FLUITEN MECHANICAL SEAL FOR A VERTICAL REACTOR AT 500°C

Fluiten has recently contributed to the **development of an advanced vertical reactor** designed for use in a cutting-edge waste **recycling facility** currently operating in a European Union country. The project originated as a pilot plant and evolved into a **full-scale implementation**, developed in close collaboration with the equipment manufacturer a leading Italian company specialized in high-temperature process systems.

At the heart of the system is a vertical reactor that operates under extreme thermal and mechanical conditions. Fluiten was entrusted with the design and supply of the **mechanical sealing solution** positioned between the rotating shaft and the process vessel, as well as the complete auxiliary system for lubrication and cooling. The sealing system featuring a Mechanical Seal with a **diameter of over 200 mm** was designed to maintain reliable performance at a **process temperature exceeding 500°C**. Due to the chemical and physical characteristics of the application, special attention was required in the design of the sealing geometry to prevent any risk of solidification that could compromise the function of the system. This presented a significant engineering challenge.

One of the key aspects of the project was the **transfer of heat** from the reactor to the sealing area, which occurs through the rotating shaft and vessel. Fluiten engineers, working in close synergy with the reactor manufacturer, performed detailed **thermal simulations** to ensure accurate evaluation of thermal loads and optimal system design. The scope of supply included not only the **Mechanical Seal** but also the customized **flushing system**, which provides barrier liquid circulation to dissipate the heat transferred from the process and the heat generated by the seal itself. This solution ensures control of all critical parameters, essential for both process safety and long-term reliability.

Projects of this level of complexity demand the ability to deliver tailor-made solutions for mission-critical industrial applications a challenge that Fluiten has proven capable of overcoming with success.