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TEST REPORT

Client:	BOLLE' PROTECTION
Address:	34 rue de la Soie - 69 100 VILLEURBANNE FRANCE
Article:	Faceshield
Model:	Model DFS-2
Job no.:	C200589
Report no.:	201839
Receiving Date:	24/04/2020
Date of Test Begin:	24/04/2020
Date of Test End:	04/05/2020
Issuing Date:	05/05/2020
Standard Applied:	EN 166:2001 - Personal eye-protection - Specifications

Note 1: This test report is valid only for the tested samples and any changes can be made only with the issuance of a new test report.
Note 2: The partial reproduction of this test report is forbidden without written permission of Certottica.
Note 3: The tests were performed on samples sent by client.
Note 4: This test report is an official document digitally signed according to the current italian law.
Note 5: If not otherwise stated, the declared uncertainty must be intended as extended uncertainty with a 95% confidence level and a cover factor k = 2.
Note 6: The assessment of conformity of the quantitative results to the standards or to the disciplinary applied includes the measurement uncertainty: if the result +/- the uncertainty is within the limit, then the product is compliant; if it does NOT return, the product is NOT compliant.

Optical Tests

Quality of material and surface

Clause 7.1.3

Requirements

Except for a marginal area 5 mm wide, oculars shall be free from any significant defects likely to impair vision in use.

Outcomes

Sample	Defects	Test
201839 4dx	—	Pass
201839 4sx	—	Pass
201839 5dx	—	Pass
201839 5sx	—	Pass
201839 6dx	—	Pass
201839 6sx	—	Pass

Diffusion of light

Clause 7.1.2.3

Requirements

The measurement of the reduced luminance factor is performed following the method stated in the EN167 Clause 4.2.1 (basic method). The reduced luminance factor shall be not superior than 1 $\mathrm{cd\,m^{-2}\,lx^{-1}}$ for welding filters, 0.75 $\mathrm{cd\,m^{-2}\,lx^{-1}}$ for oculars used in eye-protectors against high speed particles, 0.5 $\mathrm{cd\,m^{-2}\,lx^{-1}}$ for all other oculars.

Outcomes

Sample	ℓ^* ($\mathrm{cd\,m^{-2}\,lx^{-1}}$)	Test
201839 4dx	0.09	Pass
201839 4sx	0.11	Pass
201839 5dx	0.12	Pass
201839 5sx	0.15	Pass
201839 6dx	0.10	Pass
201839 6sx	0.24	Pass

Transmittance

Clause 7.1.2.2

Oculars without filtering action

Clause 7.1.2.2.1

Luminous Transmittance

Requirements

Luminous Transmittance, T_V, shall have a luminous transmittance greater than 74.4 %.

Outcomes

The T_V measurement values in percent and relative tests are:

Sample	T_V(%)	Test
201839 4sx	89.4	Pass
201839 4dx	89.2	Pass
201839 5sx	88.9	Pass
201839 5dx	89.0	Pass
201839 6sx	89.3	Pass
201839 6dx	89.3	Pass

Resistance to ultraviolet radiation (oculars only)

Clause 7.1.5.2

Requirements

The external surface of the filters is exposed to radiation of a 450 W Xenon lamp. The exposure time is 50 h, the distance between filter and lamp is 300 mm, and the test equipment operate at environment temperature of 23 °C ± 5 °C.
The absolute value of the relative variation of T_V after radiation shall not be greater than the values specified in Table 6 of EN166.
Measurement value of ℓ^* after radiation shall be not higher than 1 $\mathrm{cd\,m^{-2}\,lx^{-1}}$, 0.75 $\mathrm{cd\,m^{-2}\,lx^{-1}}$, 0.5 $\mathrm{cd\,m^{-2}\,lx^{-1}}$ respectively for welding filters, ocular for protection against high-speed particles, for all other type of oculars.

Outcomes

Measurement values of T_V and ℓ^* after irradiation, the relative variation of T_V and the test results are:

Sample	T_V(%)	$\Delta T_V/T_V$(%)	Test	ℓ^* ($\mathrm{cd\,m^{-2}\,lx^{-1}}$)	Test
201839 4sx	88.9	-1	Pass	0.12	Pass
201839 5dx	88.9	0	Pass	0.12	Pass
201839 6sx	88.5	-1	Pass	0.08	Pass

Spherical, astigmatic and prismatic powers

Clause 7.1.2.1

Note: The refractive powers of cover plates (see Clause 7.1.2.1.3 of the standard) shall comply with the tolerances for optical class 1 given in Tables 2 and 3 of the standard. The test results in the case of the cover plates here reported are relative to the optical class 1 requirements.

Mounted oculars and unmounted oculars covering both eyes

Clause 7.1.2.1.2

Requirements

Note: The refractive powers of cover plates shall comply with the tolerances for optical class 1 given in Tables 2 and 3 of the standard.

Outcomes

Sample	Sph. Refr. Pow. (D)	Test	Ast. Refr. Pow. (D)	Test
201839 1dx	-0.02	Pass	0.02	Pass
201839 1sx	-0.01	Pass	0.02	Pass
201839 2dx	-0.01	Pass	0.02	Pass
201839 2sx	-0.01	Pass	0.02	Pass
201839 3dx	-0.01	Pass	0.01	Pass
201839 3sx	-0.01	Pass	0.02	Pass

Requirements

Note: The refractive powers of cover plates shall comply with the tolerances for optical class 1 given in Tables 2 and 3 of the standard.

Outcomes

Measurement values of the differences of the horizontal and vertical refractive prismatic powers, the base, the relative tests and the optical class[1], are:

Sample	Base	Horiz. Prism. Diff. (cm/m)	Test	Vert. Prism. Diff. (cm/m)	Test	Optical Class
201839 1	out	0.10	Pass	0.00	Pass	One
201839 2	out	0.10	Pass	0.00	Pass	One
201839 3	out	0.10	Pass	0.00	Pass	One

Stability at an elevated temperature

Clause 7.1.5.1

Requirements

The protective equipment conditioned at the temperature of 55 °C ± 5 °C for 60 min ± 5 min, after 60 min at the environment temperature shall show no apparent deformation.

Outcomes

The test has given the following results:

Sample	Deformations	Test
201839 1	—	Pass
201839 2	—	Pass
201839 3	—	Pass

Mechanical Tests

General construction

Clause 6.1

[1]The optical class is established on the basis of the results obtained for the individual lenses and the prismatic power differences.

Requirements

Eye-protectors shall meet the general construction requirements consisting in being free from projections, sharp edges or other defects which can cause discomfort or injury during normal use.

Outcomes

Specimen	Notes	Test
201839 1	—	Pass
201839 2	—	Pass
201839 3	—	Pass

Headbands

Clause 6.3

Requirements

Headbands, when used as the principal means of retention, shall be at least 10 mm wide. Minimum wideness must be not less than 10 mm.

Outcomes

Specimen	Minimum Wideness (mm)	Test
201839 1	19.6	Pass
201839 2	19.6	Pass
201839 3	19.6	Pass

Field of vision

Clause 7.1.1

Requirements

Eye-protector shall has a field of vision including for each eye the field defined by a cone having its vertex in the pupil and such to forms an ellipse with its section on a 25 mm distant plane parallel to the two pupils and orthogonal to the horizontal sight axis. The ellipses have the following geometric features: horizontal axis 22 mm, vertical axis 20 mm. The horizontal axis shall be parallel to and 0.7 mm below the height of the line connecting the centres of the two eyes; the horizontal displacement of the ellipse's centre is 3 mm toward the external eye side.

Outcomes

The performed tests have given the following results:

Specimen	Notes	Test
201839 1	—	Pass
201839 2	—	Pass
201839 3	—	Pass

Resistance to ignition

Clause 7.1.7

Requirements

The several external parts of the test sample except elastic headbands and textile edging, are put into direct contact for 5 s ± 0.5 s with a steel bar risen to the temperature of 650 °C ± 20 °C. During the test, a visual exam is performed to establish if the test sample ignite or continue to glow after the removal of the steel bar.

Outcomes

The visual exam has given the following results:

Sample	Notes	Test
201839 10	—	Pass
201839 11	—	Pass
201839 12	—	Pass

Protection against droplets and splashes of liquids

Clause 7.2.4

Requirements

Note: The test is intended for face-shields and goggles. The face-shields to wear shall comply with the covering surface test.
After the test as described on EN168 Clause12, colouring of the paper shall not appear in the ocular region. Any colouration of the paper up to a distance of 6 mm inside the edge of the eye-protector shall not be considered.
The face-shield must has a 150 mm vertical depth

Outcomes

The presence or the absence of colour in the ocular region, the vertical depth of the face-shield (if it is applicable) and the final result are reported as follows:

Sample	Colouration	Coverage	Vertical Depth (mm)	Test
201839 34	—	Present	188	Pass
201839 35	—	Present	188	Pass
201839 36	—	Present	188	Pass

Resistance to fogging of oculars

Clause 7.3.2

Requirements

Note: This test does not assess resistance to fogging of the complete of the complete eye-protector.
The oculars shall remain free from fogging for a minimum of 8 s when tested according to clause 16 of EN 168:2001.

Outcomes

The tested samples have given the following results:

Sample	Time (s)	Test
201839 37sx	3	**FAIL**
201839 38dx	2	**FAIL**
201839 39sx	2	**FAIL**
201839 40dx	2	**FAIL**

Figure 1: Specimen picture.

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END OF TEST REPORT