


<b>TEST REPORT</b>	
<b>EN ISO 14120:2015</b>	
<b>Safety of machinery – Guards – General requirements for the design and construction of fixed and movable guards</b>	
Report Number .....	190531010GZU-004
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Address.....	Block E, No.7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City, GETDD, Guangzhou, China
Testing location.....	Huade Road, Jian Economic Development Zone, Jinan City, Shandong Province, China
<b>Applicant's name</b> .....	Jinan Aotto Automation Co., Ltd.
Address.....	No.355, Huade Road, Jinan Economic Development Zone, Jinan City, Shandong Province, China
<b>Test specification:</b>	
Standard .....	EN ISO 14120:2015
Test procedure .....	CE
Non-standard test method.....	N/A
<b>Test Report Form No.</b> .....	TTRF_ISO14120_1A
Test Report Form(s) Originator .....	Intertek Guangzhou
Master TRF.....	Dated 2019-7
<b>Test item description</b> .....	Polycarbonate Panel Fence
Trade Mark .....	ALLSAFE
Model/Type reference.....	AAP Series Fence
Manufacturer.....	Jinan Aotto Automation Co., Ltd
Ratings.....	See page 3 for detail

Copy of marking plate

The artwork below may be only a draft.

Specification Model	AAP-01-122001	
Company Name	Jinan Aotto Automation Co., Ltd.	
Address	No. 355, Huade Road, Jinan Economic Development Area	
Contact	0531-86521778/86521788	

Remarks: N/A

<p><b>Test item particulars</b></p> <p>Classification of installation and use ..... : Distance guard, fixed installation, indoor use only</p> <p>Usage..... : Perimeter fence</p> <p>..... :</p>																																																									
<p><b>Possible test case verdicts:</b></p> <p>- test case does not apply to the test object ..... : N/A</p> <p>- test object does meet the requirement..... : P(Pass)</p> <p>- test object does not meet the requirement..... : F(Fail)</p> <p>- test object accepted by engineering judgement ..... : A</p>																																																									
<p><b>Testing</b> .....</p> <p>Date of receipt of test item ..... : 2019-07-04</p> <p>Date (s) of performance of tests ..... : 2019-07-04 ~ 2019-08-20</p>																																																									
<p><b>General remarks:</b></p> <p>"(see remark #)" refers to a remark appended to the report.</p> <p>"(see appended table)" refers to a table appended to the report.</p> <p>Throughout this report a point is used as the decimal separator.</p> <p>The test results presented in this report relate only to the object tested.</p> <p>This report shall not be reproduced except in full without the written approval of the testing laboratory.</p> <p>Determination of the test result includes consideration of measurement uncertainty from the test equipment and methods.</p> <p>This report is only valid together with report 190531010GZU-003 issued on 20 August 2019. Testing is conducted on model AAP-01-12 20 01.</p>																																																									
<p><b>Name and address of factory (ies):</b></p>	<p>Jinan Aotto Automation Co., Ltd.</p> <p>Huade Road, Jian Economic Development Zone, Jinan City, Shandong Province, China</p>																																																								
<p><b>General Product Information</b></p> <p>The Polycarbonate Panel Fence is applied to preventing arc lighting or observing inside working condition. The fence contents polycarbonate panel and frame made by 20mm x 20 mm hollow steel square tube. The panel is installed horizontally between 2 supporting posts by 4 brackets per panel. The supporting posts are 60mm x 60mm square hollow steel tube.</p> <p>The specification of AAP-01-12 20 01 is below:</p> <p>A A P - 01 - 12 20 01</p> <table border="0"> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td>Colour code: various colour, defined by manufacturer (alternative: 01~99)</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td>Height, expressed in decimetres (alternative: 20/18/16/14/12/10)</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td>Width, expressed in decimetres (alternative: 12/10/08/07/05/03)</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td>Product category: 01 series – 2mm polycarbonate panel (alternative: 02 series – 3mm polycarbonate panel, 03 series – 4mm polycarbonate panel)</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td>Product series: Wire mesh fence</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td>Brand name: ALLSAFE</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td>Company name: Aotto</td> </tr> </table>									Colour code: various colour, defined by manufacturer (alternative: 01~99)								Height, expressed in decimetres (alternative: 20/18/16/14/12/10)								Width, expressed in decimetres (alternative: 12/10/08/07/05/03)								Product category: 01 series – 2mm polycarbonate panel (alternative: 02 series – 3mm polycarbonate panel, 03 series – 4mm polycarbonate panel)								Product series: Wire mesh fence								Brand name: ALLSAFE								Company name: Aotto
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EN ISO 14120:2015			
Clause	Requirement + Test	Result - Remark	Verdict
1	<b>Scope</b>	Informative	P
2	<b>Normative references</b>	Informative	P
3	<b>Terms and definitions</b>	Informative	P
4	<b>Risk assessments</b>	Informative	P
	In order to select and design types of guards appropriate to particular machinery, it is important to assess the risk arising from the various hazards present at that machinery and the foreseeable categories of persons who can be exposed to the hazard(s) (see ISO 12100:2010, Clause 5).		
5	<b>General requirements for the design and constructions of guards</b>	See below	P
5.1	<b>Machine aspects</b>	---	P
5.1.1	<b>General</b>	---	P
	Proper consideration of foreseeable aspects of the machine environment and operation throughout the foreseeable life of the machine is necessary in the design and application of guards. Inadequate consideration of these aspects can lead to hazardous situations where machinery operation is hindered. This can lead to persons defeating the guards provided, thus, exposing them to greater risk.	Considered	P
5.1.2	<b>Access to hazard zones</b>	---	P
	To minimize access to hazard zones where practicable, guards and machinery shall be so designed as to enable routine adjustments, lubrication, and maintenance to be carried out without opening or removing the guards.  Where access is required within the guarded area, this shall be as free and unobstructed as practicable. The following are examples of reasons for access:  loading and unloading; tool changing and setting; measurement, gauging, and sampling; maintenance and repair; lubrication; removal of waste material (for example scrap, swarf, spillage); obstruction removal; cleaning and hygiene.	No routine maintenance work needed after EUT is installed	P
5.1.3	<b>Containment of ejected parts and other impacts</b>	---	P
	Where there is a foreseeable risk of	The EUT is designed to	P

EN ISO 14120:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	ejection of parts (for example workpiece or broken tooling) from the machine, impacts from parts of machinery, or impacts from the operator, the guard shall, as far as practicable, be designed and constructed so as to contain and withstand such ejections and impacts. See Annexes B and C for options.	contain and withstand impacts from humans or movable parts of machinery at low velocity. See attached test result.	
<b>5.1.4</b>	<b>Containment of hazardous substances</b>	---	N/A
	Where there is a foreseeable risk of emission from the machine of hazardous substances (for example coolant, vapours, gases, swarf, sparks, hot or molten material, dust, solid, or fluid matter), the guard shall be designed according to ISO 14123-1 to contain these substances as far as practicable.  If a guard forms part of an extraction system, this function shall be considered in the design, selection of materials, construction, and positioning of the guard.	EUT is not for this location	N/A
<b>5.1.5</b>	<b>Noise</b>	---	N/A
	Where a requirement has been established to reduce machine noise, guards shall be designed and constructed which will give the required noise reduction as well as providing protection against the other hazards present at the machine (see also ISO 11200). Guards acting as acoustic enclosures shall have adequately sealed joints to reduce the emission of noise.  NOTE More information can be found in ISO/TR 11688.	EUT is not for this location	N/A
<b>5.1.6</b>	<b>Radiation</b>	---	N/A
	Where there is a foreseeable risk of exposure to hazardous radiation, guards shall be designed and appropriate materials shall be used in their construction to protect persons from the hazard, see EN 12198- 3. Examples include the use of darkened glazing (see ISO 25980 and EN 12254) to protect from the effects of weld flash or the elimination of openings in a guard around a laser.	EUT is not for this location	N/A
<b>5.1.7</b>	<b>Potentially explosive atmosphere</b>	---	N/A
	Where there is foreseeable risk of explosion, guards shall be designed to contain or dissipate the released energy in a safe manner and direction (for example by use of “explosion relief” panels) (see also EN 1127-1).  A guard shall not be an ignition source. To prevent the guard from becoming an ignition source, these aspects shall be considered (e.g. hot surfaces,	EUT is not for this location	N/A

EN ISO 14120:2015			
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	mechanically generated sparks, electricity, static electricity, electromagnetic waves, and ultrasonic). NOTE Where a guard is designed to protect against fire additional information is given in ISO 19353.		
<b>5.2</b>	<b>Human aspects</b>	---	P
<b>5.2.1</b>	<b>General</b>	---	P
	Reasonably foreseeable aspects of human interaction with machinery (for example when loading, maintaining or lubricating) shall be given proper consideration in the design and construction of guards.	Considered	P
<b>5.2.2</b>	<b>Safety distances</b>	---	N/A
	Guards intended for preventing access to hazard zones shall be designed, constructed, and positioned to prevent parts of the body from reaching hazard zones according to ISO 13857. For interlocked movable guards, safety distances according to ISO 13855 shall also be fulfilled.	The application of EUT refer to ISO 13857	N/A
<b>5.2.3</b>	<b>Control of access to the hazard zone</b>	---	N/A
	Movable guards shall be designed and positioned such that during normal operation they are prevented from closing with persons in the hazard zone. Where this is not practicable, other means shall be used to prevent persons from remaining undetected within the hazard zone. See ISO 12100:2010, 6.3.3.2.3.	Not movable type	N/A
<b>5.2.4</b>	<b>Viewing</b>	---	P
	Where viewing of the process is required, guards shall be designed and constructed to offer adequate viewing. This can eliminate the need for defeating them. See also 5.9.	EUT can provide adequate viewing. See also 5.9	P
<b>5.2.5</b>	<b>Ergonomic aspects</b>	---	P
<b>5.2.5.1</b>	<b>General</b>	---	P
	Guards shall be designed and constructed taking into account ergonomic principles [see also ISO 12100:2010, 6.2.8 a) and c)].	Considered. See also ISO 12100:2010, 6.2.8 a) and c)	P
<b>5.2.5.2</b>	<b>Size, weight, and design</b>	---	N/A
	Removable sections of guards shall be designed to be of a suitable size, weight, and design to permit ease of handling. Guards which cannot readily be moved or transported by hand shall be provided or be capable of being provided with suitable attachment devices for transport by means of a lifting device.  The attachments or provisions can be, for instance, standard lifting appliances with slings, hooks,	EUT does not contain removable section	N/A

EN ISO 14120:2015			
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	<p>eyebolts, or simply tapped holes for appliance fixing, appliances for automatic grabbing with a lifting hook, when securing is not possible from the ground, or</p> <p>lifting gear and appliances integrated into the guard.</p> <p>When the mass of the guard or removable parts is sufficient to require the use of general lifting machinery, an indication, on the guard itself and removable parts or in the information for use, of the value of their mass expressed in kilograms (kg).</p> <p>NOTE Where removable sections of guards are intended to be moved or transported by hand, see EN 1005-2.</p>		
<b>5.2.5.3</b>	<b>Operating force</b>	---	N/A
	<p>Movable guards or removable sections of guards shall be designed to permit ease of operation.</p> <p>The observance of ergonomic principles in designing guards contributes to increasing safety by reducing stress and the physical effort of the operator. This improves the performance and reliability of the operation, thereby reducing the probability of errors at all stages of machine use (see ISO 12100).</p> <p>Operating forces can be reduced by the use of devices such as springs, counterbalances, or gas struts.</p>	<p>EUT is not movable type.</p> <p>EUT does not contain removable section</p>	N/A
<b>5.2.5.4</b>	<b>Power operated guards</b>	---	N/A
	<p>Where guards are power operated, they shall not be capable of causing injury (for example, from contact pressure, force, speed, sharp edges). Where a guard is fitted with a protective device which automatically initiates re-opening of the guard, the closing force shall not exceed 150 N and the kinetic energy of the guard shall not exceed 10 J. Where no such protective device is fitted, these values shall be reduced to 75 N and 4 J respectively.</p> <p>These values are only applicable when a wide closing edge is used and no hazards from cutting or shearing are present.</p>	EUT is not power operated.	N/A
<b>5.2.6</b>	<b>Intended use</b>	---	P
	Guards shall be designed to take into account foreseeable use and reasonably foreseeable misuse (see ISO 12100:2010, 3.23 to 3.24 and Clause 5).	See ISO 12100:2010, 3.23 to 3.24 and Clause 5	P
<b>5.3</b>	<b>Guard design and construction aspects</b>	---	P
<b>5.3.1</b>	<b>General</b>	---	P
	All foreseeable aspects of guard operation shall be given proper consideration at the design stage to	Considered	P

EN ISO 14120:2015			
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	ensure that the design and construction of the guard itself does not create further hazard.		
<b>5.3.2</b>	<b>Crushing or trapping points</b>	---	P
	Guards shall be designed so as not to cause hazardous crushing or trapping points with parts of the machine or other guards (see also ISO 13854).	Considered. Refer to attached test result	P
<b>5.3.3</b>	<b>Durability</b>	---	P
	Guards shall be designed to perform their function properly throughout the foreseeable life of the machine. When this is not practicable, degradable parts shall be replaceable.  NOTE Decreased durability can be caused, e.g. by environmental influences such as varying temperatures, light, oxygen, or chemicals (e.g. cleaning agents).	EUT is powder coated	P
<b>5.3.4</b>	<b>Hygiene</b>	---	N/A
	Where applicable, guards shall be designed so as not to create hazards to hygiene by trapping items or material, for example food particles, or stagnant fluids (see also ISO 14159).	EUT is not applied to hygiene condition	N/A
<b>5.3.5</b>	<b>Cleaning</b>	---	P
	Where it is a requirement of the process, notably for the processing of food and pharmaceuticals, guards shall be so designed that they are not only safe to use but can also be easily cleaned.	EUT is easily cleanable as per manufacturer instruction.	P
<b>5.3.6</b>	<b>Exclusion of contaminants</b>	---	P
	Where it is a requirement of the process, guards shall be designed to exclude contaminants from the process, for example in the food, pharmaceutical, electronic, and related industries.	Depends on requirement of the process	P
<b>5.3.7</b>	<b>Sharp edges, etc.</b>	---	P
	Guards shall be designed and constructed so as not to have exposed sharp edges and corners or other hazardous projections.	No sharp edges or corners found	P
<b>5.3.8</b>	<b>Integrity of joints</b>	---	P
	Welded, bonded, or mechanically fastened joints shall be of sufficient strength to suit reasonably foreseeable loading. Where bonding agents are used, these shall be compatible with the process and materials being used. Where mechanical fastenings are used, their strength, number, and spacing shall be sufficient to ensure the stability and rigidity of the guard.	Refer to attached test result	P
<b>5.3.9</b>	<b>Removal of fixed guards</b>	---	P
	Demountable fixed parts of guards shall only be removable with the use of a tool (see 3.8). See also	All parts must be removed by tools	P



EN ISO 14120:2015			
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	<p>8.5 and 8.6.</p> <p>Fixed guards shall be designed to prevent easy removal.</p> <p>NOTE 1 This is because operators can prefer to use an easily removable fixed guard instead of using an interlocked movable guard.</p> <p>Quick release fasteners such as self-clinching fasteners shall not be used to secure fixed guards from outside the guarded area.</p> <p>NOTE 2 The use of fastenings that can be released quickly from the inside of the guarded area should not be regarded as an alternative to providing an emergency exit. The emergency release of guards with interlocking/guard locking is dealt with in ISO 14119. See also Clause 6.</p>	See 8.5 and 8.6	
<b>5.3.10</b>	<b>Mounting of removable fixed guards</b>	---	P
	Fixed guards which are removable shall, where practicable, be unable to remain in place without their fixings.	The fixed guard must be secured by bolts	P
<b>5.3.11</b>	<b>Adjustable guards</b>	---	N/A
	<p>Adjustable guards shall be designed and constructed to restrict the opening to a minimum, consistent with the passage of material.</p> <p>Both manually adjusted and automatically adjusted (self-closing) guards can be used in conjunction with fixed guards.</p> <p>Manually adjustable guards shall</p> <p>be designed and constructed so that the adjustment remains fixed during a given operation, and</p> <p>be easily adjustable without the use of a tool.</p> <p>Automatically adjustable guards shall</p> <p>be designed and constructed so that the gap between the guard and the material is always limited to the minimum that is necessary for the work, and</p> <p>as far as practicable, be designed to prevent the automatic adjustment being defeated.</p> <p>NOTE It will not be possible in all cases to prevent automatically adjustable guards from being defeated, bypassed, or rendered non-operational in an easy way.</p>	EUT is not adjustable type	N/A
<b>5.3.12</b>	<b>Movable guards</b>	---	N/A
	<p>The opening of movable guards shall require deliberate action.</p> <p>Where possible, movable guards shall be attached to the machine or adjacent fixed elements so that they are retained, for example by hinges or slides,</p>	EUT is not movable type	N/A

EN ISO 14120:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	even when open. Such attachments shall only be removable with the use of a tool (see 3.8). Interlocked moveable guards shall be positioned relative to the hazard zone in accordance with ISO 13855.		
<b>5.3.13</b>	<b>Closed position of movable guards</b>	---	N/A
	The closed position of movable guards shall be unambiguous and distinct. The guard shall be held in position against a stop by means of gravity, a spring, catch, or other means.	EUT is not movable type	N/A
<b>5.3.14</b>	<b>Interlocking guards with a start function (control guards)</b>	---	N/A
	Interlocking guards with a start function can be used only if ISO 12100:2010, 6.3.3.2.5 and all the following are fulfilled:  the dimensions and shape of the machine allow for the operator or any person having to intervene on the machine to have a global view of the whole machine/process;  where starting the machine with an interlocking guard with a start function is one of the possible control modes of the machine, mode selection shall be ensured according to ISO 12100:2010, 6.2.11.10.  NOTE The hazard zone considered above is any zone where the operation of hazardous elements is initiated by closure of the control guard.	EUT is not interlocking type	N/A
<b>5.4</b>	<b>Materials, rigidity, and impact requirements</b>	---	P
<b>5.4.1</b>	<b>General</b>	---	P
	The following aspects shall be considered in the selection of suitable materials for the construction of guards. These properties shall be maintained throughout the foreseeable life of the guard.	Considered	P
<b>5.4.2</b>	<b>Impact and ejection resistance</b>	---	P
	Guards shall, as far as practicable, be designed and the material selected to withstand and contain reasonably foreseeable impacts and ejections according to 5.1.3.  Materials for viewing panels shall be selected with properties suited to resist the mass and velocity of the ejected object or material. Where guards are fitted with viewing panels, special consideration shall be given to the selection of materials and method of fixing them. Guards shall resist static and dynamic forces (pressure, impacts) according to the risk assessment.  NOTE The impact resistance depends, e.g. on the properties of the material being used, its strength,	See 5.1.3  See attached test result for impact test.	P

EN ISO 14120:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	the fixing, and its ageing.		
<b>5.4.3</b>	<b>Rigidity</b>	---	P
	Support posts, guard frames, mountings, and infill materials shall be selected and arranged to provide a rigid and stable structure and to resist deformation. This is especially important where deformation of material could be detrimental to maintaining safety distances.	EUT is supported by steel post	P
<b>5.4.4</b>	<b>Secure fixing</b>	---	P
	Guards or parts of guards shall be secured by fixing points of adequate strength, spacing, and number to remain secure under any foreseeable loading or impact. Fixing can be by means of mechanical fasteners or clamps, welded or bonded joints, or other means suited to the application. See also 5.3.8.	EUT is fixed to ground by bolts according to installation instruction.	P
<b>5.4.5</b>	<b>Reliability of moving parts</b>	---	N/A
	Moving parts, for example hinges, slides, handles, and catches, shall be selected to ensure reliable operation given their foreseeable usage and working environment.	No moving parts installed	N/A
<b>5.5</b>	<b>Containment</b>	---	N/A
	Harmful substances, for example fluids, swarf, dust, and fumes, which can reasonably be foreseen, shall be contained within the guard by a suitable impermeable material according to ISO 14123-1.	Not applicable for the guards	N/A
<b>5.6</b>	<b>Resistance to corrosion</b>	---	P
	Materials shall be selected which are resistant to foreseeable oxidation and corrosion arising from the product, process or environment (e.g. from cutting fluids in machining operations or cleaning, sterilizing agents in food processing machinery). This can be achieved by the application of suitable protective coatings.	Material of guard post and frame: Q235-A steel Material of panel: polycarbonate Finish: Powder coated	P
<b>5.7</b>	<b>Resistance to microorganisms</b>	---	N/A
	Where there is a foreseeable risk to health from bacterial and fungal growth, materials that inhibit this growth and can be easily cleaned and, if necessary, disinfected are used in the construction of guards and shall be selected according to ISO 14159.  Examples are machines in the food, pharmaceutical and related industries, and catering in hospitals or hotels.	Not applicable for EUT	N/A
<b>5.8</b>	<b>Non-toxicity</b>	---	N/A
	Materials and finishes used shall be non-toxic in all foreseeable conditions of use and compatible with	Not applicable for EUT	N/A

EN ISO 14120:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	the process involved especially in food, pharmaceutical, and related industries according to ISO 14123-1.		
<b>5.9</b>	<b>Machine viewing</b>	---	P
	Where viewing of machine operation is required through the guard, materials shall be selected with suitable properties. If perforate material or wire mesh is used, this should be of adequate open area and suitable colour to permit viewing. Viewing will be enhanced if the perforate material is darker than the area observed. See also 5.22.	Polycarbonate panel provided	P
<b>5.10</b>	<b>Transparency</b>	---	P
	Materials used for viewing machine operation shall, as far as practicable, be selected from amongst those which retain their transparency despite age and use. Guards shall be designed to make provision for the replacement of degraded materials.  Certain applications can require the selection of materials or combinations of materials that are resistant to abrasion, chemical attack, degradation by radiation, dust attraction by static electrical charge, or surface wetting by fluids which impair transparency.	Polycarbonate panel provided	P
<b>5.11</b>	<b>Shadows and stroboscopic effects</b>	---	P
	Guards shall be designed and constructed so as to minimize shadows and stroboscopic effects which can cause a risk.  NOTE See ISO 12100:2010, 6.2.8 e).	Considered	P
<b>5.12</b>	<b>Electrostatic properties</b>	---	N/A
	Materials of the guard that enclose or is placed in an environment containing dust, fibres, or particles shall be selected to prevent accumulation. If there is a risk of static charge to a hazardous level, guards shall be designed in material with an electrical conductance high enough to avoid build-up of static charge or by other measures to prevent hazardous static charge.  For consideration of ignition sources, see 5.1.7.  NOTE IEC/TR 61340-1 gives guidance on electrostatic problems and hazards	EUT is not applied to this location	N/A
<b>5.13</b>	<b>Guards with electrically conductive parts</b>	---	N/A
	Where guards are made of electrically conductive material and used in electrically powered machines, they might need to be considered as “extraneous conductive parts of the machine” according to IEC 60204-1:2005, Clause 8.	EUT is not part of electrically powered machines.	N/A
<b>5.14</b>	<b>Thermal stability</b>	---	P

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Clause	Requirement + Test	Result - Remark	Verdict
	<p>Materials shall be selected which do not degrade when exposed to the range of foreseeable temperature variations or sudden changes in temperatures. Examples are materials which are not prone to brittle fracture, excessive deformation, or emission of toxic or flammable fumes.</p> <p>Materials selected shall retain their properties in foreseeable climatic and workplace conditions.</p>	<p>Considered</p> <p>Material of guard post and frame: Q235-A steel</p> <p>Material of panel: Polycarbonate</p>	P
<b>5.15</b>	<b>Fire and flammability</b>	---	P
	<p>Where there is a foreseeable risk of fire (see ISO 19353), materials selected shall be spark resistant and fire retardant and shall not absorb or emit flammable fluid, fumes, etc.</p>	<p>Considered</p> <p>Material of guard post and frame: Q235-A steel</p> <p>Material of panel: Polycarbonate</p>	P
<b>5.16</b>	<b>Noise and vibration reduction</b>	---	N/A
	<p>Where necessary, materials shall be selected to provide noise and vibration reduction. This can be achieved by means of insulation (putting an acoustic barrier in the path of the noise), and/or absorption (lining guards with appropriate acoustically absorbent materials) or by a combination of both. Guard panels might also need to be suitably damp to minimize effects of resonance which can transmit or amplify noise.</p>	Not applicable for EUT	N/A
<b>5.17</b>	<b>Radiation protection</b>	---	N/A
	<p>In certain applications, such as welding or the use of lasers, materials shall be selected that protect persons from harmful radiation.</p> <p>NOTE In welding applications, for example, this protection can be by means of a suitably tinted transparent screen which permits viewing but eliminates harmful radiation.</p>	Not applicable for EUT	N/A
<b>5.18</b>	<b>Climbing</b>	---	P
	<p>Climbing on guards shall, as far as practicable, be inhibited by design. Consideration shall be given to this possibility in their construction and the selection of materials and shapes. For example, by eliminating horizontal structural members and the horizontal component of mesh fabric from the outside surface of the guard, climbing is made more difficult.</p>	Design of EUT does not support climbing on guards	P
<b>5.19</b>	<b>Retained fastenings</b>	---	N/A
	<p>When it is foreseen, e.g. maintenance, that the fixed guard will be removed, the fastenings shall remain attached to the guard or to the machinery.</p> <p>The requirement does not necessarily apply to fixed guards that are only liable to be removed, for</p>	Fastenings shall not be removed from guards in maintenance	N/A

EN ISO 14120:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>example, when the machinery is completely overhauled, is subject to major repairs, or is dismantled for transfer to another site.</p> <p>For the same reason, it might not be necessary to apply the requirement for retained fastenings to removable covers provided for access (e.g. for inspection) in casings of machinery if the manufacturer's instructions specify that the repairs requiring removal of these casings are only to be carried out in a specialist repair workshop, and fastenings shall only be removable by the use of a tool.</p> <p>See Annex A for examples of retained fastenings.</p> <p>NOTE This requirement aims to reduce risks due to loss of one or more of the fastenings when guards are removed, for example, for maintenance purposes. This can lead to the guards not being replaced, only partially fixed in place or fixed with replacement fixings that do not have adequate strength, so that the guard cannot adequately perform its protective function, for example, where containment of ejected parts is necessary.</p>		
<b>5.20</b>	<b>Vibration resistance</b>	---	N/A
	Where necessary, to prevent loosening and maintain attachment to the guard, fastenings shall to be fitted with lock nuts, spring washers, etc.	EUT is not designed in vibration resistance condition.	N/A
<b>5.21</b>	<b>Warning signs</b>	---	N/A
	Where access within the guarded area can expose persons to residual risks (e.g. radiation), appropriate warning signs shall be placed at access points.	The guards do not provide access points.	
<b>5.22</b>	<b>Colour</b>	---	P
	<p>Attention can be drawn to the hazard while the guard is opened or left off by highlighting the hazard by the use of suitable colours. For example, if a guard is painted the same colour as the machine, the hazardous parts are painted a contrasting bright colour.</p> <p>Care should be taken in the selection and combination of colours to avoid confusion, e.g. red and yellow, in combination is normally used for emergency stop.</p> <p>When observation of the process is required, guards of perforate material should not be painted in bright colours, e.g. yellow, that might interfere with the viewing of the process.</p> <p>NOTE For further information see EN 614-1.</p>	EUT colour is selected in accordance with design.	P
<b>5.23</b>	<b>Appearance</b>	---	P

EN ISO 14120:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	Guards shall be designed so that they do not add adverse physiological and psychological effects. NOTE See ISO 12100:2010, 6.2.8.	No elements found in EUT that will add adverse physiological and psychological effects	P
<b>6</b>	<b><u>Selection of types of guards</u></b>	Informative	P
<b>7</b>	<b><u>Verification of the safety requirements for guards</u></b>	---	P
<b>7.1</b>	<b>General</b>	---	P
	The aspects of guard design and construction shall be subject to verification by examination, inspection, testing, or calculation. Where practicable, verification shall be carried out with the guard in its working situation.  NOTE 1 For certain type of guards or for machines as specified in the Type-C standards, type testing of the guard is mandatory. In some instances, this might need to be carried out away from the machine, for example power take-off guards and guards for abrasive wheels.  NOTE 2 Some test methods mentioned in the informative Annexes B and C contain optional requirements but, unless a Type-C standard specifies these requirements for certain machines, there is no need to comply with these optional requirements to claim compliance with this International Standard.	Considered	P
<b>7.2</b>	<b>Verification and validation methods</b>	---	P
	Verification and validation can be satisfied by methods including but not limited to the following: visual inspection (A); practical tests (B); measurement (C); observation during operation (D); review of task-based risk assessment (E); review of specifications, layout, and documentation (F).	Considered	P
<b>7.3</b>	<b>Required verification and validation</b>	---	P
	Table 1 lists specific requirements that are identified as essential for the design, construction, and selection of guards provided to protect persons from mechanical hazards. For each requirement, Table 1 indicates the means by which compliance with the requirement shall be verified.	Related method is applied	P
<b>8</b>	<b><u>Information for use</u></b>	---	P
<b>8.1</b>	<b>General</b>	---	P



EN ISO 14120:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	The instructions for use shall contain the required information about guards, their safety parameters, and their functions (e.g. vertical or horizontal orientation), including installation and maintenance (see ISO 12100:2010, 6.4).	Checked and OK	P
<b>8.2</b>	<b>Guard hazards</b>	---	P
	Information shall be provided for any hazards associated with the guards themselves, for example mechanical hazards or flammability of materials and relevant test results.	Checked and OK	P
<b>8.3</b>	<b>Installation</b>	---	P
	Instructions shall be supplied for the correct installation of guards and associated equipment. When guards are to be attached to a structure, the instructions shall include requirements for fixing.  This includes, but is not limited to, the following: fixing to a floor; assembling of movable guards; number and types of fixings; compliance with other relevant standards, e.g. ISO 13857 and ISO 14119.  NOTE When guards are designed to be fixed to a concrete floor, instructions for installation can refer to concrete classification. See for example EN 206-1 with classes C20/25 to C50/60 for compressive strength.	Checked and OK	P
<b>8.4</b>	<b>Operation</b>	---	P
	Instructions shall be provided directing the user to the correct operation of the guards, and the related interlocks if they are supplied with the guard. Warnings against reasonably foreseeable misuse shall be given (see ISO 12100).	Checked and OK	P
<b>8.5</b>	<b>Removal of guards</b>	---	P
	Information shall be provided indicating actions to be taken before guards are removed, for example machine power isolation, dissipation of stored energy, and procedures for the removal of guards.  The information shall also prescribe requirements on procedures for the removal of guards, including — appropriate use of a tool (see 3.7 and 3.8) and — safe working procedure.  NOTE See also ISO 14118 and IEC 60204-1: 2005, 5.3 and 5.4.	Checked and OK	P
<b>8.6</b>	<b>Inspection and maintenance</b>	---	P



EN ISO 14120:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>Details shall be provided of inspections required to identify defects and the maintenance required. This shall include the following, as appropriate:</p> <p>loss of or damage to any part of the guard, especially where this leads to deterioration of safety performance, for example reduction of impact resistance from scratches to glazing materials;</p> <p>deformed or damaged part to be repaired or replaced if the damage has negative influence on safety;</p> <p>replacement of wearing parts;</p> <p>correct operation of interlocks;</p> <p>degradation of jointing or fixing points;</p> <p>degradation by corrosion, temperature change, embrittlement, or chemical attack;</p> <p>satisfactory operation and lubrication, if necessary, of moving parts;</p> <p>modification of safety distances and aperture sizes;</p> <p>degradation of acoustic performance, if applicable.</p> <p>The information for use shall include a warning that fixings for guards (e.g. bolts, screws) should only be replaced with fixings of the same or an equivalent type, e.g. fixing requiring the use of a tool (see 3.7 and 3.8).</p>	Checked and OK	P

## Test Result

### List of Measurement Equipment:

Description	Type/model / Internal ID	Next Calibration Date
Weight scale	TCS-150/T000008CB	2020-4-14
Ruler	91342	2020-4-14

**Testing location:** as client

Manufacturer:	Jinan Aotto Autoamtion Co., Ltd
EUT	Fence
Model	AAP-01-12 20 01
Test Equipment	See the table for measurement equipment
Test conditions	See below table
According to	Annex C of ISO 14120:2015
Date	2019-7-4

### Test conditions:

EUT size	Impact pendulum	Impact side	Height of impact point
2050mm (h) x 1200mm (w)	Steel pendulum	Outside of hazard zone	1.49m
Impact pendulum weight	Drop height	Calculated impact energy	Floor fixation
128 kg	0.49 m	615 J	4 pcs M10 hex bolt

### Test result

Testing item	Test result:
a) buckling/bulging (permanent deformation without crack);	Not found
b) incipient crack (visible only on one surface);	Not found
c) through crack (crack visible from one surface to the other);	Not found
d) penetration (hard or soft body penetrating the material);	Not found
e) guard window or infill material being loosened from its fixing;	N/A
f) guard loosened from guard support.	Not found

--- End of report ---