
Specifikacija za samozatemnitvene filtre in za filtre z dvojnimi prepustnim območjem za varjenje

Specification for welding filters with switchable luminous transmittance and welding filters with dual luminous transmittance

Anforderungen an Schweißerschutzfilter mit umschaltbarem Lichttransmissionsgrad und Schweißerschutzfilter mit zwei Lichttransmissionsgraden

Spécifications concernant les filtres de soudage avec facteur de transmission dans le visible commutable et les filtres de soudage avec double facteur de transmission dans le visible

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Ta slovenski standard je istoveten z: EN 379:1994

ICS:

13.340.20	Varovalna oprema za glavo	Head protective equipment
25.160.01	Varjenje, trdo in mehko spajkanje na splošno	Welding, brazing and soldering in general

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en

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EUROPEAN STANDARD

EN 379

NORME EUROPÉENNE

EUROPÄISCHE NORM

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Descriptors: Safety, accident prevention, eyes, filters, welding, specifications, transmittance, dimensions, tests, marking

English version

**Specification for welding filters with switchable
luminous transmittance and welding filters with
dual luminous transmittance**

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 85 "Eye-protective equipment" of which the secretariat is held by AFNOR.

This European Standard has been prepared under a mandate given to CEN by the European Communities and the European Free Trade Association, and supports essential requirements of EC Directive(s).

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 1994, and conflicting national standards shall be withdrawn at the latest by July 1994.

In accordance with the CEN/CENELEC Internal Regulations, following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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1 Scope

This standard specifies requirements for welding filters which automatically switch their luminous transmittance to a lower value when a welding arc is ignited (referred to as welding filters with switchable scale numbers). The requirements of this standard apply if such a filter is to be used for continuous viewing of the welding process and if it is to be used only during the period when the arc is being ignited.

This standard also specifies requirements for welding filters with zones of differing luminous transmittance (referred to as welding filters with dual scale number).

These filters are used in welders' eye protectors (as specified in standards in preparation) or are fixed to equipment.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 165	Personal eye protection - Vocabulary ¹⁾ SIST EN 379:1996
EN 166	Personal eye protection - Fundamental specifications ¹⁾ https://standards.iteh.ai/catalog/standards/sist/en-379-1996
EN 167	Personal eye protection - Optical test methods ¹⁾
EN 168	Personal eye protection - Non-optical test methods ¹⁾
EN 169	Personal eye protection - Filters for welding and related processes - Transmittance requirements and recommended applications ¹⁾
EN 175	Personal eye-protection - Equipment for eye and face protection during welding and allied processes (excluding hoods) ¹⁾
ISO/CIE 10526	CIE standard colorimetric illuminants

3 Definitions

For the purposes of this European Standard the definitions given in EN 165 apply together with the following:

3.1 Welding filter with switchable scale number: A protective filter which automatically switches its scale number from a lower value (light state scale number) to a higher value (dark state scale number) when the welding arc is ignited.

¹⁾ at drafting stage

3.2 Welding filter with dual scale number: A protective filter with two different scale numbers (light and dark zones) which are divided into a maximum of three areas of the filter. The light zone is used for brief viewing when setting the electrode to the weld and igniting it. The dark zone is used for viewing the welding process.

3.3 Light state scale number: The scale number corresponding to the maximum value of luminous transmittance τ_1 .

3.4 Dark state scale number: The scale number corresponding to the minimum value of luminous transmittance τ_2 .

3.5 Switching time: The time dependence of luminous transmittance is described by function $\tau(t)$.

The switching time t_s is defined by the following integral:

$$t_s = \frac{1}{\tau_1} \int_{t=0}^{t=t(\tau=3\tau_2)} \tau(t) dt$$

where:

$t = 0$ is the time at which the arc ignites;

$t = t(\tau = 3\tau_2)$ is the time at which the luminous transmittance falls to three times the luminous transmittance in the dark state.

NOTE: In the case of short term exposure to light, the glare is approximately proportional to the product of the illuminance at the eye and time. The time relationship of the darkening process can be very different depending on the construction of the welding filter with switchable scale number. It is therefore appropriate to define the switching time as an integral of the luminous transmittance over time and not merely by the initial and final luminous transmittances.

4 Requirements

4.1 General requirements

Welding filters with switchable scale number and welding filters with dual scale number shall comply with the requirements given in table 1.

Table 1: General requirements

Property	General requirements for welding filters with switchable scale number	General requirements for welding filters with dual scale number
Spherical, astigmatic and prismatic refractive powers	As specified in 7.1.2.1.2 of EN 166	As specified in 7.1.2.1.2 of EN 166
Variations in luminous transmittance	As specified in 4.3.3	As specified in 7.1.2.2.3 of EN 166
Diffusion of light	As specified in 4.3.7	As specified in 7.1.2.3 of EN 166
Quality of material and surface	As specified in 7.1.3 of EN 166	As specified in 7.1.3 of EN 166
Robustness of construction	As specified in 7.1.4 of EN 166	As specified in 7.1.4 of EN 166
Stability at elevated temperature	As specified in 7.1.5.1 of EN 166	As specified in 7.1.5.1 of EN 166
Resistance to ultraviolet radiation	As specified in 7.1.4.2 of EN 166, but replacing 7.1.5.2 b) by 4.3.7 of this European standard	As specified in 7.1.5.2 of EN 166
Resistance to ignition	As specified in 7.1.8 of EN 166	As specified in 7.1.8 of EN 166

4.2 Particular requirements

Where a manufacturer wishes to claim compliance with particular requirements, these requirements shall be as specified in 7.2.2 to 7.2.7 of EN 166.

4.3 Additional requirements for welding filters with switchable scale numbers

4.3.1 Power off

When tested in accordance with 5.1, welding filters with switchable scale numbers shall be no more than nine scale numbers lighter than the highest scale number in the dark state.

4.3.2 Transmittance

4.3.2.1 The requirements of 4.3.2.2, 4.3.2.3 and 4.3.2.4 shall be satisfied when the transmittances are measured as described in clause 6 of EN 167.

4.3.2.2 The minimum luminous transmittance in the light state shall be 0,16 % when measured at both $(- 5 \pm 2)^\circ \text{C}$ and $(55 \pm 2)^\circ \text{C}$.

4.3.2.3 The luminous transmittance requirements given in table 1 of EN 169 and additional requirement d) in 4.1 of EN 169 shall apply to both light and dark states. The measurements shall be taken at both $(- 5 \pm 2)^\circ \text{C}$ and $(55 \pm 2)^\circ \text{C}$.

4.3.2.4 The spectral transmittance in the ultraviolet and the mean transmittance in the infrared as given in table 1 of EN 169 and the additional requirements a) to c) of 4.1 of EN 169 required for the dark state shall also apply to the light state. The measurements shall be taken at a temperature of $(23 \pm 5)^\circ \text{C}$.

4.3.3 Variations in luminous transmittance

When measured in accordance with 5.2 at a temperature of $(23 \pm 5)^\circ \text{C}$ the values P_1 , P_2 and P_3 of welding filters with switchable scale number shall not exceed the values in table 2 for the assigned class. This requirement shall apply to both light and dark states.

Table 2: Classification of oculars according to the maximum value of P_1 , P_2 or P_3

Values in percentage

Luminous transmittance in dark state		Maximum value of P_1 or P_2			Maximum value of P_3		
max.	min.	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3
100	17,8	5	10	15	20	20	20
17,8	0,44	10	15	20	20	20	20
0,44	0,023	15	20	30	20	20	30
0,023	0,0012	20	30	40	20	30	40
0,0012	0,000023	30	40	60	30	40	60

4.3.4 Switching times of welding filters with switchable scale number

4.3.4.1 The switching times shall satisfy either 4.3.4.2 or 4.3.4.3 for the darkest state.

Where the requirements of 4.3.4.2 are satisfied, no further marking is required.

Where the requirements of 4.3.4.3 are satisfied but the requirements of 4.3.4.2 are not satisfied, the warning notice

DO NOT USE BELOW 10° C

shall be permanently and legibly marked on the device.

4.3.4.2 The switching time shall be measured as described in 5.3 at temperatures of $(-5 \pm 2)^\circ\text{C}$ and $(55 \pm 2)^\circ\text{C}$. The switching time given in table 3 shall not be exceeded at either of these temperatures.

4.3.4.3 The switching time shall be measured as described in 5.3 at temperatures of $(10 \pm 2)^\circ\text{C}$ and $(55 \pm 2)^\circ\text{C}$. The switching time given in table 3 shall not be exceeded at either of these temperatures.

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