# APPLICATION FOR CE REPORT

## On Behalf of

## CHANGZHOU SUNNERGY ENERGY TECHNOLOGY CO.,LTD.

## Safety Glasses

**Model:** **SNS12，SNS026，SNS25，SNS25-1，SNS1，SNS09，SNS198，SNS302，SNS306，SNS310**

**Prepared For :** CHANGZHOU SUNNERGY ENERGY TECHNOLOGY CO.,LTD.
No.1-715/716, FUHANYUAN, EAST TAIHU ROAD, XINBEI DISTRICT, CHANGZHOU CITY, JIANGSU PROVINCE.

**Prepared By :** **TMC Testing Services (Shenzhen) Co., Ltd.**
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# TEST Report

**EN 166:2001**

**Personal eye-protection — Specifications**

**Report**

Reference No. ..... TMC181119104-S

Tested by (+ signature) ..... Jack He

Approved by (+ signature) ..... Lemon Rao

Date of issue..... December. 03, 2018

Contents..... 20 pages

**Testing laboratory**

Name ..... TMC Testing Services (Shenzhen) Co., Ltd.

Address..... 1st Floor, Block A1, Zone A, Xinshidai Gongrong Industrial Park, No. 2, Shihuan Road, Shiyan Street, Baoan District, Shenzhen, China

Testing location..... Same as above

Applicant Name ..... : CHANGZHOU SUNNERGY ENERGY TECHNOLOGY CO.,LTD. .

Address..... No.1-715/716, FUHANYUAN, EAST TAIHU ROAD, XINBEI DISTRICT, CHANGZHOU CITY, JIANGSU PROVINCE

**Test specification**

Standard..... EN 166:2001

Test procedure ..... Compliance with EN 166:2001

Procedure deviation ..... N.A.

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

**Test item**

Description ..... Safety Glasses

Trademark..... N/A

Model and/or type reference..... SNS12

Manufacturer ..... CHANGZHOU SUNNERGY ENERGY TECHNOLOGY CO.,LTD. .

Address..... No.1-715/716, FUHANYUAN, EAST TAIHU ROAD, XINBEI DISTRICT, CHANGZHOU CITY, JIANGSU PROVINCE

Rating(s)..... N/A

| **Test case verdicts** | |
|---|---|
| Test case does not apply to the test object..... : | N(.A.) |
| Test item does meet the requirement..... : | P(ass) |
| Test item does not meet the requirement ..... : | F(ail) |
| **Testing** | |
| Date of receipt of test item(sample)..... : | Nov. 26, 2018. |
| Date (s) of performance of tests..... : | Nov 26, 2018 - Dec.03, 2018. |

**Copy of marking plate** (for example model SNS12 )**:**

Safety Glasses
Model :SNS12 PC
meet a criterion no：EN 166:2001
CE
date of manufacture：2018.11
CHANGZHOU SUNNERGY ENERGY TECHNOLOGY CO.,LTD.
Made In China

Note: marking label for other models are identical to above except for model name and rating.

**Remark:**

**-The above markings are the minimum requirements required by the safety standard. For the final productions samples, the additional markings which do not give rise to misunderstanding may be added.**

**Label testing**

**Rubbing for 15 s with a piece of cloth soaked with water. And a further 15 s with a piece of cloth soaked with petroleum.-**

| EN 166 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| **3** | **Terms and definitions** | | **P** |
| | For the purpose of this European Standard, the terms and definitions given in EN 165 and the following apply. | | P |
| **3.1** | **visual centre** | | P |
| | the point on the ocular corresponding to the intersection of the horizontal and vertical planes through the pupil of the appropriate head-form specified in clause 17 of EN 168:2001 when the eye-protector is fitted to it in accordance with the manufacturers instructions | | P |
| **4** | **Classification** | | P |
| **4.1** | **Function of eye-protectors** | | P |
| | The function of eye-protectors is to provide protection against: | | P |
| | impacts of different severities; | | P |
| | optical radiations; | | P |
| | molten metals and hot solids; | | P |
| | droplets and splashes; | | P |
| | dust; | | P |
| | gases; | | P |
| | short circuit electric arc;or any combination of these. | | P |
| 4.2 | Types of eye-protectors | | P |
| | Refer to definitions given in EN 165.(NOTE) | | -- |
| **4.2.1** | **Spectacles with or without lateral protection** | | P |
| **4.2.2** | **Goggles** | | P |
| **4.2.3** | **Face-shields** | | P |
| NOTE | Face-shields normally incorporate a suitable headband, browguard, helmet, protective hood or other appropriate | | P |
| **4.3** | **Types of ocular** | | P |
| **4.3.1** | **Mineral oculars (glass)** | PC | P |
| **4.3.1.1** | **Untoughened mineral oculars** | | P |
| **4.3.1.2** | **Toughened mineral oculars**, toughened chemically, thermally or by other processes to give superior | | P |
| | resistance to impact in comparison with untoughened mineral oculars. | | P |
| **4.3.2** | **Organic oculars (plastic)** | | P |
| | Oculars made in multiple layers joined together by a binder. | | N/A |

| EN 166 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| NOTE | All types of oculars may be further classified into filtering types (for example according to EN 169, EN 170, EN 171, | | N/A |
| **5** | **Designation of filters** | | P |
| | The transmittance characteristics of a filter are represented by a scale number. | | P |
| | The scale number is a combination of the code number and the shade number of the filter, joined together by a dash. | | P |
| | The scale number for welding filters does not include a code number, it comprises the shade number only. | | P |
| | Table 1 gives the designation of the various types of filters specified in this European Standard. | | P |
| 6 | Design and manufacturing requirements | | P |
| **6.1** | **General construction** | | P |
| | Eye-protectors shall be free from projections, sharp edges or other defects which are likely to cause discomfort or injury during use. | | P |
| **6.2** | **Materials** | | P |
| | No parts of the eye-protector which are in contact with the wearer shall be made of materials which are known to cause any skin irritation. | | P |
| **6.3** | **Headbands** | | P |
| | Headbands, when used as the principal means of retention, shall be at least 10 mm wide over any portion which | | P |
| **7** | **Basic, particular and optional requirements** | | P |
| | All eye-protectors shall meet the basic requirements given in 7.1. | | P |
| | Furthermore, according to their intended use, eye-protectors shall, if appropriate, meet one or more of the particular | | P |
| | Optional requirements related to additional properties of eye-protectors are given in 7.3. | | P |
| **7.1** | **Basic requirements** | | P |
| **7.1.1** | **Field of vision** | | |
| | The size of the field of vision is defined in conjunction with the appropriate head-form described in clause 17 of EN 168:2001. | | P |
| | Eye-protectors shall exhibit a minimum field of vision defined by the two ellipses in Figure 1 when placed and andcentered at a distance of 25 mm from the surface of the eyes of the appropriate head-form. The horizontal axis shall be parallel to and 0,7 mm below the height of the line connecting the centres of the two eyes. | | P |

| EN 166 | | | |
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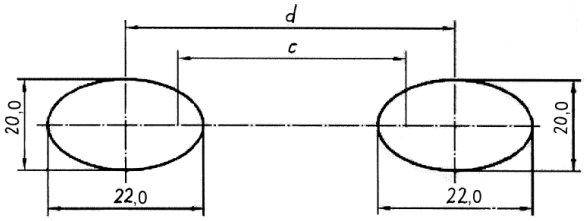
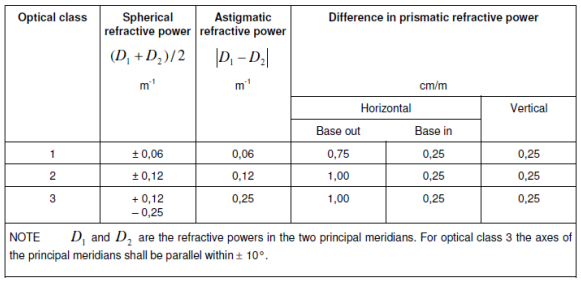
| Clause | Requirement + Test | Result - Remark | Verdict |
| | The horizontal length of the ellipses shall be of 22,0 mm, the vertical width of the ellipses shall be 20,0 mm. The centre distance of the two ellipses shall be d = c + 6 mm, where c is the pupillary distance. The pupillary distance is 64 mm for the medium head-form and 54 mm for the small head-form, if not specified differently by the manufacture. | | P |
| | The test shall be carried out in accordance with clause 18 of EN 168:2001.   | | P |
| **7.1.2** | **Optical requirements** | | P |
| **7.1.2.1** | **Spherical, astigmatic and prismatic refractive powers** | | P |
| | The refractive powers of oculars shall be measured by the reference methods specified in clause 3 ofEN 167:2001. This clause refers also to an optional method for use in specific circumstances; the details of this method are given in annex A of EN 167:2001. | | N/A |
| **7.1.2.1.1** | **Unmounted oculars covering one eye** | | N/A |
| | The refractive power characteristics of unmounted oculars covering one eye shall be measured by the method | | N/A |
| | The permissible tolerances for oculars without corrective effect are given in Table 2. | | N/A |
| | The permissible deviations for the vertex powers of oculars with corrective effect are specified in EN ISO 8980-1and EN ISO 8980-2. Oculars that comply with EN ISO 8980-1 and EN ISO 8980-2 shall be categorised as class 1.For class 2, the deviations in vertex refractions may be 0,06 m-1 higher than for class 1 | | N/A |
| | Table 2 – Permissible tolerances for refractive powers of unmounted oculars without corrective effect covering one eye | | N/A |

| Optical class | Spherical refractive power $(D_1+D_2)/2$ m$^{-1}$ | Astigmatic refractive power $\lvert D_1-D_2\rvert$ m$^{-1}$ | Prismatic refractive power cm/m |
|---|---|---|---|
| 1 | ± 0,06 | 0,06 | 0,12 |
| 2 | ± 0,12 | 0,12 | 0,12 |
| NOTE $D_1$ and $D_2$ are the refractive powers in the two principal meridians. | | | |

| EN 166 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| **7.1.2.1.2** | **Mounted oculars and unmounted oculars covering both eyes** | | N/A |
| | The refractive power characteristics of mounted oculars or unmounted oculars covering both eyes shall be measured by the method specified in 3.2 of EN 167:2001 at the visual centre of the ocular. | | N/A |
| | The permissible tolerances for oculars without corrective effect are given in Table 3. | | N/A |
| | The permissible deviations for vertex powers of oculars with corrective effect are as defined in 7.1.2.1.1. Deviations that would correspond to class 3 shall not be permitted. | | N/A |
| NOTE | The difference in prismatic refractive power specified for an eye-protector depends not only on the prismatic | | P |
| |  | | P |
| **7.1.2.1.3** | **Cover plates** | | N/A |
| | The refractive powers of cover plates shall comply with the tolerances for optical class 1 given in Tables 2 and 3. | | N/A |
| **7.1.2.2** | **Transmittance** | | N/A |
| **7.1.2.2.1** | **Oculars without filtering action** | | N/A |
| | Oculars intended to protect the eyes against mechanical or chemical hazards only, and cover plates, shall have a luminous transmittance greater than 74,4 % when measured as given in clause 6 of EN 167:2001 (based on CIE source A (2856 K)). | | N/A |
| **7.1.2.2.2** | **Oculars with filtering action (filters) and housings for oculars with filtering action.** | | P |
| | The transmittance of oculars with filtering action shall meet the requirements given in the specific standards relating to the various types of ocular (see 7.2.1). | | P |
| | Goggles and face-shields which claim to provide protection against optical radiation shall provide at least the same | | P |
| 7.1.2.2.3 | Variations in transmittance (Oculars without filtering action are exempt from this requirement) | | P |
| 7.1.2.2.3.1 | Oculars without corrective effect | | P |

| Optical class | Spherical refractive power $(D_1+D_2)/2$ m$^{-1}$ | Astigmatic refractive power $\lvert D_1-D_2\rvert$ m$^{-1}$ | Difference in prismatic refractive power cm/m | | |
|---|---|---|---|---|---|
| | | | Horizontal | | Vertical |
| | | | Base out | Base in | |
| 1 | ± 0,06 | 0,06 | 0,75 | 0,25 | 0,25 |
| 2 | ± 0,12 | 0,12 | 1,00 | 0,25 | 0,25 |
| 3 | + 0,12 − 0,25 | 0,25 | 1,00 | 0,25 | 0,25 |

NOTE $D_1$ and $D_2$ are the refractive powers in the two principal meridians. For optical class 3 the axes of the principal meridians shall be parallel within ± 10°.

| EN 166 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Variations in luminous transmittance shall be measured in accordance with clause 7 of EN 167:2001. | | N/A |
| | The relative variations of the luminous transmittance around the visual centre(s) P1 (and P2) shall not exceed the values of Table 4. | | N/A |
| | The relative difference in luminous transmittance P3 between left and right eye shall not exceed the values of Table 4 or 20 % whichever is greater. | | N/A |
| | <table><tr><th colspan="2">Luminous transmittance</th><th>Permissible relative variation</th></tr><tr><th>less than %</th><th>up to %</th><th>%</th></tr><tr><td>100</td><td>17,8</td><td>± 5</td></tr><tr><td>17,8</td><td>0,44</td><td>± 10</td></tr><tr><td>0,44</td><td>0,023</td><td>± 15</td></tr><tr><td>0,023</td><td>0,0012</td><td>± 20</td></tr><tr><td>0,0012</td><td>0,000023</td><td>± 30</td></tr></table> | | N/A |
| **7.1.2.2.3.2** | **Oculars with corrective effect (prescription oculars)** | | P |
| | The requirements of 7.1.2.2.3.1 shall also apply to prescription oculars, with the provision that variations in luminous transmittance which are due to thickness variations inherent in the design of the ocular are not taken into account, providing the luminous transmittance at no point deviates by more than a factor of 2,68 (one shade number) from its value at the visual centre. | | P |
| | The IR and UV transmittance shall meet the requirements of the specified shade number at every point on the ocular. | | P |
| **7.1.2.3** | **Diffusion of light** | | P |
| | The diffusion of light shall be measured in accordance with one of the reference methods specified in clause 4 of EN 167:2001. | | P |
| | $1{,}00\,\frac{cd}{m^2 \cdot lx}$ for welding filters;<br>$0{,}75\,\frac{cd}{m^2 \cdot lx}$ for oculars used in eye-protectors against high speed particles;<br>$0{,}50\,\frac{cd}{m^2 \cdot lx}$ for all other oculars. | | P |
| **7.1.3** | **Quality of material and surface** | | N/A |
| | Except for a marginal area 5 mm wide, oculars shall be free from any significant defects likely to impair vision in use, such as bubbles, scratches, inclusions, dull spots, pitting, mould marks, scouring, grains, pocking, scaling and undulation. | | N/A |
| | The assessment shall be carried out in accordance with the method specified in clause 5 of EN 167:2001. | | N/A |
| **7.1.4** | **Robustness** | | N/A |
| **7.1.4.1** | **Minimum robustness** | | N/A |

| EN 166 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | This requirement relates only to cover plates and oculars with filtering effect and need not be assessed if these items are intended to meet the requirements for increased robustness or resistance to high speed particles, in which case the requirements of 7.1.4.2 or 7.2.2 shall be met. | | N/A |
| | The requirement for minimum robustness is satisfied if the ocular withstands the application of a 22 mm nominal diameter steel ball with a force of (100 ± 2) N, when tested in accordance with clause 4 of EN 168:2001. | | N/A |
| | a) ocular fracture : an ocular shall be considered to have fractured if it cracks through its entire thickness into two<br>or more pieces, or if more than 5 mg of the ocular material becomes detached from the surface away from the<br>one in contact with the ball, or if the ball passes through the ocular; | | N/A |
| | b) ocular deformation : an ocular shall be considered to have been deformed if a mark appears on the white<br>paper on the opposite side to the one on which the force is applied. | | N/A |
| **7.1.4.2** | **Increased robustness** | | P |
| **7.1.4.2.1** | **Unmounted oculars** | | P |
| | The oculars shall withstand the impact of a 22 mm nominal diameter steel ball, of 43 g minimum mass, striking the ocular at a speed of approximately 5,1 m/s, when tested in accordance with 3.1 of EN 168:2001 | | N/A |
| | On so testing the following defects shall not occur: | | P |
| | a) ocular fracture : an ocular shall be considered to have fractured if it cracks through its entire thickness into two or more pieces, or if more than 5 mg of the ocular material becomes detached from the surface away from the one struck by the ball, or if the ball passes through the ocular; | | P |
| | b) ocular deformation : an ocular shall be considered to have been deformed if a mark appears on the white<br>paper on the opposite side to that struck by the ball. | | P |
| **7.1.4.2.2** | **Complete eye-protectors and frames** | | P |
| | The complete eye-protector or frame shall withstand the lateral and frontal impacts of a steel ball striking at a specified speed. | | |
| | The diameter of the steel ball and the corresponding impact speed are given in Table 5. | | P |

| EN 166 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

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|---|---|---|---|
| | Table 5 — Requirements relating to increased robustness of complete eye-protectors<br>Spectacles / Goggles / Face-shields; Size, mass and speed of steel ball; Frontal impact; Lateral impact; Frontal impact; Lateral impact<br>22 mm nominal diameter steel ball, of 43 g minimum mass, at a speed of approximately 5,1 m/s: √ √ √ √ √ | | P |
| | The test shall be in accordance with the method specified in 3.2 of EN 168:2001. | | P |
| | If a spectacle is claimed to have lateral protection it shall not be possible for the ball to strike the lateral impact points without first striking the lateral protection. | | P |
| | On so testing the following defects shall not occur: | | P |
| | a) ocular fracture : an ocular shall be considered to have fractured if it cracks through its entire thickness into two or more pieces, or if more than 5 mg of the ocular material becomes detached from the surface away from the one struck by the ball, or if the ball passes through the ocular; | | P |
| | b) ocular deformation : an ocular shall be considered to have been deformed if a mark appears on the white paper on the opposite side to that struck by the ball; | | P |
| | c) ocular housing or frame fracture : an ocular housing or frame shall be considered to have failed if it separates into two or more pieces, or if it is no longer capable of holding an ocular in position, or if an unbroken ocular detaches from the frame, or if the ball passes through the housing or frame; | | P |
| | d) lateral protection failure : the lateral protection shall be considered to have failed if it fractures through its entire thickness into two or more separate pieces, or if one or more particles become detached from the surface remote from the impact point, or if it allows the ball to penetrate completely, or if it partially or totally detaches<br>from the eye-protector, or if its component parts become separated. | | P |
| **7.1.5** | **Resistance to ageing** | | N/A |
| | Cover plates and glass oculars are exempt from these tests. The exemption does not apply to coated or laminated glass. | | N/A |
| **7.1.5.1** | **Stability at an elevated temperature** | | P |
| | Assembled eye-protectors shall show no apparent deformation when tested by the method specified in clause 5 of EN 168:2001. | | P |

| EN 166 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| **7.1.5.2** | **Resistance to ultraviolet radiation (oculars only)** | | N/A |
| | Oculars shall be subjected to the test for resistance to ultraviolet radiation in accordance with the method specified in clause 6 of EN 168:2001. | | N/A |
| | At the end of the test, oculars shall meet the following requirements. | | N/A |
| | a) The relative change of luminous transmittance shall not be greater than the values specified in Table 6.If for welding filters the relative change of the luminous transmittance is larger than the values specified in Table 6 but the actual value of luminous transmittance remains within the range specified by its shade number,a second irradiation is performed in accordance with clause 6 of EN 168:2001 on the same sample. The relative change of luminous transmittance due to the second irradiation shall not be greater than the values specified in Table 6 and the actual value of luminous transmittance shall remain within the range specified by its shade number; | | N/A |
| | b) The value of the reduced luminance factor shall not exceed the permissible limits given in 7.1.2.3. | | N/A |
| | Table 6 — Permissible relative change in luminous transmittance following the ultraviolet radiation test<br>Luminous transmittance (less than % / up to %) / Permissible relative change %<br>100 / 17,8 / ± 5<br>17,8 / 0,44 / ± 10<br>0,44 / 0,023 / ± 15<br>0,023 / 0,0012 / ± 20<br>0,0012 / 0,000023 / ± 30 | | N/A |
| **7.1.6** | **Resistance to corrosion** | | P |
| | After having undergone the test for resistance to corrosion specified in clause 8 of EN 168:2001, all metal parts of the eye-protector shall display smooth surfaces, free from corrosion, when they are examined by a trained observer. | | P |
| **7.1.7** | **Resistance to ignition** | | P |
| **7.2** | **Particular requirements** | | P |
| **7.2.1** | **Protection against optical radiation** | | P |
| **7.2.1.1** | **Welding filters** – see EN 169. | | N/A |
| **7.2.1.2** | **Ultraviolet filters** – see EN 170. | | N/A |
| **7.2.1.3** | **Infrared filters** – see EN 171. | | N/A |
| **7.2.1.4** | **Sunglare filters for industrial use** – see EN 172. | | N/A |
| **7.2.1.5** | **Welding Filters with switchable luminous transmittance** - see EN 379. | | N/A |

| EN 166 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

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|---|---|---|---|
| **7.2.2** | **Protection against high-speed particles** | | P |
| | Eye-protectors intended to provide protection against high-speed particles shall withstand the impact of a 6 mm nominal diameter steel ball of 0,86 g minimum mass, striking the oculars and the lateral protection at one of the speeds given in Table 7. | | P |
| | Eye-protectors for protection against high-speed particles shall also meet the requirements for increased robustness given in 7.1.4.2. | | P |
| | Table 7 — Requirements relating to protection against high-speed particles<br>Type of eye-protector / Impact speed of ball: Low energy impact (F) $45^{+1,5}_{-0}$ m/s; Medium energy impact (B) $120^{+3}_{-0}$ m/s; High energy impact(A) $190^{+5}_{-0}$ m/s<br>Spectacles: + / Not applicable / Not applicable<br>Goggles: + / + / Not applicable<br>Face-shields: + / + / + | | P |
| | The test shall be in accordance with the method specified in clause 9 of EN 168:2001. | | P |
| | It shall not be possible for the ball to strike the lateral impact point without first striking the lateral protection. | | P |
| | On so testing the following defects shall not occur: | | P |
| a) | ocular fracture : an ocular shall be considered to have fractured if it cracks through its entire thickness into two or more pieces, or if more than 5 mg of the ocular material becomes detached from the surface away from the one struck by the ball, or if the ball passes through the ocular; | | P |
| b) | ocular deformation : an ocular shall be considered to have been deformed if a mark appears on the white paper on the opposite side to that struck by the ball; | | P |
| c) | ocular housing or frame failure : an ocular housing or frame shall be considered to have failed if it separates into two or more pieces, or if it is no longer capable of holding an ocular in position, or if an unbroken ocular detaches from the frame, or if the ball passes through the housing or frame; | | P |
| d) | lateral protection failure : the lateral protection shall be considered to have failed if it fractures through its entire thickness into two or more separate pieces, or if one or more particles becomes detached from the surface remote from the impact point, or if it allows the ball to penetrate completely, or if it partially or totally detaches from the eye-protector, or if its component parts become separated. | | P |

| EN 166 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Eye-protectors offering protection against high-speed particles must provide lateral protection (see 7.2.8). | | P |
| **7.2.3** | **Protection against molten metals and hot solids** | | P |
| | Eye-protectors intended to provide protection against molten metals and hot solids shall be considered to be satisfactory if: | | P |
| a) | the eye-protector is either a goggle or a face-shield; | | P |
| b) | the viewing area of oculars for face-shields has a minimum vertical centre-line depth of 150 mm when mounted in the appropriate housing; | | P |
| c) | face-shields cover the eye-region rectangle of the appropriate head-form as assessed in accordance with 10.2 of EN 168:2001; | | P |
| d) | the eye-protector satisfies the requirements for one of the three impact energy categories given in 7.2.2; | | P |
| e) | when tested and assessed in accordance with 10.1 of EN 168:2001 they prevent the adherence of molten metal to the portion of the eye-protector which affords protection to the eye-region rectangle ABCD shown in Figure 11 of EN 168:2001; | | P |
| f) | complete penetration of oculars for goggles, and all types of frames, housings, browguards, etc. does not occur within 7 s when tested as described in clause 11 of EN 168:2001; | | P |
| g) | complete penetration of oculars for face-shields does not occur within 5 s when tested as described in clause 11 of EN 168:2001. | | P |
| **7.2.4** | **Protection against droplets and splashes of liquids** | | P |
| | Eye-protectors for use against droplets (goggles) and splashes of liquids (face-shields) shall be tested in accordance with the methods specified in clause 12 of EN 168:2001. The results shall be considered to be satisfactory if: | | P |
| a) | no pink or crimson colouration appears in the ocular regions defined by the two circles when assessing goggles for protection against droplets. No account shall be taken of any such colouration up to a distance of 6 mm inside the edges of the eye-protector; | | P |
| b) | face-shields cover the eye-region rectangle of the appropriate head-form as described in 10.2.2.2 of EN 168:2001 as assessed in accordance with 10.2 of EN 168:2001. | | P |
| | Additionally, face-shields for protection against splashes of liquids shall have a viewing area with a minimum vertical centre-line depth of 150 mm when mounted in the appropriate housing. | | P |

| EN 166 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **7.2.5** | **Protection against large dust particles** | | P |
| | Eye-protectors for use against large dust particles shall be tested in accordance with the method specified in clause 13 of EN 168:2001. The result shall be considered to be satisfactory if the reflectance after the test is not less than 80 % of its value before the test. | | P |
| **7.2.6** | **Protection against gases and fine dust particles** | | N/A |
| | Eye-protectors for use against gases and fine dust particles shall be tested in accordance with the method specified in clause 14 of EN 168:2001. They shall be regarded as satisfactory if no pink or crimson colorationappears in the area covered by the eye-protector. No account shall be taken of any such coloration up to a distance of 6 mm inside the edges of the eye-protector. | | N/A |
| **7.2.7** | **Protection against short circuit electric arc** | | P |
| | Eye-protectors for protection against short circuit electric arc shall be face-shields only. They shall have no exposed metal parts and all external edges of the protector shall be radiussed, chamfered or otherwise treated to eliminate sharp edges.Face-shields shall satisfy the requirements for area of coverage defined in clause 6.2.4 (b) and shall have a viewing area with a minimum vertical centre line depth of 150 mm when mounted in the appropriate housing. | | P |
| **7.2.8** | **Lateral Protection** | | P |
| | Eye-protectors claimed to provide lateral protection shall pass the lateral region coverage assessment detailed in clause 19 of EN 168:2001. | | P |
| **7.3** | **Optional requirements** | | P |
| | Optional requirements are specified for additional characteristics of eye-protectors which may be found to be beneficial to the user for operational reasons. | | P |
| **7.3.1** | **Resistance to surface damage by fine particles** | | P |
| | If oculars are described as resistant to surface damage by fine particles they shall have a reduced luminance factorof not more than $5\frac{cd}{m^2 \cdot lx}$ following the test specified in clause 15 of EN 168:2001. | | P |
| NOTE | This procedure does not assess resistance to abrasion. | | -- |
| **7.3.2** | **Resistance to fogging of oculars** | | P |
| | If oculars are described as resistant to fogging they shall remain free from fogging for a minimum of 8 s when tested in accordance with clause 16 of EN 168:2001. | | P |

| EN 166 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| NOTE | This procedure does not assess resistance to fogging of the complete eye-protector. | | -- |
| **7.3.3** | **7.3.3 Oculars with enhanced reflectance in the infrared** | | N/A |
| | Oculars which are claimed to have enhanced reflectance in the infrared shall have a mean spectral reflectance greater than 60 % within the wavelength range 780 nm to 2 000 nm when measured in accordance with clause 8 of EN 167:2001. | | N/A |
| **7.3.4** | **Protection against high speed particles at extremes of temperature** | | N/A |
| | Eye-protectors intended to provide protection against high-speed particles at extremes of temperature shall withstand the impact of a 6 mm nominal diameter steel ball of 0,86 g minimum mass, striking the oculars and the lateral protection at one of the speeds given in Table 7. The impacts are carried out after the eye-protectors have been conditioned at extremes of temperature ((55 ± 2) °C and (-5 ± 2) °C) using the method specified in clause 9 of EN 168:2001. | | N/A |
| | It shall not be possible for the ball to strike the lateral impact point without first striking the lateral protection. | | N/A |
| | On so testing the following defects shall not occur: | | N/A |
| a) | ocular fracture : an ocular shall be considered to have fractured if it cracks through its entire thickness into two or more pieces, or if more than 5 mg of the ocular material becomes detached from the surface away from the one struck by the ball, or if the ball passes through the ocular; | | N/A |
| b) | ocular deformation : an ocular shall be considered to have been deformed if a mark appears on the white paper on the opposite side to that struck by the ball; | | N/A |
| c) | ocular housing or frame failure : an ocular housing or frame shall be considered to have failed if it separates into two or more pieces, or if it is no longer capable of holding an ocular in position, or if an unbroken ocular detaches from the frame, or if the ball passes through the housing or frame; | | N/A |

| EN 166 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| d) | lateral protection failure : the lateral protection shall be considered to have failed if it fractures through its entire thickness into two or more separate pieces, or if one or more particles becomes detached from the surface remote from the impact point, or if it allows the ball to penetrate completely, or if it partially or totally detaches from the eye-protector, or if its component parts become separated. | | N/A |
| NOTE | Eye-protectors offering protection against high speed particles at extremes of temperature must provide lateral<br>protection (see 7.2.8). | | -- |
| **8** | **Allocation of requirements, test schedules and application** | | P |
| **8.1** | **Requirements and test methods** | | P |
| | The requirements and test methods for oculars and complete eye-protectors are specified in various European Standards (see clause 2). It is the object of this clause to allocate the individual requirements and test methods to the different types of eye-protector.<br>Table 8 specifies those requirements and tests which apply to oculars.<br>Table 9 specifies those requirements and tests which apply to frames and complete eye-protectors. | | P |
| **8.2** | **Test schedules for type examination** | | P |
| | The necessary number of samples for type examination and the required order of the individual tests to be carried | | P |
| | out are shown in Table 10 (mounted and unmounted oculars) and Table 11 (frames and complete eye-protectors). | | P |
| **8.3** | **Application of eye-protector types** | | P |
| | The application of eye-protector types to the various fields of use is shown in Table 12. | | P |

| EN 166 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 1.1 | Design principles 6.1, 6.2, 6.3 | | P |
| 1.1.1 | Ergonomics 6.3, 7.1.1 | | P |
| 1.1.2 | Levels and classes of protection 7.1, 7.2, 7.3 | | P |
| 1.1.2.1 | Highest level of protection possible 7.1, 7.2, 7.3 | | P |
| 1.1.2.2 | Classes of protection appropriate to different levels of risk 7.1, 7.2, 7.3 | | P |
| 1.2.1.1 | Suitable constituent materials 6.2 | | P |
| 1.2.1.2 | Satisfactory surface condition of all PPE parts in contact with the user 6.1 | | P |
| 1.2.1.3 | Maximum permissible user impediment 6.3, 7.1.1 | | P |
| 1.3 | Comfort and efficiency 6.3, 7.1.1 | | P |
| 1.3.1 | Adaptation of PPE to user morphology 6.3, 7.1.1 | | P |
| 1.3.2 | Lightness and design strength 7.1.4, 7.2.2 | | P |
| 1.4 | Information supplied by the manufacturer 10 | | P |
| 2.1 | PPE incorporating adjustments systems 6.3 | | P |
| 2.3 | PPE for the face, eyes and respiratory tracts All | | P |
| 2.4 | PPE subject to ageing 7.1.5 | | P |
| 2.9 | PPE incorporating components which can be adjusted or removed by the user 6.3, 9.2.8 | | P |

| EN 166 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 2.12 | PPE bearing one or more identification marks directly or indirectly relating to health and safety 9 | | P |
| 2.14 | Multi-risk PPE All | | P |
| 3.1 | Protection against mechanical impact 7.1.4, 7.2.2 | | P |
| 3.1.1 | Impact caused by falling or projecting objects and collision of parts of the body with an obstacle. 7.1.4, 7.2.2 | | P |
| 3.9 | Radiation protection 7.2.1 | | P |

*attachment : Photo Documents*

## Appendix 1
## Photo documentation

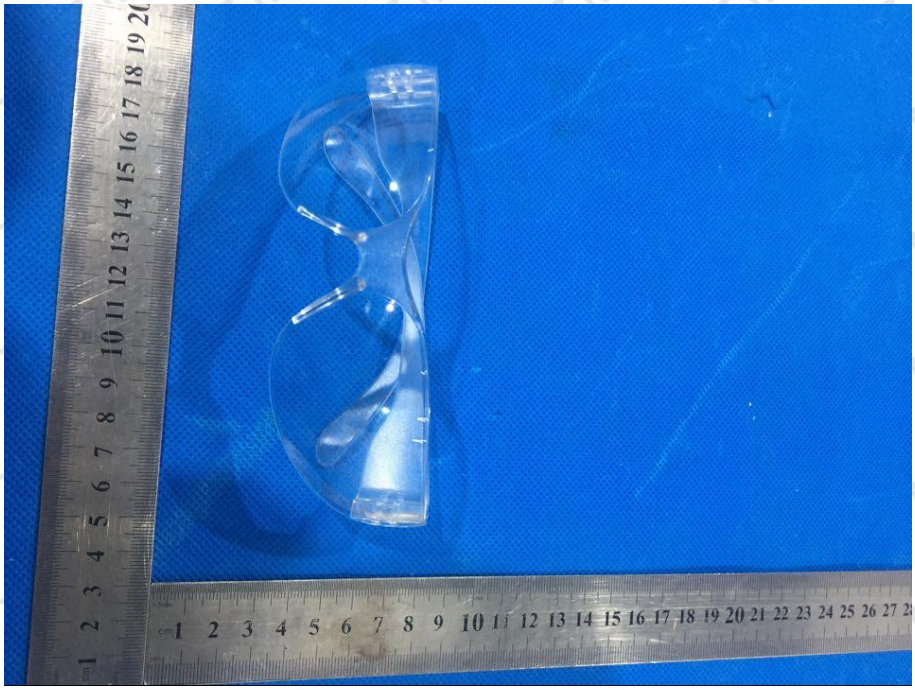

Fig.1

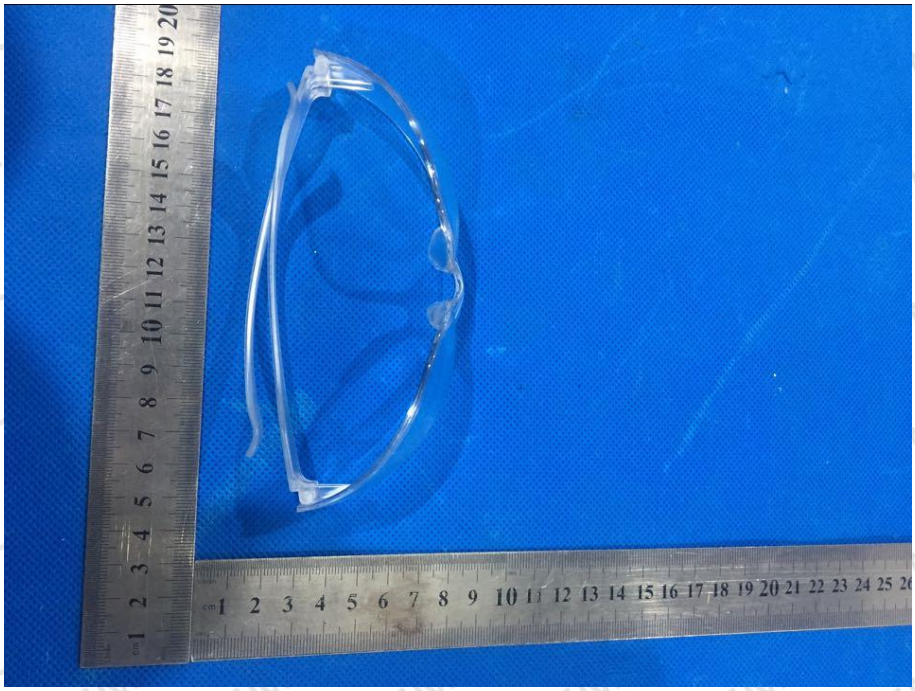

Fig.2

***attachment : Photo Documents***

Fig.3

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