

Information about the content

Scope:	Plansee SE	Prepared/Updated:	Resch Joachim
		Released:	Glatz Wolfgang
Valid from:	10-Jan-2019	Controlled:	PSE-020

This document is subject to electronic version control – confirm revision status before using.

This specification covers Mo-H4 ribbons for the lighting industry.

1 Dimensions and tolerances

Thickness [mm]	Tolerances [mm]
0,10 – 0,12	± 0,0075
> 0,12 – 0,15	± 0,01

Width [mm]	Tolerances [mm]
11,00 – 15,00	± 0,05

The curvature may not exceed 5 mm over a length of 1000 mm.



Details to our certificates
at www.plansee.com



2 Physical and mechanical product properties

Density: a)	≥ 10,2 g/cm ³		
Vickers Hardness: b)	240 – 270 HV1		
Tensile Test: c)	Tensile Strength	0,2 % Yield Strength	Elongation
	[MPa]	min. [MPa]	min. [%]
	750 – 950	600	10
Erichsen Cupping Test: d)	min. 3,5 mm		

a) The density cannot be determined with sufficient accuracy because of small material thickness. Due to the high degree of deformation during production, it is assumed that the theoretical density (above given value) is achieved.

b) The actual value quoted in certificates corresponds to the mean-value of a representative control sample.

c) Samples are taken parallel to the rolling direction.

d) Erichsen cupping test is carried out for thickness above 0,12 mm.

Remarks:

All Mo-H4 ribbons are delivered stress-relieved annealed.

2.1 Surface condition

Appearance:	The material will be of uniform quality, free from foreign matter, splits and fractures. Surface defects and geometric variations are assessed in the frame of visual inspection.
Surface Roughness:	Cold rolled, bright: $R_a \leq 0,15 \mu\text{m}$
Burr:	$\leq 10 \mu\text{m}$



Details to our certificates
at www.plansee.com



3 Chemical composition

Main and minor components	Plansee		Standard	EU-Directive
	Min. content [%]		ASTM B386 (361)	RoHS ^{a)}
Mo	99,97 % ^{b)}		balance	-
Impurities	Max. values [µg/g]		Max. values [µg/g]	Max. values [µg/g]
	Typical	Guaranteed		
Al	1	10	-	-
Cr	3	20	-	-
Cu	2	20	-	-
Fe	5	20	100	-
K	6	20	-	-
Ni	1	10	50	-
Si	2	20	100	-
W	169	300	-	-
C	13	30	100	-
H	-	10	-	-
N	5	10	20	-
O	6	40	70	-
Cd	1	5	-	100
Hg ^{c)}	-	1	-	1000
Pb	-	5	-	1000
Cr (VI)			-	1000
Organic impurities (e.g. PBB, PBDE, PFOS, PFOA)	- ^{**)}	- ^{**)}	-	1000

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

b) Metallic purity without W

c) Initial value

^{**)} The presence of Cr (VI) and organic impurities can definitely be excluded because of the production process (multiple heat treatments at temperatures above 1000 °C in H₂-atmosphere).

The chemical composition is 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.



Details to our certificates
at www.plansee.com



4 Packaging, labelling, storage and certification

4.1 Packaging, labelling and storage

Standard individual packing: coils with inner diameter of 260 mm, lined with drier agent (silica gel) in a polyethylene bag

Coil weight: 90 % per delivery > 1,5 kg; 10 % per delivery may be $\geq 0,8$ kg

End packing: drums

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

Producer's name:	Plansee
Plansee order number:	
Lot number:	
Material number:	
Material:	Mo
Dimension:	thickness, width
Quantity:	Total quantity in kg
Date:	

The material must be kept in a dry place and protected from mechanical damage. It is best to keep the material in the original packaging before use.

Special packing: (extra costs will be invoiced)

Special packing should be used if the material is stored under unusual conditions or aggressive atmosphere (e.g. sea air, ...).



Details to our certificates
at www.plansee.com



4.2 Inspection documents

Following inspection documents will be supplied upon customer request according to EN 10 204:

Test report 2.2

Plansee confirms with this test report that the delivered product meets the specification and gives details of the material properties according to ongoing production surveillance, not directly related to the particular production batch.

Inspection certificate 3.1 (extra costs will be invoiced)

An inspection officer from Plansee confirms with this inspection certificate that the delivered product meets the specification and gives test results related to the particular production batch.

5 Order instructions

Please quote following information when ordering:

- Product description
- Quality (the number of this specification must be mentioned)
- Thickness, width
- Quantity in kg
- Required certificate and content in case of a 3.1 inspection certificate
- *For special packing:* Specification of packaging

For further information on our delivery possibilities, please look into 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.

Changes to last version:

Replacement PSE-605-PS-010 Rev. 02

- Section 2: Hardness range 240-270 HV1



Details to our certificates
at www.plansee.com

