

# MY-ESS-Ribbon

## Information about the content

<b>Responsible area:</b>	Plansee SE	<b>Prepared/Updated:</b>	Diethard LANG
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		<b>Controlled:</b>	PSE-020

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*This specification defines a ribbon with tapered edges (by etching) made of yttrium-mixed oxide doped molybdenum. This ESS-ribbon (Elliptically Shaped for Sealing-in) is particularly suitable for production of gas-tight current leads of quartz lamps.*

## 1 Dimensions and tolerances

**Ribbon Length / Spool:** ≥ 50 m / Spool

**or**

**Ribbon Weight / Spool:** ≥ 50 g / Spool

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**Ribbon Thickness:** 0,015 – 0,029 mm + 0,002 / - 0,003 mm  
 0,030 – 0,042 mm + 0,003 / - 0,004 mm

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**Ribbon Width:** 1,50 – 2,90 mm ± 0,10 mm  
 3,00 – 4,90 mm ± 0,20 mm  
 5,00 – 9,90 mm ± 0,30 mm  
 10,0 – 20,0 mm ± 0,50 mm

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**Edge Angle α5:** <sup>a)</sup> < 13°

a) The edge angle of the ribbon is determined by measuring the cross sectional area between the edge tip and a line, perpendicular to the center line in a distance to the tip of 5 times the thickness of the ribbon, and calculating the angle (= α5) of a triangle with the same area and a height of 5 times the thickness. The measurement of the contour of the ribbon in the perpendicular plane is done by optical methods or with a micro cross section.

**Special dimensions can be produced acc. to an especially matched specification.**

## 2 Physical and mechanical product properties

**Density:** <sup>a)</sup>  $\geq 10,1 \text{ g/cm}^3$

Tensile Test: b)	Thickness [mm]	Tensile strength		Elongation
		[MPa]		[%]
		Min	Max	Min
	0,015 – 0,024	750	1000	1,0
	0,025 – 0,042	750	1000	2,0

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 is achieved.

b) Samples are taken parallel to the rolling direction

### 2.1 Surface condition

<b>Surface condition:</b>	The surface is dull and free of oxide layers and impurities that are visible to the naked eye. The final annealing is done in continuous furnaces under reducing hydrogen atmosphere.
<b>Appearance:</b>	The edges are free of defects such as kinks, splits, ripples, twists or burrs.
<b>Roughness:</b>	$R_a \geq 0,15 \mu\text{m}$ (see section 6)
<b>Sweep:</b>	The radius of a bow of 1 m of the ribbon, hanging loose, may not be less than 400 mm (measured in the direction of winding). The twist may not exceed $90^\circ$ on an examined length of 50 cm.
<b>Sagitta:</b>	Curvature of ribbon $\leq 2 \text{ mm}/200 \text{ mm}$
<b>Edge line:</b>	The fringing to the edge line may not exceed $40 \mu\text{m}$ to the midline (measured on a $500 \mu\text{m}$ ribbon part).

### 3 Chemical composition

Main and minor components	Plansee Content		EU-Directive
			RoHS <sup>a)</sup>
Mo	Balance		-
Y- mixed oxide	0,47 - 0,60 %		-
Impurities	Max. values [µg/g]		Max. values [µg/g]
	Typical	Guaranteed	
Al	1	10	-
Cr	3	20	-
Cu	2	20	-
Fe	5	20	-
K	4	20	-
Ni	1	10	-
Si	2	20	-
W	169	300	-
C	13	30	-
H	-	10	-
N	1	10	-
Cd	1	5	100
Hg <sup>b)</sup>	-	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) 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 H<sub>2</sub>-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.

## 4 Packaging, labelling, storage and certification

### 4.1 Packaging, labelling and storage

**Standard individual packing:** Ribbon is wound on clear spools with drying agent (silica gel) sealed in a polyethylene bag. The core dimension of the applied spools must be between the 1.1x to 1.8x of the nominal width.

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

<b>Producer's name:</b>	Plansee
<b>Plansee order number:</b>	
<b>Charge number</b>	
<b>Spool number:</b>	
<b>Material:</b>	MY-ESS-Band
<b>Dimension:</b>	Ribbon thickness × Ribbon width in mm
<b>Length:</b>	in m
<b>Net Ribbon weight:</b>	in g
<b>Tare weight of the spool:</b>	in g
<b>Date:</b>	

The material must be kept in a dry place and protected from mechanical damage. It is best to keep the sheets in their original packing until used.

The original packing will protect the MY-ESS-ribbon against oxidation for 6 months from the time of delivery under the following storage conditions <sup>a)</sup>.

a) Storage conditions: temperature:  $22 \pm 4$  °C; relative humidity of the air:  $\leq 80\%$ ; atmospheric pressure: 900 – 1050 mbar

**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, ...).

### 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

MY-ESS ribbons can be delivered with a **minimum quantity** of 50 m/spool or 50g/spool in the dimensions listed in section 1.

Please quote following information when ordering:

- Product description MY
- Quality (the number of this specification must be mentioned)
- Thickness and width
- *Winding* (clockwise or anticlockwise)
- Quantity in kg or m
- 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>

## MY-ESS-Ribbon

### 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 for	Changes to last version
01	▪ Section 2: New values for the Elongation added, depending on the thickness of the ribbon