

# MoNa 2,6 wt-% Sputtering Targets

PS – PRODUCTSPECIFICATION

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## Information about the content

|                          |             |                          |             |
|--------------------------|-------------|--------------------------|-------------|
| <b>Responsible area:</b> | Plansee SE  | <b>Prepared/Updated:</b> | See SAP-DMS |
|                          |             | <b>Released:</b>         | See SAP-DMS |
| <b>Valid from:</b>       | 16-Jun-2020 | <b>Controlled:</b>       | PSE-020     |

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*This specification covers MoNa 2,6 wt-% sputtering targets.*

## 1 Dimensions and tolerances

The MoNa sputtering targets are produced according to Plansee SE drawings with the dimensions, tolerances and surface finish specified in these construction drawings.

## 2 Physical and mechanical product properties

**Guaranteed Density:**  $\geq 90\%$  (theoretical density is 8,25 g/cm<sup>3</sup>)

### 2.1 Surface condition

**Appearance:** The targets will have no cracks or abrasions. As MoNa is a composite material which is sensitive to humidity and oxidation, a discoloration cannot be avoided.

### 3 Chemical composition

| Main and minor components                       | Plansee                             | EU-Directive                        |
|---|-------------------------------------|-------------------------------------|
|   | Min. content [%]                    | RoHS <sup>a)</sup>                  |
| <b>Mo</b>                                       | balance                             | -                                   |
| <b>Na</b>                                       | 2,6 ± 0,2 wt.%                      | -                                   |
| <b>Purity</b>                                   | Min. 99,97 % <sup>b)</sup>          | -                                   |
| Impurities                                      | Max. values<br>[µg/g] <sup>c)</sup> | Max. values<br>[µg/g] <sup>c)</sup> |
|   | Guaranteed                          |                                     |
| Al  | 30                                  | -                                   |
| Co  | 10                                  | -                                   |
| Cr  | 5                                   | -                                   |
| Fe  | 30                                  | -                                   |
| Mn  | 2                                   | -                                   |
| Ni  | 10                                  | -                                   |
| W   | 1000                                | -                                   |
| C   | 200                                 | -                                   |
| O   | 40000                               | -                                   |
| Cd  | 5                                   | 100                                 |
| Hg <sup>d)</sup>                                | 1                                   | 1000                                |
| Pb  | 5                                   | 1000                                |
| Cr (VI)   |                                     | 1000                                |
| Organic impurities (e.g. PBB, PBDE, PFOS, PFOA) | - <sup>**)</sup>                    | 1000                                |

a) EU-directives 2015/863/EU, 2011/65/EU and 2000/53/EC

b) Metallic purity without W

c) µg/g ≙ ppm (mass fraction)

d) Initial value / first up

<sup>\*\*)</sup> The presence of Cr (VI) and organic impurities can definitely be excluded because of the production process (heat treatment at temperatures above 1000 °C).

The chemical composition is continuously checked by means of random sampling. The sampling inspection plan, analysis and evaluation methods are determined in the internal instruction PSE-020-WI-003. The application of the measured values for the chemical analysis is defined in PSE-680-WI-001.

**Remarks:** The specified physical and chemical characteristics are disclosed not regarding measurement accuracy.

## 4 Packaging, labelling, storage and certification

### 4.1 Packaging, labelling and storage

*Standard individual packing:* The target is vacuum-sealed in an Al-coated foil or plastic foil with barrier layer and desiccant, which is put into a transportation box.

*Each package will be provided with a label with the following information:*

|   |            |
|---|------------|
| <b>producer's name:</b>                     | Plansee SE |
| <b>product description incl. dimension:</b> | W x L x H  |
| <b>drawing number:</b>                      |            |
| <b>order number:</b>                        |            |
| <b>machining batch no.:</b>                 |            |
| <b>weight:</b>                              | kg         |

**The targets must be kept in a dry place and protected from mechanical damage.** The shelf time for the vacuum-packed targets shall be 6 months from the shipping date under the following storage conditions <sup>a)</sup>. However, the customer is recommended to use the targets within 3 months. Immediately before installation a discoloration cannot be avoided.

a) **Storage conditions: temperature:  $22 \pm 4$  °C; relative humidity of the air:  $\leq 50$  %; atmospheric pressure: approx. 1000 mbar.**

#### 4.1.1 Handling Recommendation

According to Appendix 1.

### 4.2 Inspection documents

All targets manufactured by Plansee SE will be certified including the following information:

#### 4.2.1 Identification

The target batch number and target number are indicated.

#### 4.2.2 Chemical composition

Inspection certificate 3.1 according to EN 10204:2004 (chemical elements see section 3).

#### 4.2.3 Dimensions

Actual values of length [mm], width [mm] or diameter [mm] and thickness [mm] of the sputtering target.

#### 4.2.4 Weight

Actual measured value [kg].

## 5 Order instructions

Please quote following information when ordering:

- dimensions
- quality (the number of this specification **must** be mentioned)
- quantity (number of targets)
- *for special packing:* specification of packaging

For further information on our delivery possibilities, please consider our <http://www.plansee.com>

## 6 Referenced standards

The standards applied for the test methods are listed in the Plansee standard InfoBase and are made available upon request.

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### Changes to last version

| Replacement for | Changes to last version   |
|-----------------|---|
| PS-CFT-024      | <ul style="list-style-type: none"> <li>▪ new document numbering key</li> <li>▪ new document layout</li> <li>▪ section 3: adaption of chemical impurities (Al, C and O)</li> <li>▪ section 3: RoHS directive appellation updated</li> <li>▪ section 4.1: drawing number added</li> <li>▪ section 5: specification of in case of special packaging</li> </ul> |

## Appendix 1

### Handling Recommendations for MoNa Targets

**MoNa sputtering targets are a composite material made from Mo and Na<sub>2</sub>MoO<sub>4</sub> (sodium molybdate).**

**Na<sub>2</sub>MoO<sub>4</sub> is hygroscopic (sensitive to moisture), therefore MoNa targets should always be stored in dry conditions. Every contact with solvents or sweat should be avoided.**

Please follow the next steps:

- The target should be kept in as-packed conditions in a dry place and protected from moisture
- The target should be unpacked only immediately before installation into the PVD chamber
- The targets should be handled only with clean rubber/latex gloves (fabric/textile gloves do not provide sufficient protection from human sweat!)
- Any contact of the target material with aqueous media and organic solvents (e.g. ethanol, acetone, isopropanol etc.) have to be avoided!
- After usage, the target should be either kept in the PVD chamber under vacuum, or stored in the same conditions as delivered: vacuum packed with fresh drying agent (e.g. silica)
- Stronger discoloration can be removed using Scotch Bright (dry!)
- Compared to pure molybdenum, a longer pre-sputtering time is recommended for MoNa targets