MACHINING OF PORAL® POROUS SINTERED METALS

The machining of PORAL® Sintered Metals must be made with caution to avoid affecting their porosity.

- Conventional machining leads to the closure of pores by strain hardening. Only the non-functional faces for filtration car be machined.
- Brushing must be also banned since it could also lead to a modification of filtration properties, even the closure of porosity.
- Holding parts during machining must also be made with caution because it can lead to deformations, changes in properties or even the degradation of the parts.
- Machining/cutting could lead to local oxidation if there is an overheating.

Several cutting techniques are available:

- ***Dry machining (even n/c lathe)***
  - Advantage: Cheap, good surface finish, dimensional accuracy
  - Disadvantage: Porosity closure by strain hardening. Tailored technical if the machined area does not correspond to a functional surface of the filter.
- ***Watter jet cutting***
  - Advantage: Less closure of the porosity compared to dry machining.
  - Disadvantage: significant pollution of the parts by the cutting solution often containing abrasive agents. This technique requires a complex cleaning (residual pollution possible anyway).
- ***Wire cutting by electroerosion***
  - Advantage: it largely preserves the porosity and could be adapted when the machined surface is a functional area for filtration. Possibility of machining complex shapes.
  - Disadvantage: Slight contamination by the dielectric bath. This technique requires also a cleaning step.
- ***Laser cutting***
  - Advantage : Fast, complex shape, sometimes cheaper
  - Disadvantage: Resultant burr requiring a deburring step (quite long), less dimensional accuracy compared to conventional machining.