

## Cryolite Patinal®

### GENERAL INFORMATION

Cryolite ( $\text{Na}_3\text{AlF}_6$ ) forms highly transparent, but soft and slightly hygroscopic layers. Thanks to its extended range of transparency it can be used for coatings from the UV to the IR wavelength range.

### AREAS OF APPLICATION

- Multilayer coatings, e.g. interference filters with ZnS and Cryolite

### THIN FILM PROPERTIES

Range of transparency	200 nm – 14 $\mu\text{m}$
Refractive index at 500 nm	1.32 – 1.35
Thin film stress	Tensile

The resulting optical properties of the thin film are dependent on process conditions like deposition rate and substrate temperature.

### NOTES FOR EVAPORATION

Evaporator source	Resistance heater thermal evaporator
Boat	Molybdenum or tantalum indirectly heated alumina crucibles
Evaporation temperature	800 - 1200 °C
Deposition rate	0.8 – 2.0 nm/s
Substrate temperature	250 – 300 °C
QCR-settings	Density 2.90 g/cm <sup>3</sup> , z-ratio 1.0

Cryolite decomposes to  $\text{AlF}_3$  and NaF during evaporation. The composition of the deposited layer varies depending on evaporation temperature. It is of advantage to evaporate at a pressure of less than  $2 \times 10^{-5}$  mbar and to use a liquid nitrogen cooled baffle.



## PRODUCTS

Cryolite Patinal® is available as granules.

Product Code	Description	Purity*	Dimensions
1.06457	Cryolite Patinal®	≥ 99.95 % (3N5)	Granules, about 1-4 mm

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

### Appearance

1.06457	White granules
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## SPECIFICATION

Cobalt (Co)	≤ 0.001 %
Copper (Cu)	≤ 0.001 %
Chromium (Cr)	≤ 0.002 %
Iron (Fe)	≤ 0.005 %
Manganese (Mn)	≤ 0.001 %
Vanadium (V)	≤ 0.005 %
Oxygen (O)	≤ 0.060 %

### Sizes

1.06457	granules 1- 4 mm ≥ 80 %
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### Application test

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

### RoHS information

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



## Quality assurance

Research, production and sales of our Patinal® evaporation materials take place under a certified DIN EN ISO 9001 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](http://www.patinal.com), from your EMD representative or distributor, or by calling your global Merck KGaA, Darmstadt, Germany, contact.

## Disclaimer

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### EMD Electronics

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