



# Technical Paper

## Pumping of special liquids

### Session 13-2

## Development on magnetic driven pumps for toxic and critical fluids

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## Summary

Latest Refinery development requires more and more horizontal and / or vertical pumps with magnetic drive which have the advantage of being hermetically sealed to the outside. For extremely toxic fluid like Hydrofluoric Acid, new magnetic drives with double containment shells have been designed as a second safety for single stage overhang pumps, by allowing supplementary leakage detection between the two shells. The addition of a safety mechanical seal obtains a third level of safety.

Other pumps that are used for critical mediums like fluid gas are multistage vertical double-casing pumps.

These fluids i.e. butane, propane or ethylene, normally have low specific density and are being pumped with suction pressure that is near to the vapour pressure. In most cases the NPSH available is quite low. The installation of vertical multistage pumps solves these problems.

The low specific gravity of these mediums (low damping properties) can induce poor rotor dynamic behaviour in a pump with high number of stages. This problem can be addressed by using graphite intermediate bearings.

To prevent the need to use complex double mechanical seal and associated seal system, the vertical pumps are provided with magnetic coupling.

Our company developed the vertical pump range TTMCM which features a balance disc and counter disc and a permanent magnetic axial thrust bearing. In addition this pump can also be equipped with a double containment shell.