

# Procedure for the production of a 10 micron aluminum foil OTR window

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The basic principle is to use heat in order to stretch the aluminum window material and glue it to the frame while hot. As the window cools it will contract and stretch taut. Aluminum's coefficient of thermal expansion is  $23.5 \times 10^{-6} \text{ K}^{-1}$ . The expansion of a 1 cm disk of foil when heated from room temperature to 400 deg F is therefore 42  $\mu\text{m}$ .

Materials:

$10 \times 10^{-6}$  m Aluminum foil, about 1" square, provided by the Goodfellow Company

Permabond No. 922 metal adhesive with usable temperature range -80 – +500 deg F

1" square 1/16" thick piece of ground flat 410 stainless steel with a 1 cm hole for the OTR window

Second identical square of stainless steel without the hole

Procedure:

1. Clean all parts (except foil) ultrasonically with first soapy water and then alcohol.
2. Allow to dry completely.
3. Heat solid plate with the foil on top of it to 400 deg F with a hot plate.
4. Apply a thin ring of adhesive around the one 1cm hole in the other plate.
5. Press the plate with the adhesive onto the foil and apply brief pressure.
6. Leave assembly at 400 deg F for 10 min.
7. Turn off the heat source and allow the mounted foil to cool in place for about half an hour.
8. Trim off excess foil using a scalpel.