N/A	

Children or Control	c)possibility of circumvention	N/A
	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.	N/A
general September 1	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 ;	N/A
	- 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;	N/A
	- 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 ;	N/A
of the second	-the machine cannot operate during interruption of the detection function of the sensitive protective equipment, except during muting phases;	N/A
	- the position and the shape of detection field prevents, possibly together with fixed guards, a person or part of a person from entering the hazard zone, or being present in it, without being detected.	N/A
6.3.2.5.3	Additional requirements for sensitive protective equipment when used for cycle initiation.	-

Clause s	Requirement + Test	Result - Remark	Verdict
Sidds &	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	Troductionally	Volume
	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 .		N/A
e de la companya del companya de la companya del companya de la co	Cycle initiation by sensitive protective equipment shall be subject to the following conditions:		· -
Supplied to	a)only active optoelectronic protective devices (AOPDs) complying with IEC 61496 series shall be used;		N/A
	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;		N/A
gardin Sarah	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;		N/A
Salar Salar	d) entering the sensing field of the AOPD(s) or opening interlocking guards is the only way to enter the hazard zone;		N/A
Surger of the Su	e) if there is more than one AOPD safeguarding the machine, only one of the AOPD(s) is capable of cycle re-initiation;		N/A
	f) with regard to the higher risk resulting from automatic cycle initiation, the AOPD and the associated control system comply with a higher safety-related performance than under normal conditions.		N/A
5.3.2.6	Protective measures for stability	get State at State	- A
5.0.2.U	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 :		
et appeter	- anchorage bolts;	of the state of th	®" <sub>je</sub> d P j
J. Friedrich S.	- locking devices		N/A
and additional to	- movement limiters or mechanical stops;		o N/A
	- acceleration or deceleration limiters;		N/A

			5 J
Clause	Requirement + Test	Result - Remark	Verdic
	<ul> <li>alarms warning of the approach to stability or tipping limits;</li> </ul>		N/A
.3.2.7	Other protective devices	Approximation of the state of t	, , , <u>-</u>
ac refer	When a machine requires continuous control	The state of the state of	N/A
	by the operator(e. g. mobile machines,  Dumpling making machines) 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		
general Sept	- when the operator has insufficient visibility of the hazard zone;		o N/A
THE PROPERTY OF THE PARTY OF TH	- when the operator lacks knowledge of the	st st , , ,	∞ N/A
	actual value of a safety-related parameter		S" get
	(e. g. a distance, a speed, the mass of a load, the angle of a slope)		April Spring St
Supplied of the state of the st	-when hazards may result form operation other then		N/A
8	those controlled by the operator;		- S <sup>rus</sup>
atter tel	The necessary devices include:	and the second s	-
Shiring the	- devices for limiting parameters of movement (distance, angle, velocity, acceleration)		N/A
i gund	- overloading and moment limiting devices:	and the second second	N/A
& statement to the state of the	- devices to prevent collisions or interference with other machines;		N/A
S. H. S. Harris	-device for preventing hazards to pedestrian operators of mobile machinery or other pedestrians:		N/A
Statement of the state of the s	- torque limiting devices, breakage points to prevent excessive stress of components and assemblies;		N/A
itro, @	- devices for limiting pressure. temperature;		
Mar Hall	- devices for monitoring emissions;	y per per ser per per per	N/A
S areas	- devices prevent operation in the absence of the operator at the control position;		N/A
per let.	- device to prevent lifting operations unless stabilizers are in place;		N/A
Stanting of the stanting of th	- devices to ensure that components are in a safe position before traveling;		N/A
general S	Automatic protective measures triggered by such devices which take operation of the machinery out of the control of the operator (e.g.		N/A
	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)		
.3.3	Requirements for the design of guards and protective devices		Supplied -



Clause 🦿	Requirement + Test	Result - Remark	Verdic
State of the state	Guards and protective devices shall be designed to be suitable for the intended use		P,
	taking into account mechanical and other	and the state of t	. Same of the same
	hazards involved. Guards and protective	ger and a grant	S Japan Land
	devices shall be compatible with the working	at Same and Same	And the state of t
	environment of the machine and designed so that	in the second of	S and the state of
	they cannot be easily defeated. They	arti Santa di Japan	St. State Let
	shall provide the minimum possible	t start in a start in the	oti gwal
	interference with activities during operation	at State of	and the state of t
	and other phases of machine life, in order to	att start a start	St. Jan Sandar St.
S LEPH	reduce any incentive to defeat them.	oti Santari	
general S	Guards and protective devices shall:	State of the state	, e e e e e e e e e e e e e e e e e e e
,	- be of robust construction.	the second second second	P P
Maratino S	- not give rise to any additional hazard;	Start	P
	-not be easy to by-P or render	Str. Japania Str.	P
	non-operational;		Andre Sandard St Al
S Harring to	-be located at an adequate distance from the		P P
S Helding.	danger zone (see ISO 13857 and ISO 13855).	S of S	and the state of t
and the state of t	-cause minimum obstruction to the view of the production process:		ser P
	-enable essential work to be carried out on		P.
	installation and/or replacement of tools and	1 th Saparation S	S min
	also for maintenance by allowing access only	series and the series of the series of	y 😸 dar saytir i gʻilganin
	to the area where the work has to be done, if	State of the state	age tri
	possible without the guard or protective		Start Starte
<b>S</b> **	device having to be moved;		State D
.3.3.2	For openings in the guards see ISO 13857		P
.3.3.2.1	Requirements for fixed guards Functions of guards	The state of the s	
.3.3.2.1	The functions that guards can achieve are:		- P.
- O HOLE	-prevention of access to the space enclosed by		* P
	guard and/or .	and the state of t	and Same
	-containment/capture of materials,		
	workpieces, chips, liquids which may be	Supplied Sup	and the state of t
	ejected or dropped by the machine and	Strate and the state of the sta	State of the state of
	reduction of emissions(noise, radiation,	State of the state	State State State
	hazardous substances such as dust, fumes,	of self to the sel	and the state of t
	gases)which may be generated by the	and the state of t	atteritie Statement
	machine.	S to add S and	States Cartes Si Asi
\$	Additionally, they may need to have particular	ye grand and the second	star Part
	propertied relating to electricity, temperature, fire,	d and the second	and the Same
	explosion, vibration. visibility(see ISO	The state of the s	ger gerter Starter
	14120) and operator position ergonomics(e.g.	S AND SHE	S Harden
	usability, operator's movements, posture,	and the state of t	S. Salaran
pe <sup>ld</sup> S	repetitive movements).	, the second sec	and a state of the
.3.3.2.2	Requirements for fixed guards	A STATE OF STATE OF	-
S Harring and	Fixed guards shall be securely held in place:		
	- either permanently (e.g. by welding)	and the state of t	The state of the s
	-or by means of fasteners (screws, nuts)		at appendix Sum
	making removal/opening impossible without	et St. get State	State of the state
	using tools; they should not remain closed	gett gett getter i	The state of the s
	without their fasteners (see ISO 14120)	de la company	S Add Add

Clause	Requirement + Test	Result - Remark	Verdict
Clause		Result - Remark	Verdict
	a)movable guards which provide protection	, seems of the seems of	
	against hazards generated by moving	the second of the second of	
, etc. (6)	transmission parts shall:		e
	-as far as possible remain fixed to the	September 1 Septem	P P
	machinery or other structure (generally by		AND SHAPER IN
S Harr	means of hinges or guides) when open;		
	-be interlocking guards (with guard locking		N/A
ate (St.	when necessary ) (see ISO 14119)		
	b) movable guards against hazards generated by		-
	non-transmission moving parts shall be	gardi Safet Safet Safet	Market of State of St
	designed and associated with the machine		
- Daniel Control of the Control of t	control system so that;	5	§*
	- moving parts cannot start up while they are		P
	within the operator's reach and the operator	S S S S S S S S S S S S S S S S S S S	9 9
	cannot reach moving parts once they have start		and the state of t
	up; this can be achieved by interlocking guards,	at the state of th	and the second
and the same of th	with guard locking when necessary.		St. Hell Shirt
	- they can be adjusted only by an intentional	Service of the servic	* P
to the state of th	action, such as the use of tool or a key;		arti Si di
	-they absence or failure of one of their	and the second second	8" P"
	components prevents starting of the moving		Share at St
	parts or stops them; this can be achieved by	of the state of th	getter Surgery
9" notice	automatic monitoring (see 4.11.6)		di .
5.3.3.2.4	Requirements for adjustable guards	· parti St	<u>-</u> .
	Adjustable guards may only be used where	y part of print of the	N/A
	the hazard zone cannot for operational	A ST AND STATE OF STA	Si Turney
S. T. T.	reasons be completely enclosed;	ed St. John State	general S into
S. Hari	They shall:		-
	-be designed so that the adjustment	d Str. Str. Str.	N/A
C. Harrier C.	remains fixed during a given operation		6"
Thursday.	-be readily adjustable without the use of tools;	artir Specific St.	N/A
5.3.3.2.5	Requirements for interlocking guards with a start	of the second of	N/A
	function (control guards)		Start Start
gall.	An interlocking guard with a start function may be		N/A
	used provided that	Service Servic	Shirt Shirt
s' magnification	- all requirements for interlocking guards are	St pt St	N/A
	satisfied (see ISO 14119)	St. It and the state of the sta	and the second
all profits to the second	- the cycle time of the machine is short	1 6 1 1 9 1	N/A
, triplicited	-the maximum opening time of the guard is		N/A
	present to a low value (e.g. equal to the cycle		arter di si
	time). When this time is exceeded, the	and the second s	States of States of
	hazardous function(s) cannot be initiated by	April 6th April 6th	S Hande
	the closing of the interlocking guard with a tart	and the state of t	this with the state of the stat
	function and resetting is necessary before	. Start Start Start	¥.   \$ .
	restarting the machine.		And the state of t
, a	- the dimensions or shape of the machine do	y grid State of the control of	N/A
	not allow a person, or part of a person, to stay in	at Section of Section 2 and a section of the sectio	8 147
	the hazard zone or between the hazard zone and		Aller of the state
	the guard while the guard is closed (see ISO	at and a part of	ages Tax
	14120)		Sales Sales Sales
undergraphic test	- all other guards whether fixed (removable		N/A
	type) or movable are interlocking guards;	and the same of th	INA



Clause S	Requirement + Test	Result - Remark	Verdict
S. Iti	-the interlocking device associated with	And the second second	N/A
	the interlocking guard with a start function is		gi 4/2 C
	designed in such a way – e.g. by duplication	1 and the Salahara	September 1 april
	of position detectors and use of automatic	and state of the state of the state of	orth St.
	monitoring (see 4.11.6)- that its failure cannot	at State of	Applied Super
	lead to an unintended/unexpected start-up;		St. St.
S suppli	-the guard is securely held open(e.g. by a	i all and a second	N/A
	spring or counterweight )such that it cannot	t salah i salah sa	AND THE STATE OF T
	initiate a start while falling by its own weight;	de la companya de la	and the second
6.3.3.2.6	Hazards from guards		S. I.
0.3.3.2.0	Care shall be taken to prevent hazards which		
	might be generated by:	get get street seems	<u>-</u>
up <sup>to</sup>	- the guard construction (e.g. sharp edges or		P
	corners, material);	A STATE STAT	Martin Superior C
- St. Market	- the movements of the guards (shearing or		P
	crushing zones generated by power-operated	Settle Settle Settle Settle	Superior Superior
	guards and by heavy guards which are liable to	d profession of the second	acted and applied to applie
	fall )	and the state of t	AND STATE OF THE S
6.3.3.3	Technical characteristics of protective devices		Supplier S
3.0.0.0 y	Protective devices shall be selected or		s sala s Piga
	designed and connected to the control system	And Server Server Server	di andrea
	so as to ensure correct implementation of	and State of the S	Statement State
	their safety function (s) is ensured.	S S S S S S S S S S S S S S S S S S S	St.
e life and a second	Protective devices shall be selected on the		P P
	basis of their having met the appropriate	gent gent gent great	arte agent agent agent
	product standard (for example, IEC 61496 for	at Supple	And Salar
	active optoelectronic protective devices) or		St. Butter St.
	shall be designed according to one or several of	di adamenti S	S are to
	the principles formulated in ISO 13849-1 or	t and the second	AND THE SHAPE
	IEC62061.		general survey
S stripe by	Protective devices shall be installed and	A STATE OF THE STA	P. 1
	connected to the control system so that they		State of Sta
	cannot be easily defeated.	A April Str.	Andri Salar Salar
6.3.3.4	Provisions for alternative types of safeguards.	and the second of the second	_
and profession of the contract	Provisions should be made to facilitate the	Set State of Section 1	∞ N/A
	fitting of alternative types of safeguards on	Start and the start of the star	See also see
	machinery where it is known that this fitting	Service Service Service	Super Super
	will be necessary because the work to be	di alemania de de la compania del compania del compania de la compania del compania del compania de la compania del compan	Martin Super
	done on it will vary.		
6.3.4	Safeguarding for reducing emissions	at the state of th	@ <sup>max</sup> =
6.3.4.1	General	of plan and plan and a	* 6 <sup>15</sup> -
and the State	If the measures for the reduction of emissions at	And State St	and P. a
	source mentioned in 6.2.2.2 are not	and the state of t	State of Sta
	adequate, the machine shall be provided with	S S S S S S S S S S S S S S S S S S S	September 5
	additional protective measures (see 6.3.4.2 to	A partir Salar and Salar	ar September 1 meteories
	6.3.4.5).	per service se	o supported by party
3.3.4.	Noise		
a paragraphic	Additional protective measures include, for	of the settled of the settled of	pri S Pri
	example:	1 all 3 pl	St. Stephen
	-enclosures (see ISO 15667)	and September 19 The September 19 September	get to sent the sent to the se
	-screens fitted to the machine;	The state of the s	and the state of t
	-silencers (see ISO 14163)		State of Sta
5.3.4.3	Vibration		THE ST. ST.

as its amount	EN ISO 12100:20	JIO / 6 /	Sales Sales Co.
Clause	Requirement + Test	Result - Remark	Verdict
e de la companya de l	Additional protective measures include, for example, damping devices for vibration isolation between the source and the exposed person such as resilient mounting or		P
S Harry State Stat	suspended seats.		and the second
Stage Contraction	For measures for vibration isolation of stationary industrial machinery see EN 1299		*P*
6.3.4.4	Hazardous substances		_
S. Barrer	Additional protective measures include, for example:		9
	-encapsulation of the machine (enclosure with negative pressure);		N/A
, this	- local exhaust ventilation with filtration.	A STATE OF S	N/A
Rate Market	- wetting with liquids;	St. St. it State	N/A
i Santa	- special ventilation in the area of the machine (air curtains, cabins for operators)		N/A
6.3.4.5	Radiation		-
S attention of the state of the	Additional protective measures include, for example:		Supplied -
Acting Same	- use of filtering and absorption;		⊚″ N/A
and the state of t	- use of attenuating screens or guards	A September 1 September 1	.∕ s N/A .√
6.3.5	Complementary protective measures	St. Jan. St. Jan. St.	arter -
6.3.5.1	General	4 2 Jan 19 19 19 19 19 19 19 19 19 19 19 19 19	S rates
	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		
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:		
Shiphing to Sh	-the actuators shall be clearly identifiable, clearly visible and readily accessible		e P
	-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;		P
general state	-the emergency stop control shall trigger or permit the triggering of certain safeguard movements where necessary.		Po



	EN ISO 12100:201		Salar Salar
Clause	Requirement + Test	Result - Remark	Verdict
	Once active operation of the emergency stop		P
	device has ceased following an emergency	and the state of t	Salaria de la companya del companya del companya de la companya de
	stop command, the effect of this command	and the state of t	de Salar de la companion
and find	shall be sustained until it is rest.	Appendix Start Start	,diabselle. }
	This reset shall be possible only at that	and the second second	P
	location where the emergency stop command		- Harden S. Ind.
	has been initiated. The reset of the device	general State of Stat	a and a second
	shall not restart the machinery, but only permit	de Sagar	gette grant grant
	restarting.	di Santari	gette tit.
i utentio in	More details for the design and selection of	and the second of the second o	* _/ P.*
	electrical components and elements to	di Santa di Maria	e de la companya de l
	achieve the emergency stop function are	or and the state of the state o	And State of the S
	provided in EN 60204 series.		
6.3.5.3	Measures for the escape and rescue of	Self Self : Jeff Se	Jerry -
agent lock	trapped persons-	Set and appearing the set of the	Super la
	Measures for the escape and rescue of	St. S. John St. John	6"
	trapped persons may consist e.g. of:	de andre St. April Specific	and the same of th
July 18 to 1	-escape routes and shelters in installations		N/A
	generating operator-trapping hazards	Se getting and the second	S IN/A
Str. Shringer	-arrangements for moving some elements by	S of S of S	N/A
	hand, after an emergency stop	genti San	IN/A
State of	-arrangements for reversing the movement of	and the second s	N/A
	some elements	s self	IN/A
di lateratio		t in grand a particular	N/A
g <sup>i</sup>	- anchorage points for descender devices;		10 2 2
	-means of communication to enable trapped	Supplied to the state of the st	N/A
0.0.5.4	operators to call for help		s <sup>tt</sup> // /
6.3.5.4	Measures for isolation and energy dissipation		Gudin -
	Especially with regard to their maintenance	dr	
	and repair, machines shall be equipped with	de Santonia de San	, tit
	the technical means to achieve the isolation		S. Harder
	from power supply(ies) and dissipation of	getter Start Start Start	
	stored energy as a result of following actions:	de de la companya de	*
	a) isolating(disconnecting,separating)the	Service of the servic	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
	machine(or defined parts of the machine)	grand and the state of the stat	and the state of t
S Harrier	from all power supplies;		S S
	b) locking (or otherwise securing ) all the	St. photo St. it States	* / P /
nter numbered	isolating units in the isolating position;	S and Supplied to the supplied to	S Helpfred S
	dissipating or , if this is not possible or	of State of State of	PP
	practicable, restraining (containing) any	Salari di Japan S	ggeter Spirit
	stored energy which may give rise to a	S de appendix	Set of the
,ti	hazard;		Super Super
	verifying, by means of a safe working	i grander since	and P. and
	procedure, that the actions taken according to	M. T. James S. James S.	Arti Salari
	a), b) and c) above have produced the desired	and the second second	S parent
get this	effect.	The state of the s	ger and an analysis of supplier of
an little and	See ISO 14118, clause 5 and EN 60204-1:	Agenti Sept Liti September	, , P
	5.5 and 5.6	and the state of t	S. S. S. S.
6.3.5.5	Provisions for easy and safe handling of		P
and appendix	machines and their heavy component parts	att and the state of the state	St. Market
January S.	Machines and their component parts which	of State of	P
	cannot be moved or transported by hand shall be	a septim septim septim	and the state of t
	provided or capable of being provided with		Start National State of
	suitable attachment devices for transport by	and the second second	State St. St.
	means of lifting gear.	al artir 6th at author	and the state of t

<u> </u>	EN ISO 12100:20	Tal Age and the state of the st	5 S. C.
Clause	Requirement + Test	Result - Remark	Verdict
S Helding	These attachments may be, among others,		P,
	standardized lifting appliances with slings,	1 de appendix s	Same P
	hooks,eyebolts, or tapped holes for appliance fixing;		S S AN A BOUND OF A STATE OF S
S Harry Harris	appliances for automatic grabbing with a	and the state of t	Р
S. Pariste	lifting hook when attachment is not possible from the ground.		Sand American
Statement of the state of the s	guiding grooves for machines to be transported by a fork truck;		N/A
S Harden	lifting gear and appliances integrated into the machine.		N/A
Standard of the standard of th	Parts of machinery which can be removed manually in operation shall be provided with means for their safe removal and		P &
.3.5.6	replacement; (See also 6.4.4c item 3).		State State
.5.5.0	Measures for safe access to machinery  Machinery shall be so designed as to enable		
	operation and all routine tasks relating to setting and/or maintenance, to be carried out,as far as possible, by a person remaining at ground level.		
Mark Till	Where this is not possible, machines shall	Selection of the select	N/A
	have built-in platforms, stairs or other facilities	and the state of t	S street, the
	to provide safe access for those tasks ,but		e de la companya del companya de la companya del companya de la co
	care should be taken to ensure that such	and the second s	arter Supergraph &
	platforms or stairs do not give access to	and the state of t	3 Harden
S. Harris	danger zones of machinery.		and the same of th
	The walking areas shall be made from materials which remain as slip resistant as practicable under working conditions and, depending on the height from the ground, suitable guard-rails(see ISO14122-3)shall be provided.		N/A
7	In large automated installations, particular	· · · · · / · · · /	N/A
	attention shall be given to safe means of		And Salar Alan
	access such as walkways, conveyor bridges or	and the second second	San Con San
	crossover points.	of State of the st	States States
S. T.	Means of access to parts of machinery		N/A
	located at a height shall be provided with		atter ter Suranti
	collective means of protection against	S II September S Jeffer	Settle S. 15
	falls(e.g. guard-rails for stairways, stepladders		State State State
Martin S	and platforms and/or safety cages for ladders)		and the second s
	As necessary, anchorage points for personal	ST. Sandari S. James S.	N/A
	protective equipment against falls from a	Salar	S alex
	height shall also be provided(e.g. in carriers of		September 1
	machinery for lifting persons or with elevating control stations)		Market Statement
Street Str.	Openings shall whenever possible open		N/A
	towards a safe position, They shall be	and the state of t	IN/A
	designed to prevent hazards due to	the state of the s	order to another
	unintended opening.		arti gutandi. S
S HIT	The necessary aids for access shall be		N/A
	provided(e.g. steps, handholds).Control	St. John St. John St.	State of the state
	devices shall be designed and located to	A A ST A ST	all a defer a deferred
	prevent their being used as aids for access.		

Clause	Requirement + Test	Result - Remark	Verdict
S He lei	When machinery for lifting goods and/or		N/A
	persons includes landings at fixed levels,	. Start Spirit Spirit	S. 115 .
	these shall be equipped with inter locking	A part of the same	Special State of Special State of Special Spec
	guards preventing falls when the platform is	Service Servic	alegation to be a first
	not present at the level.	d Ser at Ser a series	S" e
SE HILLSHILL	Movement of the lifting platform shall be	the set of set of the set of	N/A
	prevented while the guards are open.	at the second of	Series Lini
, i	For detailed provisions see ISO 14122.	Market of the state of the stat	N/A
and the state of t	Information for use	di Salaini di Salaini di Salaini	-
6.4	General requirements		_
5.4.1	Drafting information for use is an integral part	of the state of th	aster ater
Application State	of the design of a machine(see figure2).		P
5.4.1.1	Information of use consists of communication		P
and the same of th	links, such as texts, words, signs, signals,	and and a second second	Surface Surface
	symbols or diagrams, used separately or in	et st approximation of the state of	er gari
	combination to convey information to the user. It	Service Servic	at the state
	is directed to professional and/or	of and the second	Surger to the surger
	non-professional users.		S. Interior
.4.1.2	Information shall be provided to the user	a series of series of	-
St. State	about the intended use of the machine, taking	The state of the s	
	into account, notably, all its operating modes.	part of the same of	
British Parket	The information shall contain all directions	A STATE OF THE STATE OF	-Æ
	required to ensure safe and correct use of the	See John See 1	9 1
	machine. With this in view, it shall inform and	I get all selections and	and the state of
	warn the user about residual risk.		Martino Real & Martin
S Hilliam S	The information shall indicate, as appropriate,	a state of the sta	-
S. Hillshiller	- the need for training,		° P
di and	- the need for personal protective equipment,	at the second of	P as
		Market and a second and a second as	are ter Sure
and the state of t	- the possible need for additional guards	d Sept di apper	P
	devices (see Figure 2, Footnote d).		er entre
	/	of the second se	arti arti
Application of the state of the	It shall not exclude uses of the machine that		P of
	can reasonably be expected from its		and the same
	designation and description and shall also	and and a second of the second	State State
	warn about the risk which would result from		est survi
	using the machine in other ways than	Salar	at the state
	the ones described in the information,	of and the second	S marin
	especially considering its reasonably		S. Hillander
	foreseeable misuse.	S John St John Spirit	and the second
.4.1.3	Information for use shall cover, separately or in	The state of the s	, P
and the S	combination, transport, assembly and installation,	part of the same of	S. Hallander
	commissioning, use of the machine (setting,	prince of the second of the second of	Internet S.
	teaching/programming or process changeover,	Service Servic	9 1
	operation, cleaning, fault-finding and	The second of th	ENTRO TO STREET
	maintenance) and, if necessary, dismantling,	The second of th	Lighter Red & William
	disabling and scrapping.	J Ser Ji Ser J Ser Jen	9" ,, 9
5.4.2	Location and nature of the information for use		-
es agent	Depending on the risk , the time when the		<sub>aug</sub> errer P
	information is needed by the user and the		and the State of t
	machine design , it shall be decided whether the	and the second second	S Hilland
	information – or parts thereof – are		eler spenderter
	//- pr	and the state of t	Se do

photo Service	EN ISO 12100:201		State Markey
Clause	Requirement + Test	Result - Remark	Verdict
	- in /on the machine itself (see 6.3 and 6.4.4)	and the second second	P.
garden Sand	-in accompanying documents ( in particular instruction handbook , see 6.4.5)		P
Supplied and	- on the packaging		P P
and the state of t	- by other means such as signals and warnings outside the machine.		P <sup>®</sup>
or Supplied the Supplied to th	Standardized phrases shall be considered where important messages such as warnings need to be given (see also IEC 62079)		P
6.4.3	Signals and warning devices	p <sup>rit</sup> p <sup>rit</sup> se <sup>pti</sup> se <sup>pti</sup>	-
	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.		Per
	Such signals may also be used to warn the operator before the triggering of automatic protective measures (see last paragraph of 5.2.7)		P
S" de la	It is essential that these signals:		, ric -
alegariti. Selesation	- be emitted before the occurrence of the hazardous event;	Carlotte and the second	P P
agin tight	- be unambiguous;	state of the state	, (c)P
Sure Sure of the S	<ul> <li>be clearly perceived and differentiated from all other signals used;</li> <li>be clearly recognized by the operator and other persons.</li> </ul>		P
S Bertelling	The warning devices shall be designed and located such that checking is easy.		P
and the state of t	The information for use shall prescribe regular checking of warning devices.		P of
de de la companya de	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		P
6.4.4	devices.  Markings, signs (pictograms), written		
S represent	warnings  Machinery shall bear all markings which are necessary:		-
Salarati Salarati	a) for its unambiguous identification, at least - name and address of the manufacturer; - designation of series or type; - serial number, if any.		P
per de la companya de	b) in order to indicate its compliance with mandatory requirements;		-
e series series	- marking; -written indications (e.g. for machines intended for use in potentially explosive atmosphere)		P



Clause	Paguiroment + Test	Result - Remark	Verdict
Clause	Requirement + Test	Result - Remark	verdict
- Harden Lin	c) for its safe use, e.g. :		
	- maximum speed of rotating parts;	the state of the s	Same P
	- maximum diameter of tools;	and grader to appear the party of the party	September 1
	-mass (expressed in kilograms) of the	and the second second	Aprili Spring
	machine itself and/or of removable parts	Salar St. James St.	e de la company
	- maximum working load;		S and the state of
	- necessity of wearing personal protective	d plant St. parti Sperie	Harten St. Harten
	equipment;		titi Supringer S
	- guard adjustment data;	and St. Andrew St.	and the state of t
· Santariti	- frequency of inspection.		The state of the s
	Information printed directly on the machine	get the second s	* P
	should be permanent and remain legible	and the state of t	
er Heriota	throughout the expected life of the machine.	and the same of th	The state of the s
	Signs or written warnings only saying		Pari
NI HILITON	"danger" shall not be used.	S profession of the second	- Walder
	Readily understandable signs (pictograms)	and the second of the second	P P
	should be used in preference to written		S. M. Alberton State
and the first	warnings.		and the state of t
	Signs and pictograms should only be used if the	6 / 6/ / /	of P
	are understood in the culture in which the	de la company de	Sept. Sept. Sept.
Market Paris	machinery is to be used.		artist Statement
	Markings shall comply with recognized	State of the state	P.
	standards (see ISO 2972, ISO 7000,		S Hard
	particularly for pictograms, symbols, colours)	A part of part of the	Se de la
	See EN 60204 series as regards marking of	of Branch State State State	the Supplied of B
S Harry Till	electrical equipment.	JA St. Jack St. Jack	yer e
6.4.5	Accompanying documents (in particular,	e de ser de la companya del companya del companya de la companya d	-
and the second	instruction handbook)	and the second second second	9
6.4.5.1	Contents		-
	The instruction handbook or other written	and the second second	-
	instructions (e.g. on the packaging ) shall	of parts self and self	
	contain among others:	A THE STATE OF THE	§ ·
	a) information relating to transport, handling and	State of the state	P and
	storage of the machine e.g. :	partition of the state of the s	d' Margarat d'
S HILDREN . Let			Marketin S. St.
	- storage conditions for the machine;	St. Jan. Sp. 1	P ,,,
		S A SA	
	-dimensions , mass value(s), position of the	and Salar and Salar and Salar and Salar	P
- Marting to	centre (s) of gravity;		Martin State
	-indications for handling (e.g. drawings	S of a grant of the state of	s <sup>err</sup> l <sub>es</sub> tri P <sub>1,17</sub>
	indicating application points for lifting	A Maria Maria Cara Maria	State The Property
and the state of t	equipment)	and the second second	artifi Statement of the
	b) information relating to installation and		e for
S rote	commissioning of the machine, e.g.	and the second second	Supplier
ge tel	- fixing/anchoring and vibration dampening	) // S // S/ /	P P
	requirements	F James Street Street Street	iti automotiv gir
S Halann		A ST AND STATE OF	yer S
S Halanda	- assembly and mounting conditions;		Por Por
The state of the s		and the state of t	S Lander of the Land
Jaffer St.	- space needed for use and maintenance;		P
		di Salah di Salah	Super
S allegation of	- permissible environmental conditions (e.g.		P
	temperature, moisture, vibration,	and the second second	State
	electromagnetic radiation);	all all some services and all services are services are services and all services are service	et seem seems a



o tot	EN ISO 12100:201		Salter Park Co.
Clause	Requirement + Test	Result - Remark	Verdict
S Supple of the	-instructions for connecting the machine to power supply (particularly about protection against electrical overloading);		P, P
S the state of the	- advice about waste removal /disposal;		Statement P
Sandra Sandra	-if necessary, recommendations about protective measures which have to be taken by the user; e.g. additional safeguards, safety distances, safety signs and signals.		P'
Halseling."	c) information relating to the machine itself, e.g. :		_
, and the state of	-detailed description of the machine, its fittings, its guards and/or protective devices;		State of the State
	-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.		P
Sparente and the state of the s	-diagrams (especially schematic representation of safety functions);		get grand P
or o	- data about noise and vibration generated by the machine, about radiation, gases, vapours, dust emitted by it, with reference to the measuring methods used.		P. P.
ga <sup>ti</sup> S <sup>ari</sup>	-technical documentation about electrical equipment (see EN 60204 series)		Salara P and P and the salara
S pare	-documents attesting that the machine complies with mandatory requirements;		P 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
gette tri	d)information relating to the use of the machine, e.g. about:		P REPORT
	<ul> <li>- intended use;</li> <li>- description of manual controls (actuators);</li> <li>- setting and adjustment;</li> <li>- modes and means for stopping (especially emergency stop)</li> <li>- risks which could not be eliminated by the protective measures taken by the designer;</li> <li>- particular risks which may be generated by certain applications, by the use of certain fittings, and about specific safeguards which are necessary for such applications.</li> <li>-reasonably foreseeable misuse and prohibited usages;</li> <li>- fault identification and location, repair, and restarting after an intervention;</li> <li>- personal protective equipment which need to be used and training required.</li> </ul>		P
- general e	usd and training required.  e) information for maintenance e.g.	, , , , , , ,	S D



Clause	Requirement + Test	Result - Remark	Verdict
Siddoo s	-nature and frequency of inspections for	Troom Tromain	P
		St. Salar it Salar	gr F;
	safety functions;	1 artis Sandari	St. Jacobs 1 at
	-instructions relating to maintenance	art seems a seems and seems a	Se de la company
	operations which require a definite technical	State of the state	and the state of t
	knowledge or particular skills and hence	Sent of part of part of	ye Sheet .
	should be carried out exclusively by	and the state of t	State
	skilled persons (e.g. maintenance staff,	a partir str	s and the same of
	specialists)	A ST AND STATE OF STATE STATE	di diperinti Si
	- instructions relating to maintenance actions	arti Sari Agrafi Sarian	a planter S
	(e.g. replacement of parts ) which do not	and south Sales and Sales are	Brand States
	require specific skills and hence may be	at the state of th	S agents agents
	carried out by users (e.g. operators)	Service of the service of	
	-drawings and diagrams enabling	gal gent gett gett state i andere	September 1
	maintenance personnel to carry out their task	Ser Ser Latin September 1	And St. St.
	rationally (especially fault-finding tasks)		S Contraction of the contraction of
	f) information relating to de-commissioning ,	St. Market St. April 1	Start Starting
	dismantling and disposal;	of self of the self of	ist Super
	g) information for emergency situations , e.g. :		Martin Statement S
	- type of fire-fighting equipment to be used.	S and the state of	Samuel Carlo
	- warning about possible emission or leakage of	a specific Str. Spring Spring Str.	and the state of t
	harmful substance(s), and if possible,	and the second second	eti mpanari
	indication of means to fight their effects.	get Start gett Start in and	gent S
S. Harrison	h) maintenance instructions provided for	S S S S S S S S S S S S S S S S S S S	P
	skilled persons (second dash in e))and	1 and the Sparker of the sparker	S AMBERT 1 AS
	maintenance instructions provided for	art seems a seems and seems a	San State Barrella
	unskilled persons (third dash in e)), that	State of the state	Marketin Statement
	should appear clearly separated from each	Sent St. James St.	er Start .
	other.	and the state of t	State of the state
.4.5.2	Production of the instruction handbook		P <sub>a</sub>
. 1.0.2	Troduction of the mondoustrial names of		arti
S Harris	a) type and size of print shall ensure the best	April Supplied Suppli	, P
	possible legibility. Safety warnings and/or	god de garden grande de d	Santa State
	cautions should be emphasized the use of		d de de la companya d
	colours, symbols and/or large print.	Service of the service of	
610	b) information for use shall be given in the		Part
		St. St. Spirit Spirit	9 F 9"
	language(s) of the country in which the	Sir appendix Spring it and appendix	
	machine will be used for the first time and in the	S articles and the state of the	S" SHOTH S"
	original version.	all States of States of	entre sentre
	If more than one language are to be used, each	er service ser	aggie fei
	language should be readily	S. J. Jan. S. Jan.	Saper State St. St.
	distinguished from the other(s), and efforts	d profit State Arts	States It's pages in
	should be made to keep the translated text	And the State of t	a tel
Market	and the relevant illustration together.	and the second second	or and an article of
	c) whenever helpful to the understanding, text	S , St. Martin State 1	● P
	should be supplemented with written details	1 gent State Little State	State Land
	enabling, for instance, manual controls	and a state of the	Salation of the salation of th
	(actuators) to be located and identified; they	d State of S	Andrew State of the State of th
	should not be separated from the	and the second of the second o	grand Superior
	accompanying text and should follow	and the same of th	S Hard
	sequential operations.	the supplier of the supplier o	and the state of t
utto tari	d) consideration should be given to presenting	A Jack St. July Sales	P P
	information in tabular form where this will aid	and the state of the state of	A STATE OF THE STA
	understanding. Tables should be adjacent to the	Market and all appears to	and the state of t

Clause	Requirement + Test	Result - Remark	Verdict
S married	e) the use of colours should be considered,		P
	particularly in relation to components requiring	Ser series Series	Harding.
	quick identification.	1 parties Service and Service at	Server to Server
, test	f) when information for use is lengthy, a table of	F gard & gard it garden	, P
	contents and/or an index should be given.	d Start Start Start	e and
Wil Street	g) safety-relevant instructions which involve		
	immediate action should be provided in a form	arti Santi	S. Julius India
	readily available to the operator.		State State
3.4.5.3	Drafting and editing information for use		- Late
7. 1.0.0	a) relationship to model : the information shall	A Ji Carlotti Go Japan	# 24 P.4
	clearly relate to the specific model of machine		State
	and, if necessary, other appropriate	de la	Se S
	identification (for example, by serial number).		a net
alegister to	b) communicate principles : when information		Pare
	for use is being prepared, the communication	Set all per Set	de San
	process "see-think-use" should be followed in	Shell State State	State of State
	order to achieve the maximum effect and	and the second s	and the state of t
	should follow sequential operations. The	And the state of t	tti — menteriti Si
	questions "how?" and "why?" should	Service Service Service	grand.
	be anticipated and the answers provided.	S delle Sur delle Surger	arte star
.16	c) information for use shall be as simple	Service Service 1	P P
		of set of set of set of	Str. P
	and as brief as possible, and should be	State of the state	grand State ;
	expressed in consistent terms and units with a	1 de la companya del companya del companya de la co	and the same of
6	clear explanation of unusual technical terms.	the state of the s	
	d) when it is foreseen that a machine will be put	and the state of t	,, Supplie P
	to non-professional use, the instructions	and the second second second	are seement
	should be written in a form that is readily		State of the state
	understood by the non-professional users. If	a profesion state of the state	and the state of t
	personal protective equipment is required for the	de St. Jahr Spirit Spirit	at appropriate Str
	safe use of the machine, clear advice	of State and State of Contract	galle S
	should be given, e.g. on the packaging as well as	article article and the second	and the state of t
	on the machine, so that this information is	de de servicio de la companya del companya del companya de la comp	St. Martin Martin
Martiner, St.	prominently displayed at the point of sale.		9" 9" g"
	e) durability and availability of the documents :	and the state of t	P P
	documents giving instructions for use should be	Set Set of September 1	print St. St.
	produced in durable form (i.e. they should be	Ser parties Server 11 Server Si	and the second
	able to survive frequent handling by the user). It	St. It add to the state of the	Sur Herri Sur
	may be useful to mark them "keep for future	of Salar and Japan S. Jahr	Salar Salar Salar
	reference". Where information for use is kept in		and the State of t
	electronic form (e.g. CD, DVD, tape) information	a de la companya de l	s. State Silver Silver
	on safety-related issues that	and the state of t	State of pages.
	need immediate action shall always be	gent St. Anti Spirit	S. Hatsutato
	backed up with a hand copy that is readily	part St. part Spring Spring	eri e
S Hitelie	available.		Alternation (St. 1)
g. ter and and a	Documentation of risk assessment and risk	1 pt 8 pt 1	-
	reduction	a strain and a state of the sta	<b>9</b>
Radiana C	The documentation shall demonstrate the	a set of and	-
	procedure that has been followed and the		Japan 10
	results that have been achieved. This	and the second of the second o	G <sup>**</sup>
	includes, when relevant, documentation	and the second second	4
. SHEETE TEST	a)the machinery for which the risk		<sub>a</sub> ref @ P
	assessment has been made (for example,	And the second second	er agenteed
	specifications, limits, intended use);	per service service service	State of State of the State of
Me Tel	b) any relevant assumptions that have been	A get Set at Set 1	P
	made (loads, strengths, safety factors, etc.);	St. It was a state of the state	9 9 9

	EN ISO 12100:201		
Clause	Requirement + Test	Result - Remark	Verdict
Starte Starten	c) the hazards and hazardous situations identified and the hazardous events considered in the risk assessment		g d'P,
ger Spategyeteti S	d) the information on which risk assessment was based (see 5.2):		Supplied By
e de la companya del companya de la companya del companya de la co	the data used and the sources (accident histories, experience gained from risk reduction applied to similar machinery, etc.);		P <sup>s</sup>
Supplement .	2) the uncertainty associated with the data used and its impact on the risk assessment;		P gri
	e) the risk reduction objectives to be achieved by protective measures;		and the P
State State of	f) the protective measures implemented to eliminate identified hazards or to reduce risk;		P
garden at a supplier	g) residual risks associated with the machinery;		P man
S metalin S	h) the result of the risk assessment (see Figure 1);		8" P 8"
per se de la companya	i) any forms completed during the risk assessment.		partir B



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## 3.4 Noise test report

# According to the EC Machinery Directive 2006/42/EC

## **TABLE OF CONTENTS**

- I: Introduction
- 1.1 Normative references.
- 1.2 Types of Noise Level
- 1.3 Test environment
- II: Test Instructions
- 2.1 Photographs of the test instruments
- 2.2 Photographs of the test setup
- **III: Microphone Positions & Machinery Conditions**
- 3.1 Microphone Positions.
- 3.2 Machinery Conditions.
- **IV: Test Results**

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#### I: Introduction

In general this test report for the Haiqing injection molding machine and its relative decoiler made by Shenzhen Huasheng Testing Technology Co., Ltd. carried out in accordance with the clause 1.7.4 of Machinery Directive and some relative requirements described as following.

#### 1.1 Normative references

Emission sound power levels are measured in accordance with 85 EN ISO 11202:2009. Sound power levels are measured in accordance with the enveloping surface measuring method shown in EN ISO 3746: 2009.

### 1.2 Types of Noise level

The international standard mentioned above is applicable to the noise source of any type & size except for the machinery with very tall and/or very long size. It is found appropriate for this machinery to use this standard during the testing of noise level.

#### 1.3 Test environment

The testing was carried out to the machine located inside factory with the appropriate control of background noise.

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# II: Test Instructions

100 m	Equipment No.	Equipment's name	Model	specification	Last time calibrate	Next time calibrate	manufacturer
	HK1125	Sound level meter	AWA56100	30~130Db 20~12.5kH A,C,Z weiging	Dec.03.2023	Dec.02.2024	Hangzhou Aihua Equipment CO,.LTD

## Photographs of the test instruments Sound level meter



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# **III: Microphone Positions & Machinery Conditions**

## 3.1 Microphone Positions

When measuring the sound power level the microphone position is set up according to EN ISO 3746:2009, The position on the top of machine is omitted to keep the inspector from dangerous situation. Such a procedure is acceptable by the ISO/TC 43 technical committee.

When measuring the sound emission level the microphone position is set up according to BS EN ISO1120-2009.

# 3.2 Machinery Conditions

The new machine with features described above has been provided for the test.

#### **IV:Test Results**

**Noise Test Report** 

According to	EN ISO 3746:2009, BS E		
Ambient temperature	23.3°C	Humidity	47%
The measurement d	istance d	1m	

Sound Power Level Test Report

	Running			
73.7dB	Position 5	74.1dB		
73.7 dB	Position 6	74.1 dB		
74.0 dB	Position 7	73.8 dB		
74.2dB	Position 8	74.0 dB		
73.9dB	Average 5 to 8	74.0 dB		
Background noise				
Corrections for background noise		0 d B		
The environment correction		6.6 dB		
Sound pressure level		70.0 dB		
Sound power level		70.0 dB		
	73.7 dB 74.0 dB 74.2dB 73.9dB	73.7 dB       Position 6         74.0 dB       Position 7         74.2dB       Position 8         73.9dB       Average 5 to 8         73.5 dB       0 d B         on       6.6 dB         70.0 dB		



End of report-