Product Information

Substance H1 Patinal®

GENERAL INFORMATION

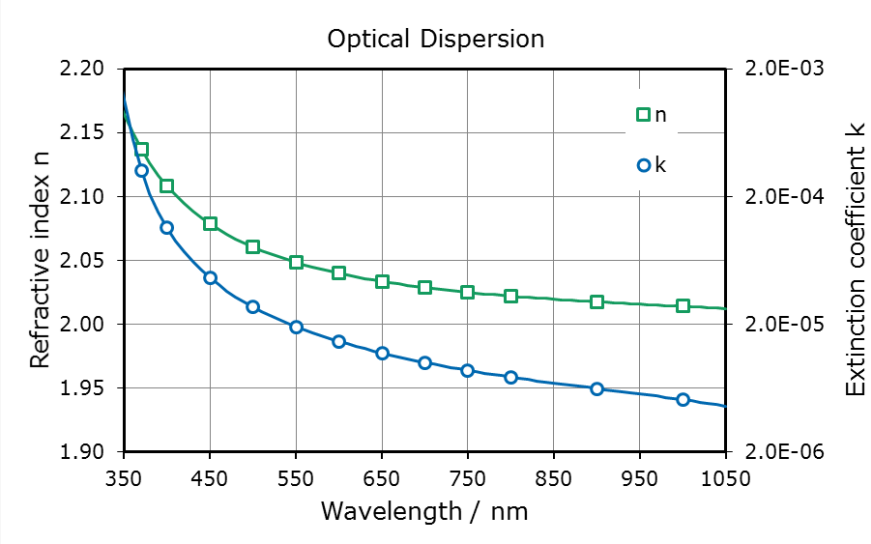
Substance H1 Patinal® is a titanium zirconium oxide mixture for high refractive index thin films. Compared to ZrO_2 the material melts and is therefore easier to evaporate and forms very homogeneous layers without a refractive index gradient.

AREAS OF APPLICATION

- AR and other multilayer coatings in the VIS and IR spectral range
- Coatings on plastic substrates.

THIN FILM PROPERTIES

Range of Transparency	350 nm – 7 µm
Refractive index at 500 nm	
• conventional T_s = 300 °C / no IAD	~ 2.1
Absorption edge	350 nm
Thin film stress	Tensile



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* EMD Performance Materials is a business of Merck KGaA, Darmstadt, Germany

wavl / nm	350	400	450	500	600	800	1000
n	2.16	2.11	2.08	2.06	2.04	2.02	2.01
k	1.1E-03	1.1E-04	4.6E-04	2.7E-05	1.5E-05	7.7E-06	5.2E-06

NOTES FOR EVAPORATION

Evaporator source	Electron beam evaporator
Liner	Copper crucible
Evaporation temperature	2200 – 2400 °C
Deposition rate	0.2 – 1.0 nm/s
Oxygen partial pressure	about $2 \cdot 10^{-4}$ mbar
Substrate temperature	30 - 300 °C
QCR-settings	Density 5.6 g/cm³, z-ratio 1.0

Substance H1 Patinal® can be evaporated by electron beam deposition directly from a water-cooled copper crucible. For optimum flatness of the melt a circular sweep pattern at low frequency (~3-6 Hz) is recommended with a softly defocussed electron beam. A beam overlap in the center of the liner should be avoided (ring shaped pattern). Other sweep techniques depend on the available equipment.

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PRODUCTS

Product Code	Description	Purity*	Dimensions
1.00871	Substance H1 Tablets Patinal®	≥ 99.95 % (3N5)	about 6.5 g Ø 14 mm x h 9.5 mm

* The purity values are based on the specified trace metals.

Appearance	
1.00871	Dark grey tablets

SPECIFICATION

Cobalt (Co)	≤ 0.001 %
Copper (Cu)	≤ 0.001 %
Chromium	≤ 0.005 %
Iron (Fe)	≤ 0.005 %
Vanadium (V)	≤ 0.005 %

RoHS information

The RoHS compliance information is part of the Certificate of Analysis (CoA) for each batch of Patinal® material.

Sizes	
1.00871	h = 9.0 – 9.8 mm Ø = 13.6 – 14.4 mm

Application test

Each batch has to pass a specific application test assessing its evaporation behaviour.

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Quality assurance

Research, production and sales of our Patinal® evaporation materials take place under a certified DIN EN ISO 9001:2000 quality management system and DIN EN ISO 14001 environmental management system. The quality of the materials is assured by our manufacturing processes, in-process controls and quality tests. Each batch is released only after passing our chemical analysis and application tests designed to confirm the suitability of the material for the evaporation process.

Handling precautions

Product safety information required for safe use is not included in this document. Before handling, read product and safety sheets and container labels for safe use, physical and health hazard information. The material safety data sheet is available online at www.patinal.com, from your EMD representative or distributor, or by calling your global Merck KGaA, Darmstadt, Germany, contact.

Disclaimer

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