



Certificate No:
TAA000035Z

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Antiglare Sunscreens

with type designation(s)
SMOOTH

Issued to

Shanghai Endurance Technology Trading Co., Ltd.
Shanghai, China

is found to comply with

**ISO 8468:2007 Ships and marine technology – Ship's bridge layout and associated equipment –
Requirements and guidelines
DNV rules for classification – Ships**

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Issued at **Hamburg** on **2022-06-21**

This Certificate is valid until **2027-06-20**.

DNV local station: **Shanghai**

for **DNV**

Approval Engineer: **Michael Oberländer**

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Jörg Kallies
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Form code: TA 251

Revision: 2021-03

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Product description

SMOOTH is a sunscreen system with anti-glare roller screen films used as reflective shades for navigation bridge windows, manufactured in different sizes and with different film colours. It consists of an aluminium alloy frame and an electrophoretic film. The operation is manually via a pull rope and a tension spring.

	Film type code			
	SILVER P-HP13	Bronze P-HP08	Golden P-HP06	Gray P-HP05
%				
Visible Light Transmission (5% - 15%)	13%	11%	11%	10%
Glare Reduction (min. 80%)	83%	82%	85%	82%
Total Energy Rejection (min. 60%)	90%	85%	74%	72%
UV Transmission (max. 5%)	2%	2%	2%	2%

The reflective shades fulfil the requirements of ISO 8468:2007 4.3.6, IMO MSC/Circ.982 5.1.1.2.6 and IACS Rec.95 B6.5.1

Manufacturer of the films: Zhejiang Shichuang Optics Film Manufacturing Co.,Ltd.

Application/Limitation

Approved as reflective shades for use on navigation bridge windows.

Type Approval documentation

Tests carried out

Functional tests including:

- Testing of colour distortion, true colour rendition, examination of glare and reflection.
- Examination demonstrating fitness for purpose for both screens and mountings when installed, including adaptability of the screens.
- Witnessing of working practices and procedures.

Marking of product

The product or its packing is to be marked with type designation and name of the manufacturer.

Periodical assessment

DNV's surveyor is to be given permission to perform Periodical Assessments at any time during the validity of this certificate and at least every second year. The arrangement is to be in accordance with the procedure described in Class Programme DNV-CP-0338, Section 4.