

Olympus Target - Damage from Heat

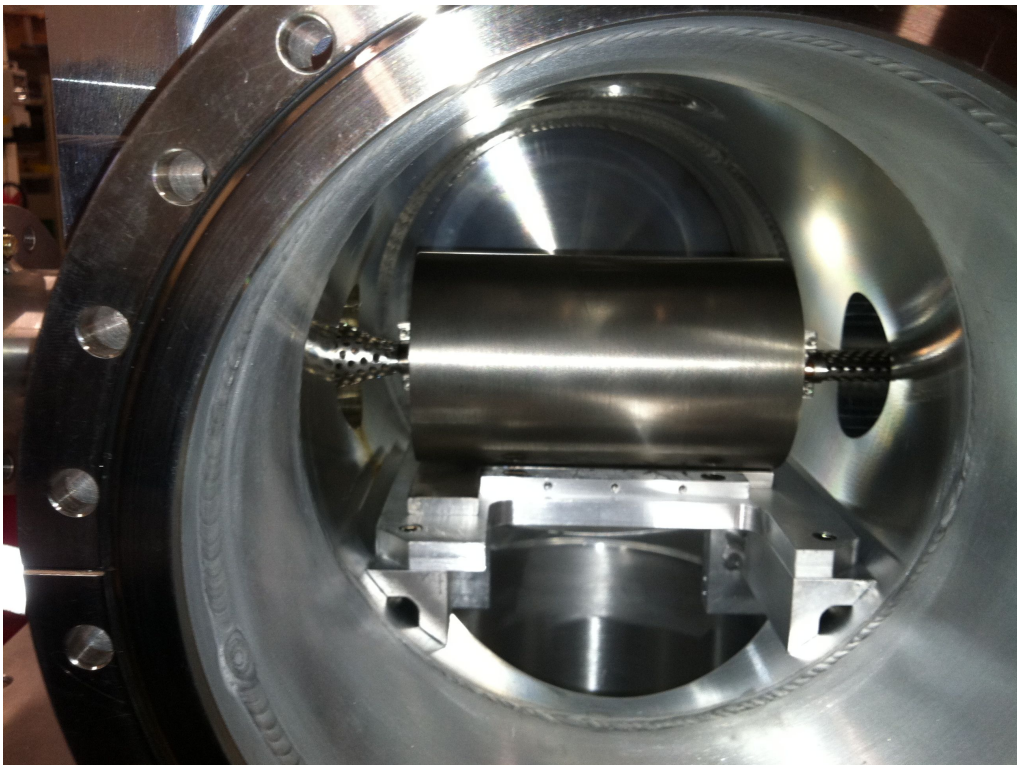
March 20, 2011

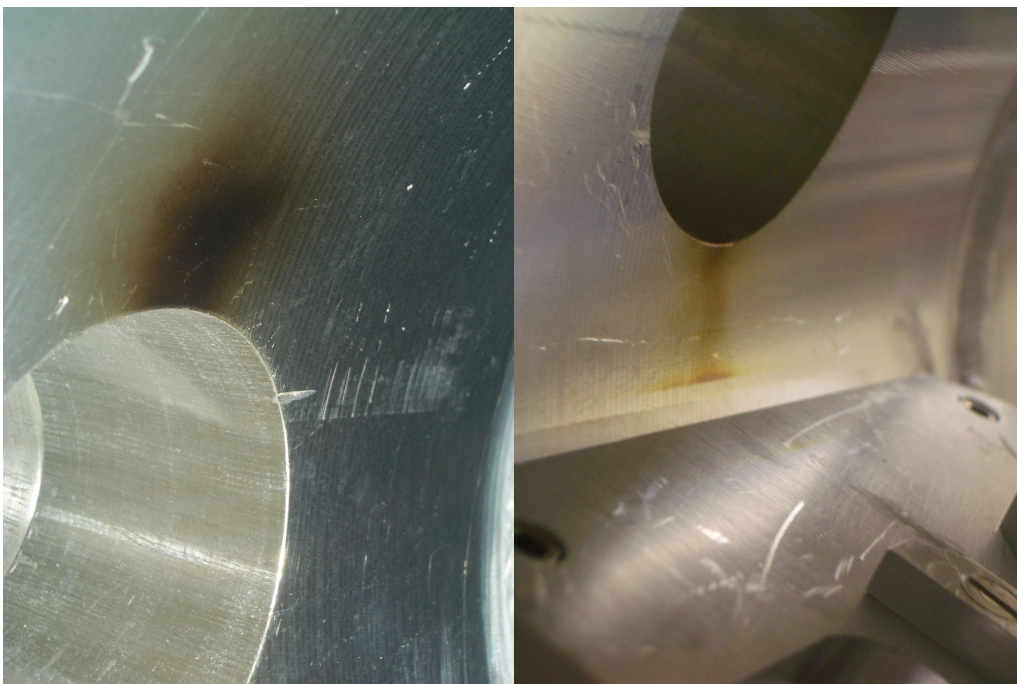
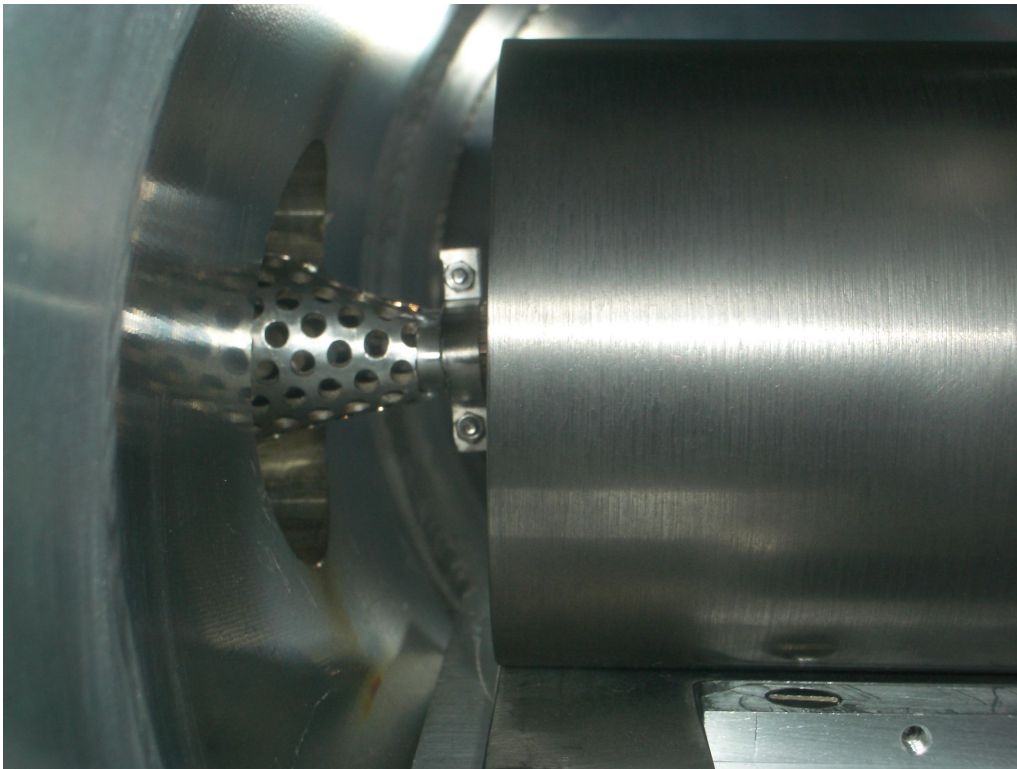
1 Foreword

The following document highlights some of the images we shot while opening the target chamber. All images are available at <http://hadronic.de/TheCell/> (user: cell, password: hot). The image numbers given in this document correspond to those on the web site.

2 Collimator

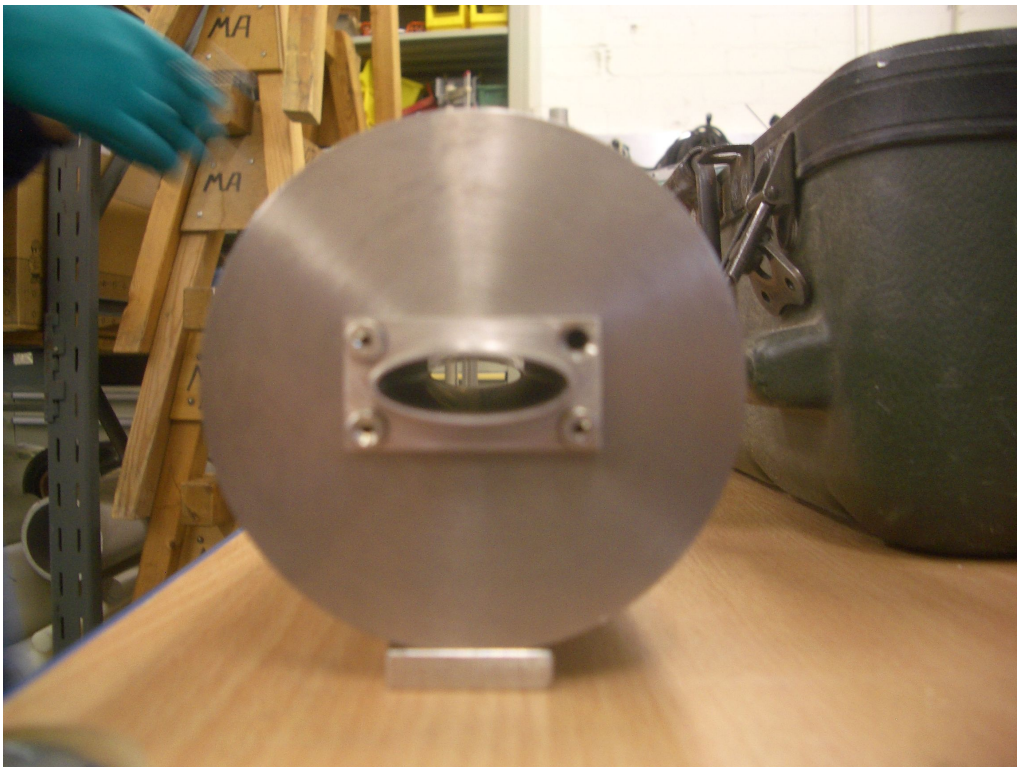
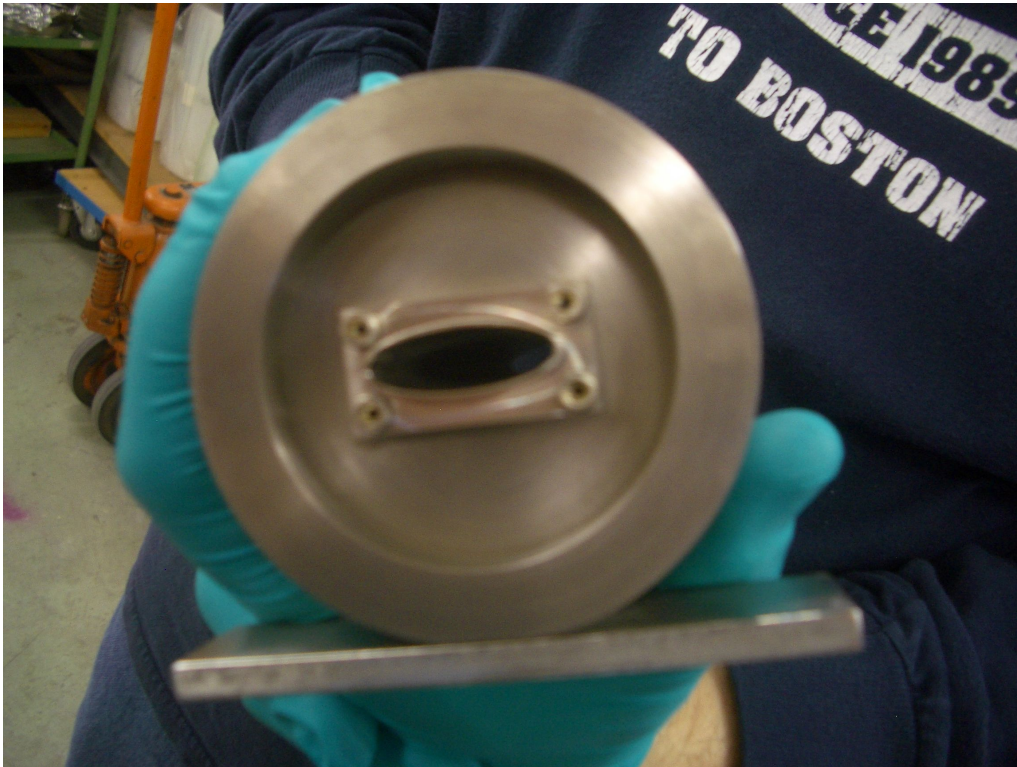
2.1 Images 23, 42, 79, 81





Strong discoloration above/below the upstream wakefield suppressor on the chamber wall upstream of the target in front of the collimator. The discoloration does not rub off. It continues slightly into the bore. Lower part shows a distinct line. This line may indicate a shadowing of the source by an edge, however, it is not clear which. The discoloration continues on the base of the collimator plate and stops where the plate was covered by the collimator assembly.

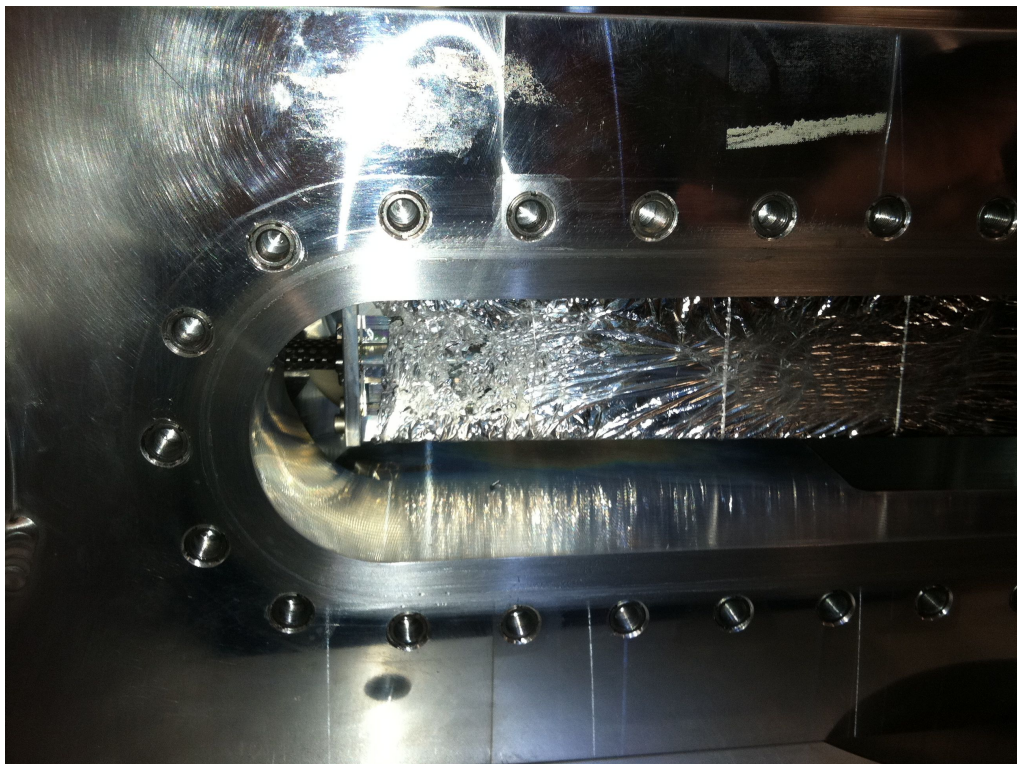
2.2 Images 71,72

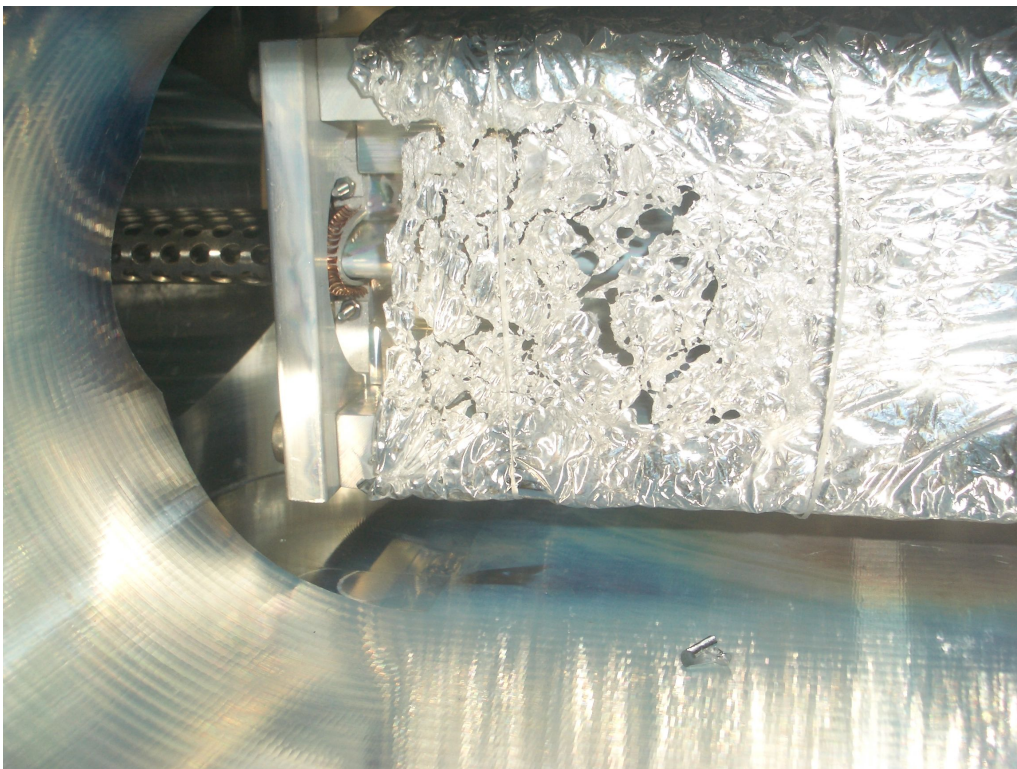
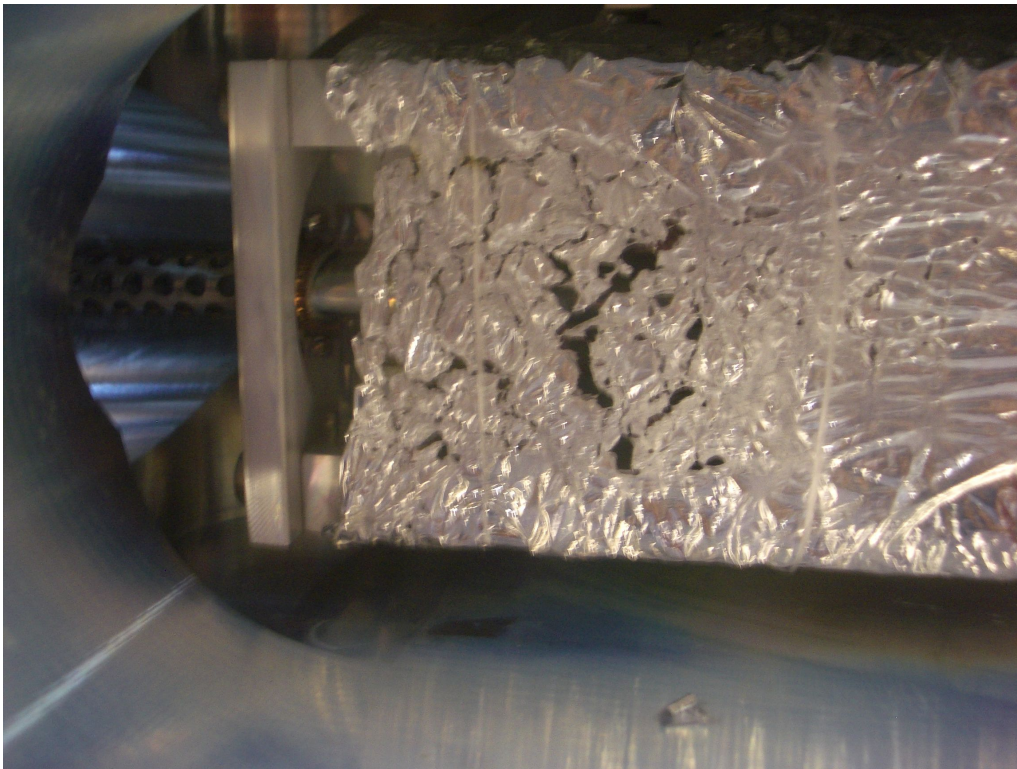


There is no damage visible on any side of the collimator

3 Superisolation

3.1 Images 27, 47, 51, 52



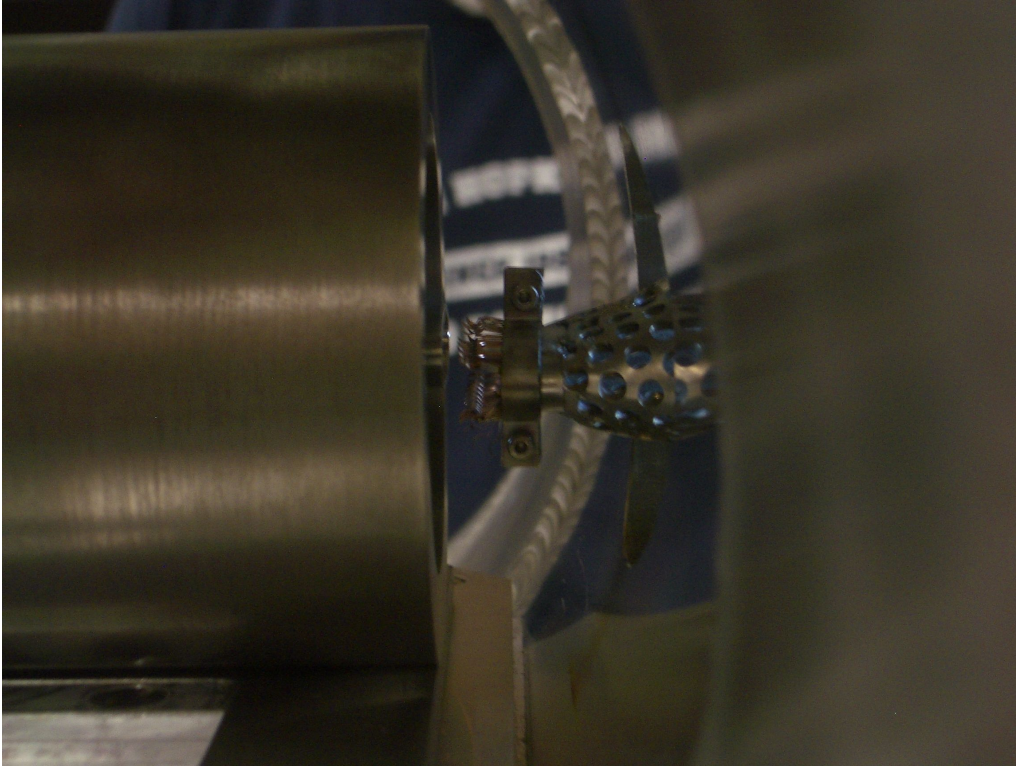


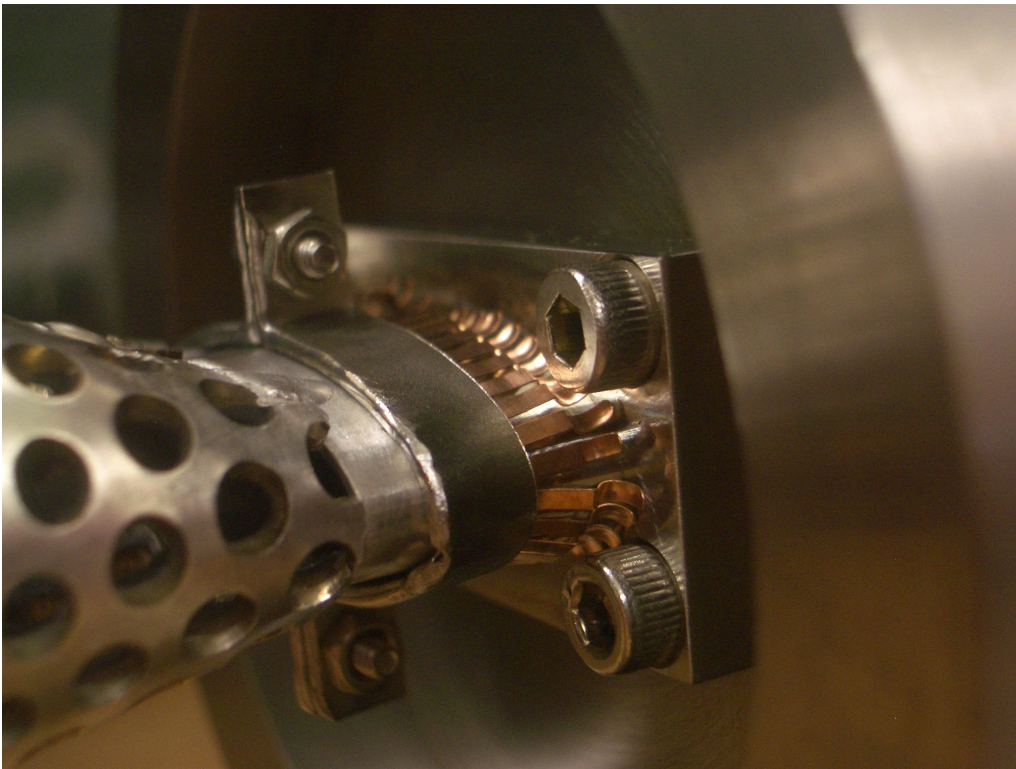
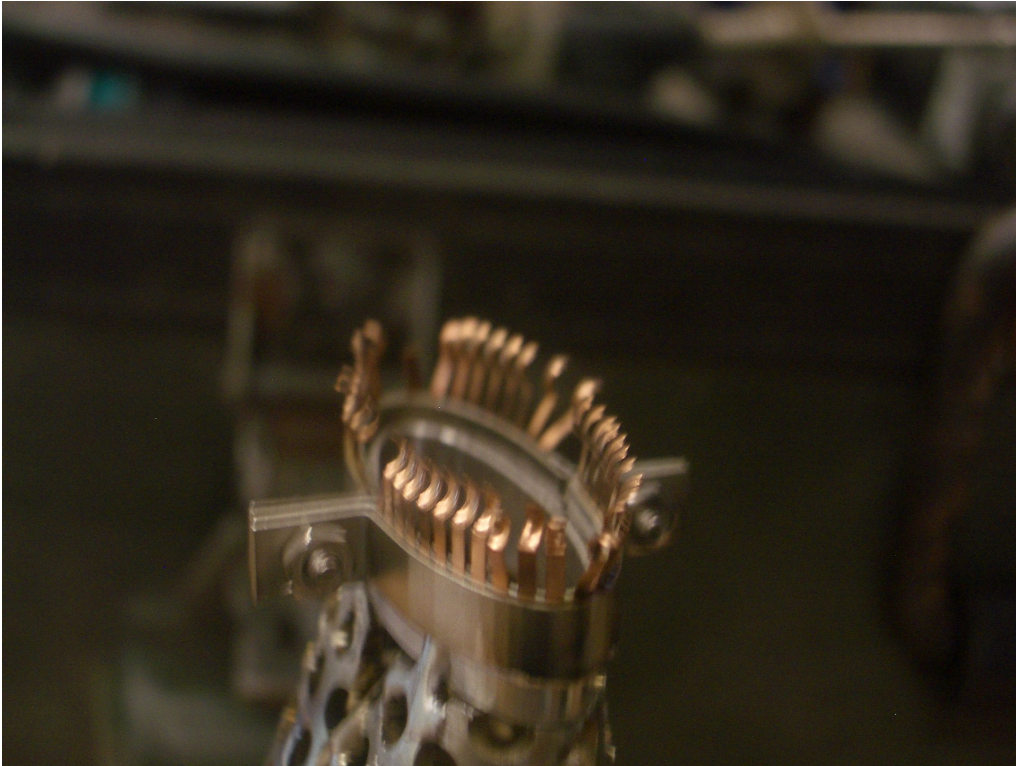
Superisolation was melted on both ends of the cell, on both sides. Damage is worse between aluminium struts, indicating that heat was not conducted through the struts. Also, damage seems to be symmetric in the up/down direction. Is the heat coming from the cell via radiation? I think that is unlikely, as the conductance of the cell wall to the aluminium should be better, and target sensors never showed so high temperatures.

One can see discoloration of the aluminum below the cell, maybe residue from the superisolation.

4 Wakefield suppressors

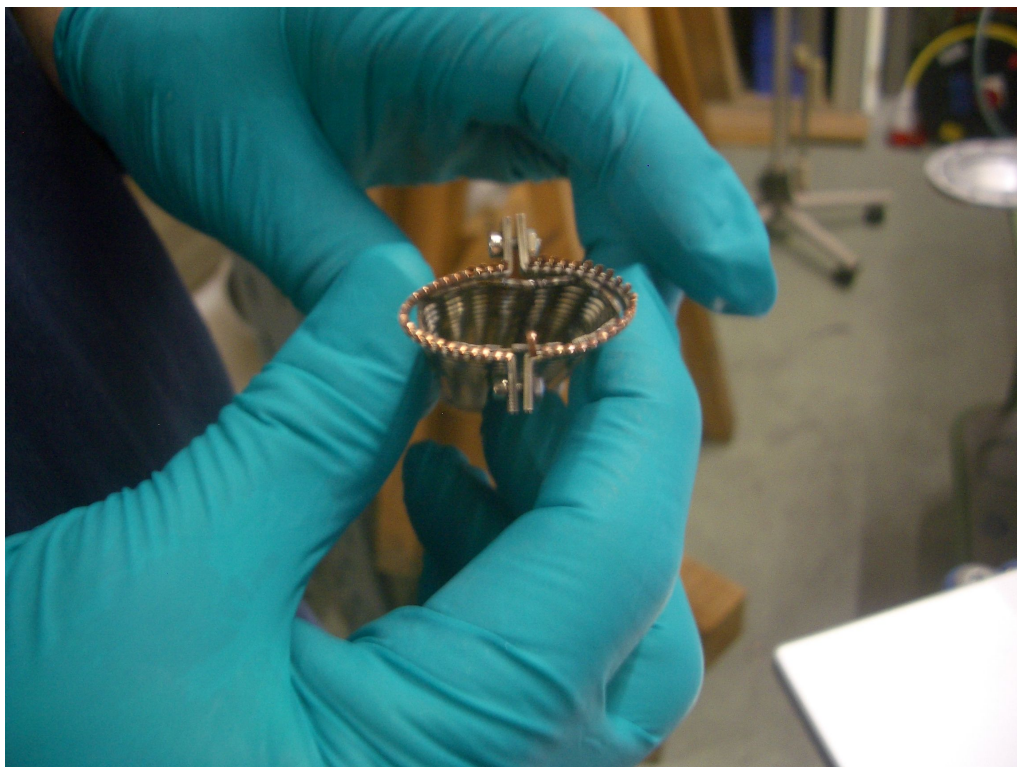
4.1 Upstream wakefield suppressor. Images 68, 76, 77, 83





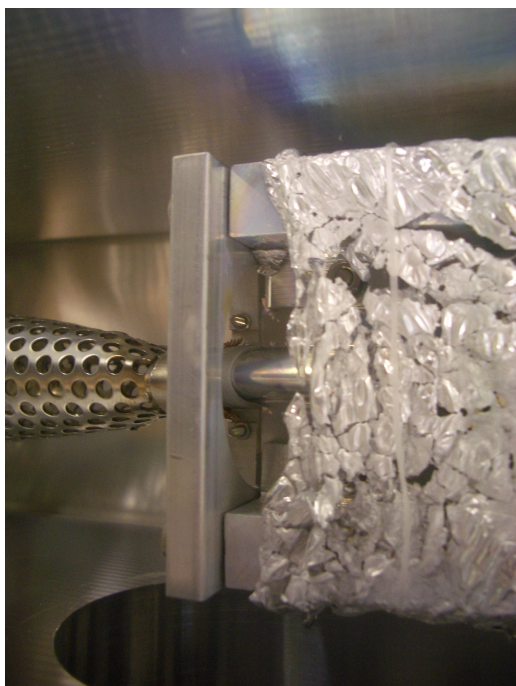
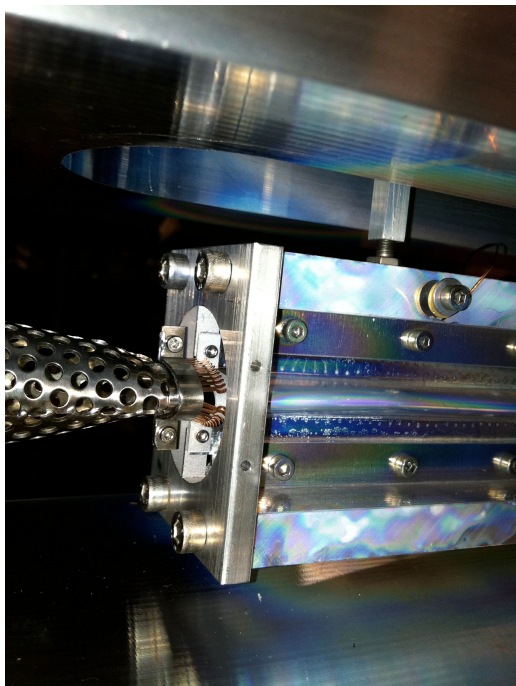
Fingers bend out of shape, outwards. Some people saw discoloration upward/downward inside the suppressor.

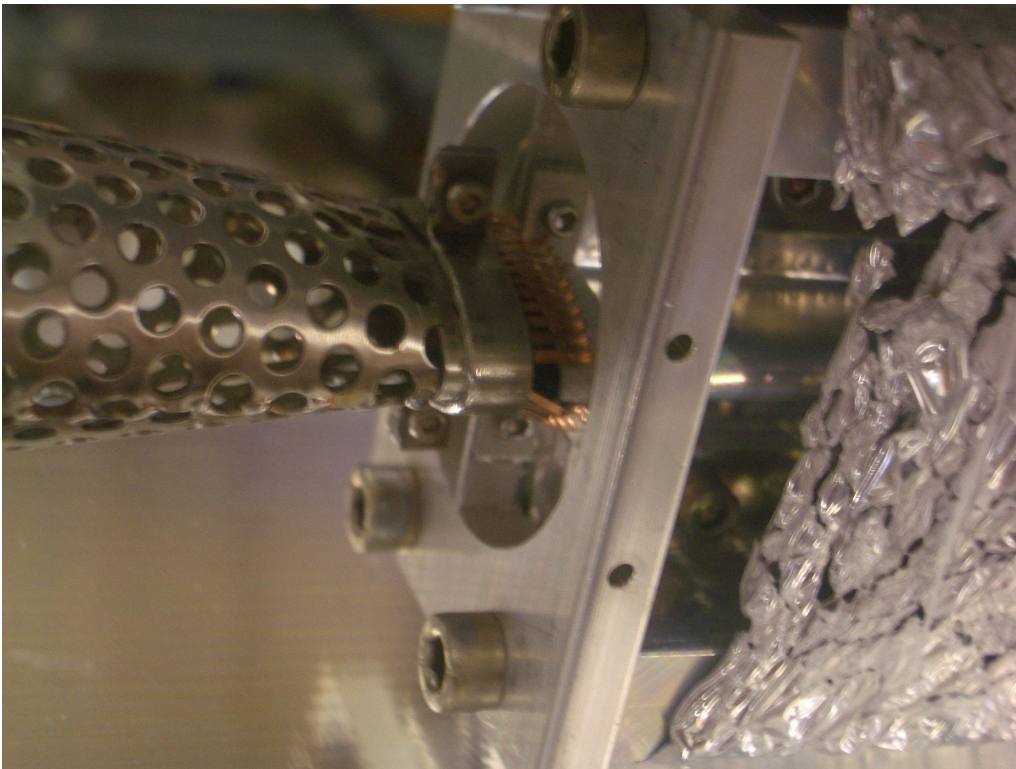
4.2 Connection Collimator to cell. Images 73, 74



Looked fairly good, but some fingers missing or completely bend.

4.3 Downstream wakefield suppressor. Images 31, 54, 56, 60



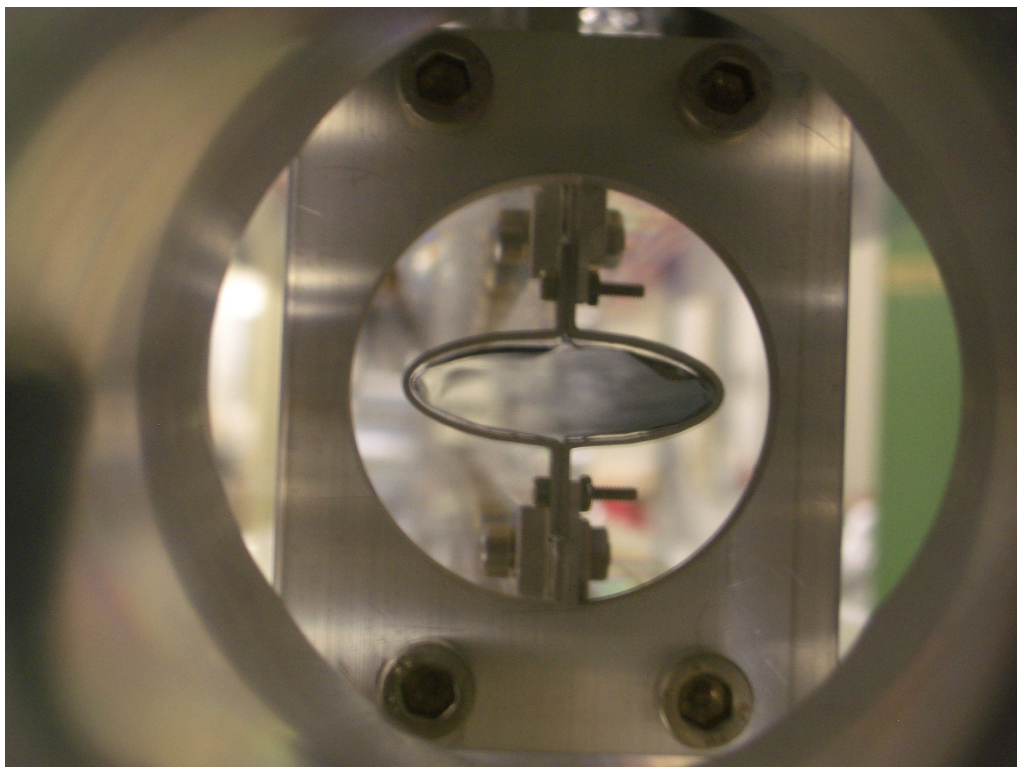


Fingers do not make contact in upper part of the cell.

5 Cell

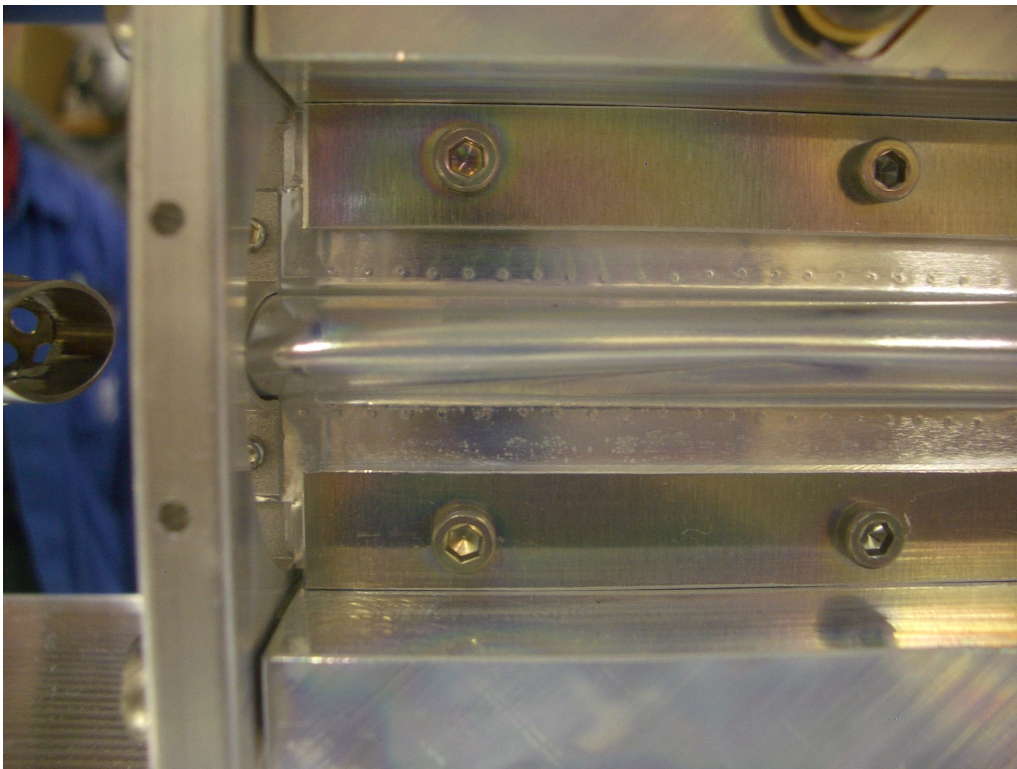
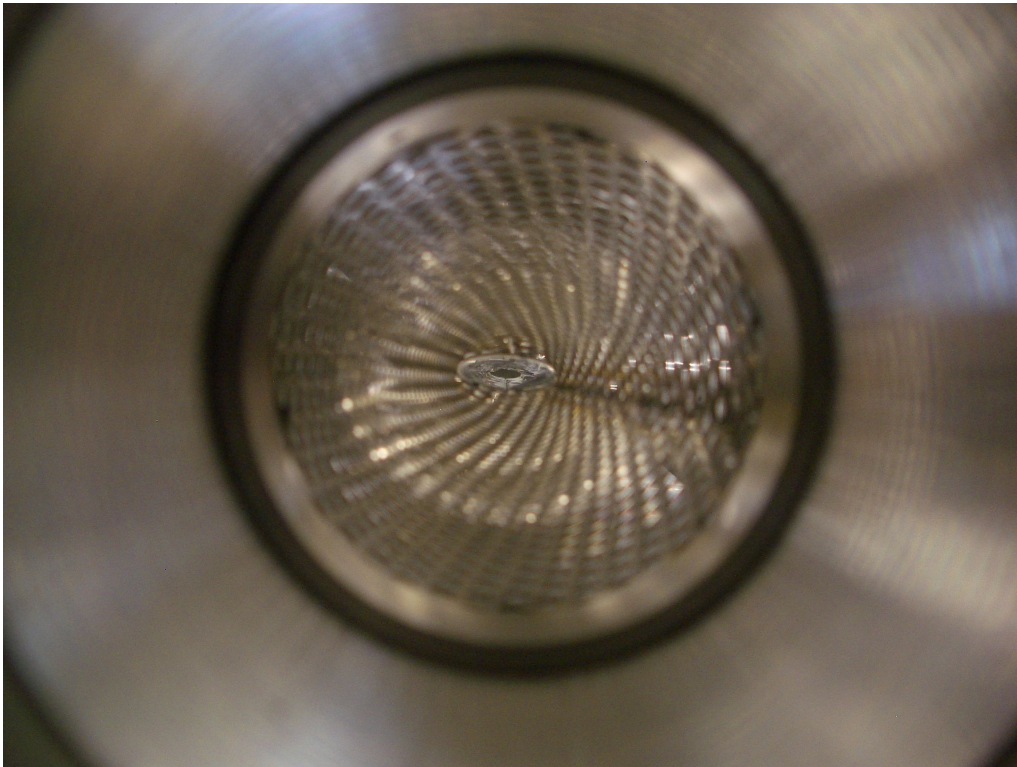
Over all, the cell itself looks fine, but has some discolorations near the ends, possibly from the superisolation. Both ends show damage.

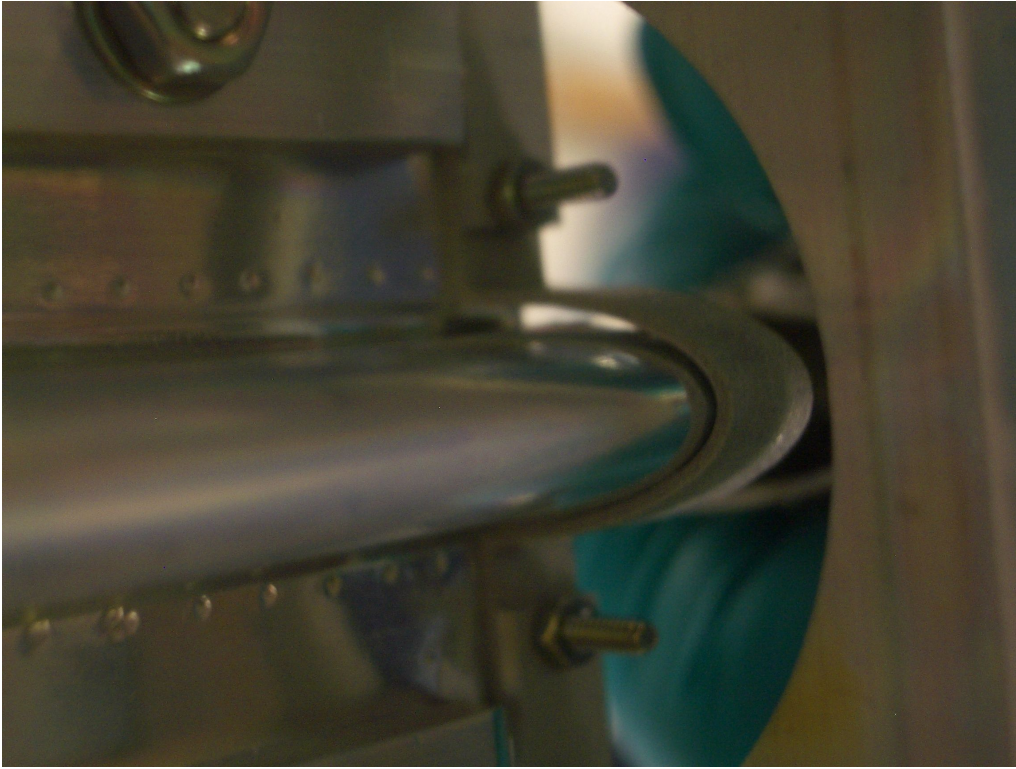
5.1 Upstream end. Images 16, 64



Cell wall not attached to the aluminium ring anymore.

5.2 Downstream end. Images 20, 21, 89





Cell foil also does not have contact with the ring. Also, cell has a dent, maybe caused by heat induced warping of the cell holding structure.