

## CHEMICAL REACTOR DOMES

### TECHNICAL PROBLEMS

Reactor domes are subject to a variety of different constraints :

- corrosion from an aggressive industrial environment
- corrosion from the interior or exterior which can pierce the top and create (often serious) defects in the seal: in particular, for toxic gases released into the atmosphere or pressurised gas in the reactor.

Any seal applied (or reapplied) must therefore address a range of different problems: the seal, the corrosion resistance (to the environment and chemical resistance to the agents stored in the reactor) and it must provide an effective seal against pressurised gas.

### TRADITIONAL SOLUTION

Repairing a reactor using welded sheet metal, and a paint-based corrosion protection system.

- **the drawback** : it can be complicated to weld the metal if the gases in the reactor are explosive. This kind of operation would require the reactor to be completely drained of its gas, making it impossible to run an intervention on any equipment currently in use.

Casting reinforced concrete over the dome.

- **The drawback** : excessive loads applied to the roof of the reactor. The concrete can crack, creating further seal defects.

### SOUPLETHANE TECHNIQUE

The seal can often be restored on the equipment while it is still in use. It is applied cold, with no need for welds and no risk of explosion. SOUPLETHANE provides excellent adhesion to any type of substrate: steel, stainless steel, aluminium, galvanised steel, insulation, etc. SOUPLETHANE is applied as a continuous liquid film, without any joints. Any holes in the substrate which can lead to a seal failure are bridged using nylon fabric. This ensures that the support is continuous and unbroken, and it is on this substrate that the SOUPLETHANE is applied.

- **The benefits:**
    - SOUPLETHANE protects the substrate from an aggressive environment: acidic vapours, etc.
    - SOUPLETHANE allows to run interventions on equipment while it is still in service
    - SOUPLETHANE is resistant to UV light (no chalking)
    - It is resistant to most chemicals. However, it is important to check the constituents of the reactor (gases and liquids) to ensure that there can be no incompatibility.
- If there are incompatible substances, the holes in the top should be covered with welded sheet metal. This will prevent the SOUPLETHANE from coming into direct contact with the chemical agents in the reactor.
- It offers excellent adhesion to the substrate (20 MPa).



- It is extremely easy to clean and repair (cold, no need for solvents, applied directly onto itself).
- It can be applied directly onto a hot substrate (up to 160°C).

### SPECIFICATION

Sand-blast the substrate: if this is not possible (e.g. for safety reasons), then vigorously brush the support with a copper brush to avoid sparks.

In certain cases, the support can be scoured using pressurised water loaded with sand.

- Treat any irregularities (holes, cracks, etc.) by bridging them with a synthetic fabric glued with SOUPLETHANE. Apply the SOUPLETHANE manually with a roller, or using a twin-component airless pump
- Thickness: from 0.5 mm to 2 mm if necessary, according to the nature of the environment.

### WORK REFERENCES

- UV resistance: LCPC - SNCF certification
- Chemical resistance: SGN Laboratory Rhône Poulenc