

Nickel-Chromium (NiCr)

Sputtering Targets for Large Area Coating Applications

Materion is a leading supplier of sputtering targets for large area coatings. Achieving optimal results during the deposition process requires targets capable of consistently producing uniform thin films and quality materials that meet or exceed industry standards. Our high-purity Nickel-Chromium (NiCr) sputtering targets are specifically developed to produce low defect and high performance thin films.

Applications

NiCr layers are often used in low-e or solar control layer stacks. Their purpose is to mostly act as the oxidation barrier for the silver layer, but they can also be used as the absorbing layer in specific sun protection coatings.

Since NiCr layers are generally sputtered as extremely thin layers (2-5 nm), perfect thickness homogeneity is necessary. Thus, the target materials must also be of extremely high homogeneity.

Composition

The most popular composition for the application in low-e blocker layers is NiCr 80/20 wt%. Other compositions, including additional alloying components, are available upon request.

Production

Planar NiCr targets are usually produced by Vacuum Induction Melting (VIM) and casting, followed by a well-defined thermomechanical treatment to adjust a perfectly homogeneous microstructure. Single piece “jumbo” targets can be produced up to Cr contents of 40 wt%. Multi-piece target constructions (segment length ~ 1 m) of up to 50 wt% Cr are also possible.

At higher Cr content, or when more complex compositions are required, powder metallurgical production techniques may be necessary.

Geometries

NiCr targets are mostly used as single piece monolithic planar targets with lengths of up to 3.8 m. We produce NiCr targets for use in all commercially available sputter tools and can provide custom designed special geometries as well.

NiCr targets are usually clamped onto the cathode. Solder bonded targets are available upon request.

Purity

NiCr targets for large area coating are usually of 2N8 (99.8%) purity

Quality Assurance

Materion uses ISO 9001:2015 certified procedures to guarantee the highest and most consistent product reliability. We strive for continuous process improvements using statistical process control. In addition to detailed specifications and sophisticated analytical methods, our employees are dedicated to the highest quality standards.



Recycling

NiCr targets, particularly when clamped, can be recycled after consumption. Different recycling programs are available depending on individual logistical conditions. Discuss best choice with your Materion representative.

Benefits

- Target material of extremely high homogeneity
- Custom designed special geometries available
- Compositions and purity beyond the popular NiCr are available, including additional alloying components
- Single piece “jumbo” targets of up to 40 wt% Cr
- Multi-piece target constructions of up to 50 wt%
- NiCr targets can be recycled after consumption
- Company dedicated to Quality Assurance and ISO 9001:2015 certified procedures

Physical Data for NiCr 80/20 Wt%

Density	8.5 g/cm ³
Coefficient of Thermal Expansion	13.3 · 10 ⁻⁶ K ⁻¹
Elastic Modulus	197 KN/mm ²
Electrical Resistivity	112 μ Ω cm
Thermal Conductivity	15.1 W/(m · K)
Melting Range	ca. 1400-1420 °C

Material Characteristics for Standard Planar 2N8 NiCr 80/20 Targets

Nickel (Ni)	80+/-1 wt %
Chromium (Cr)	20+/- 1 wt %
Copper (Cu)	< 400 ppm
Cobalt (Co)	< 400 ppm
Iron (Fe)	< 750 ppm
Molybdenum (Mo)	< 200 ppm
Manganese (Mg)	< 200 ppm
Titanium (Ti)	< 200 ppm
Sum of all detected impurities	<2000 ppm

Contact Us - Albuquerque

5941 Midway Park Blvd., NE
Albuquerque, NM 87109
Phone: 505.343.9440

Contact Us - Alzenau, Germany

Borsigstrasse 10, 63755
Alzenau, Deutschland
Phone: +49 60.23.91.82.0

MATERION Global Headquarters

6070 Parkland Boulevard
Mayfield Heights, OH 44124 USA
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