

Bonding of Sputter Targets on the Fullam EffaCoater and Fullam EMS-76 Sputter coaters

The Fullam brand sputter coaters models Effacoater and EMS-76 are using Indium bonded targets on a screw-in type target holder. The target holder is made of aluminum and contains 6 small button magnets. When the sputter target is spent (this is visible when the target material is sputtered away to reveal the target head material), you need to remove the target holder from the sputter coater and, remove the old target and bond the new target with Indium. Indium is used because it has a low melting point, bonds well to the head and the sputter target and fills uneven areas.

You need the materials/items listed below for the target bonding procedure. Make sure you have all the items at hand before you start the process. The procedure should be carried out in a fume hood with space available compatible to handle 170°C (340°F) hot items. For your convenience our product numbers with links to the product are provided.

Materials needed:

- 1 New Target with 2" or 50mm diameter (Au target #91520 or Au/Pd target #91522)
- 2 Indium bonding material; #29-49 (10gram)
- 3 Scotch-Brite™ cleaning material: #80926
- 4 Hot plate: #3233
- 5 Stainless steel tongs; #54479
- 6 Infrared Thermometer: #28167 or #28168
- 7 Tweezers: #5388-3NM
- 8 Heat resistant gloves; #12245
- 9 Two aluminum or brass discs with approx. dimensions of Ø64 x 12.7mm (Ø2-1/2" x 1/2")

Warning 1: Careful when handling hot items.

Warning 2: Do not overheat the target holder with the magnets. Overheating or prolonged heating will weaken the magnets inside the target holder resulting in decreased sputter efficiency.

Warning 3: Do not over-apply Indium.



Fig. 1 Heat to 170°C

Once you have set up all materials in the fume hood, the procedure has the following steps:

- 1 Remove target holder with old target from the sputter coater.
- 2 Remove the threaded stud from the back of the target holder and save to reinstall after bonding the target.
- 3 Heat the hot plate to 160°C (320°F). The melting point of Indium is 157°C (314°F).
- 4 Check the temperature with an infrared thermometer.

5 Place the target holder with the target facing up on the hot plate (use the tongs)

6 Wait until the target holder reaches 160°C to melt the indium which is between the target and the target holder. Use the infrared thermometer to check the temperature. If Indium is not melted, increase temperature a few degrees (Figure 1).

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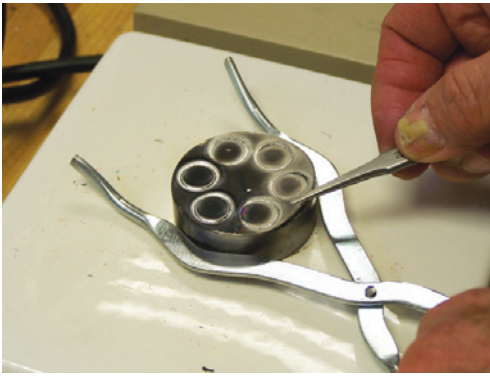


Fig. 2 Peel off old target

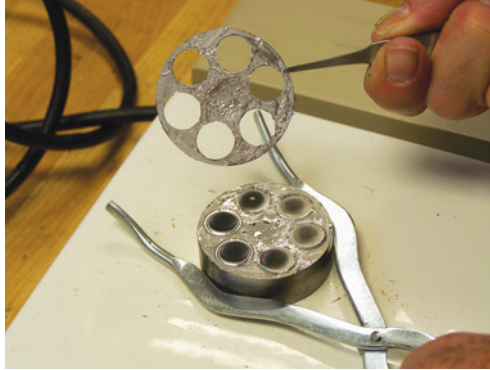


Fig. 3 Target removed



Fig. 4 Remove residue target material



Fig. 5 Smooth indium with Scotchbrite™

- 7 Remove the old target using tweezers; smaller pieces above the magnets are often left behind. Hold target holder with tongs (Figure 2 and 3).
- 8 Remove the smaller pieces of the target if needed. Part of the Indium is left on the target holder. Leave target holder on hot plate (Figure 4)
- 9 Place new target on the hot plate and allow to reach 160 – 165°C.
- 10 Smooth the remaining Indium with Scotch-Brite™ and add Indium to ensure sufficient bonding (Figure 5).
- 11 Transfer Indium to target using Scotch-Brite™ (Figure 6).
- 12 Bond new target to target holder by placing Indium covered side of the target on the Indium covered face of the target holder. Caution: make sure that Indium does not get on the other side of the target.
- 13 Move target holder with new target to aluminum or brass disc using steel tongs and use additional aluminum or brass disc to apply weight on top. The target holder and new target is now sandwiched between the two metal discs which act as a heat sink to solidify the Indium to create the bond between target and target holder (Figure 7).
- 14 Switch off hot plate.
- 15 Let target holder cool down.
- 16 When the target holder with the new target has cooled down, put back the threaded stud in the back of the target holder and install the target holder with the newly bonded target in the sputter coater – ready for use.
- 17 Discard safely of old target pieces (partly covered with Indium)



Fig. 6 Transfer indium to new target

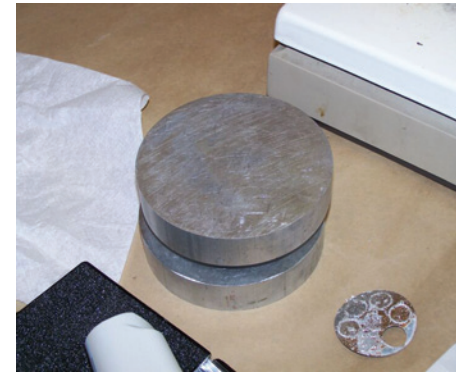


Fig. 7 Apply weight after bonding and cool

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