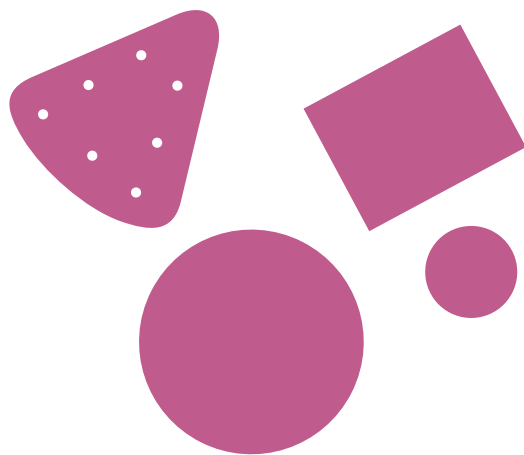




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MATERIALS SPUTTERING TARGETS

- Bonding of Sputtering Targets D 21

Bonding of Sputtering Targets

TARGET MOUNTING IN NEYCO'S LABORATORY

Neyco offers a complete target bonding service on new or existing backing plates:

- Debonding or debrazing of your target.
- Backing plate cleaning.
- New target bonding: Cu/elastomeric bonding (200°C) or silver based mounting (150° C).
- Cleaning and packaging of the assembly with UHV quality.



BONDING WITH Cu/ELASTOMER: A NEW PATENTED PROCESS

The mounting of your new target is made in our laboratory, using a specific elastomeric compound together with Copper metal. Ultimate temperature is up to 200°C with a vacuum compatibility in the range of 10^{-7} mbar.

Advantages:

- Low price.
- Very good thermal and electrical conductivities.
- Excellent adhesion between many metals.
- Suitable for low melting point target materials.
- Suitable especially for fragile targets.

COPPER PADS FOR SPUTTERING

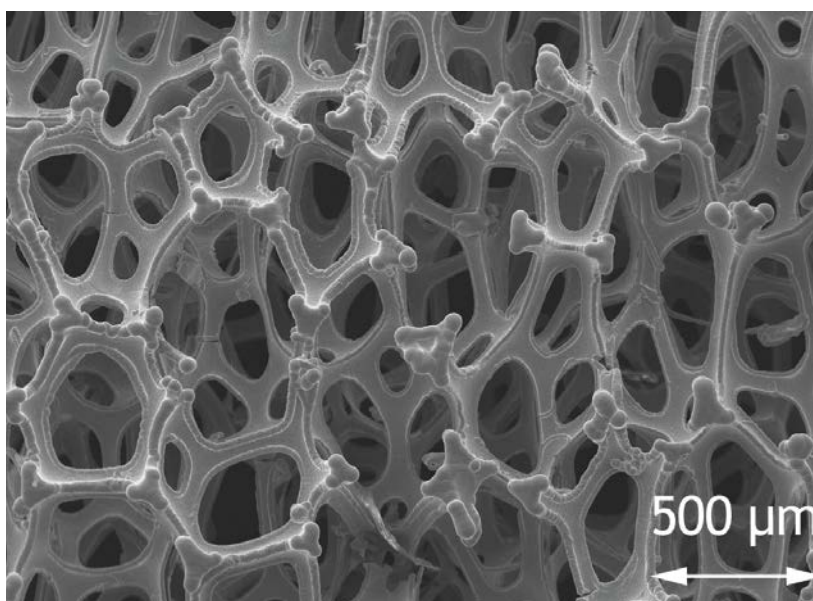
NEYCO has developed sputtering pads, as a replacement of Indium, Graphite foils or other bondings, for clamped targets.

TECHNICAL ADVANTAGES

- Cu metal properties for thermal transfer (from backing plate to target).
- Compensate the mechanical stress of targets.
- Electrical conductivity of Copper metal.
- Thickness of the pad after clamping 0.2 to 0.5 mm.

CHARACTERISTICS

- 100% metallic.
- Initial thickness 1.4 - 1.6 mm.
- Purity 99.95+%.
- Vacuum packed for a direct mounting in secondary vacuum.
- ~150 mm wide x length on request (up to 1000 mm).



Copper foam pad

SILVER-FILLED EPOXY BONDING CEMENT

CERAC silver-filled epoxy cement is a silver-colored thick paste containing the optimum ratio of silver powder to epoxy resin for maximum thermal and electrical conductivity and mechanical strength. The catalyst is a clear to yellow liquid. Both the epoxy cement and the catalyst should be stored in a refrigerator. This will give a shelf life of 6 months. Shelf life can be further extended to one year or more by freezing.

TYPICAL PROPERTIES OF EPOXY

Volume Resistivity	Less than 0.001 $\Omega \cdot \text{cm}$
Thermal Conductivity	0.02 cal.cm/sec.cm ² .°C
Pot Life (after catalyst addition)	30 min at 25°C (77°F)
Shelf Life (sealed container)	6 Months at 25°C (77°F) > 1 Year at 5°C
Use Temperature*	-50°C (-58°F) to 150°C (302°F)
Packaging	114 g

* Epoxy retains physical properties to 150°C (302°F), but some outgassing may occur above 115°C (239°F).

INSTRUCTIONS FOR USE

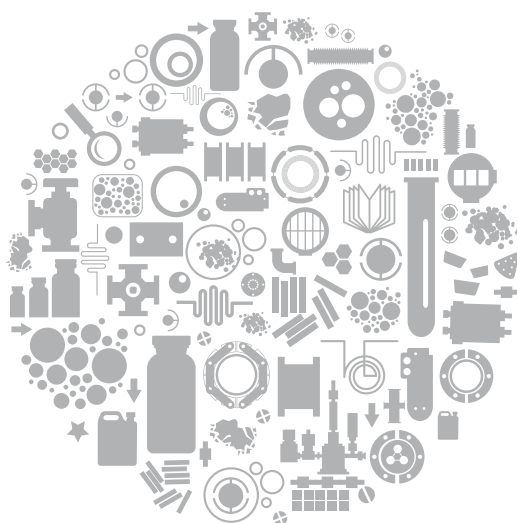
1. Degrease the backing plate, and roughen the bonding surface by lightly sand-blasting or sanding with #400 sandpaper. The bonding surface of the target should also be slightly abraded with #400 sandpaper or similar materials.
2. Mask the edges of both the target and the backing plate with cellophane or some other easily removable tape. Also mask the surfaces of the target and backing plate not being bonded to prevent contamination from the epoxy cement.
3. Epoxy cement and catalyst should be at room temperature (approx. 21°C or 70°F) for best results.
4. Add the required quantity of catalyst to the epoxy cement and thoroughly mix. Use a 2.7 weight % ratio (2.7 parts catalyst per 100 parts epoxy).
5. Spread the epoxy cement evenly and smoothly across the surface of the backing plate. Then, mound the epoxy cement towards the middle of the backing plate.
6. Position the target very carefully on the epoxied backing plate, and gently move the target back and forth slightly, while applying light pressure downward, until epoxy cement extrudes from ALL edges, and no gaps are noticed.
7. Remove excess epoxy cement with a small spatula, and be sure the target is parallel to the backing plate. Use a level table for curing. **Bond will form overnight at room temperature or for best results, heat to 65°C (150°F) for one hour.**
8. Remove all masking tape only when the bond is carefully cured.

HOW MUCH TO USE

For round targets, use the chart below. For other-shaped targets, calculate the surface area, and use amounts of epoxy and catalyst closest to a corresponding round target area.

The following table describes the maximum quantities of epoxy and catalyst you must use:

DIAMETER (Inches)	SURFACE AREA (Square Inches)	WT. OF EPOXY (g)	WT. OF CATALYST (g)
2	3.14	20	0.54
2.5	4.91	30	0.81
3	7.07	40	1.08
3.5	9.62	47.5	1.28
4	12.6	55	1.49
4.5	15.9	67.5	1.82
5	19.6	80	2.16
5.5	23.7	90	2.43
6	28.3	100	2.70
6.5	33.2	110	2.97
7	38.5	120	3.24
7.5	44.2	130	3.51
8	50.2	140	3.78
8.5	56.7	160	4.32
9	63.6	180	4.86
9.5	70.8	200	5.40
10	78.5	220	5.94
10.5	86.5	240	6.48
11	95	260	7.02
11.5	104	280	7.56
12	113	300	8.10



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