

Success Story: Retrofit on Chemical Reactor for Agrochemical Production

The Challenge

The agricultural chemical sector requires reliable and high-performing plants for the production of herbicides, fungicides, insecticides, and biostimulants for crops such as cereals, maize, olive trees, apple trees, tomatoes, and soybeans. At a major **Italian chemical plant** specializing in this field, a critical issue arose with a **stainless steel reactor equipped with an agitator: the packing gland seal** used did not ensure adequate safety levels nor sufficient containment of emissions into the atmosphere. Following this analysis, it became clear that the sealing system needed to be modified to achieve zero process emissions into the atmosphere with a new solution aimed at reducing routine maintenance interventions and capable of lowering the mean time between repair (MTBR).

Main issues identified:

- **Poor operational safety, harmful emissions into the atmosphere**
- **Frequent inspections and maintenance on the packing seal**
- **Low reliability resulting in an unsatisfactory MTBR (Mean Time Between Repair)**

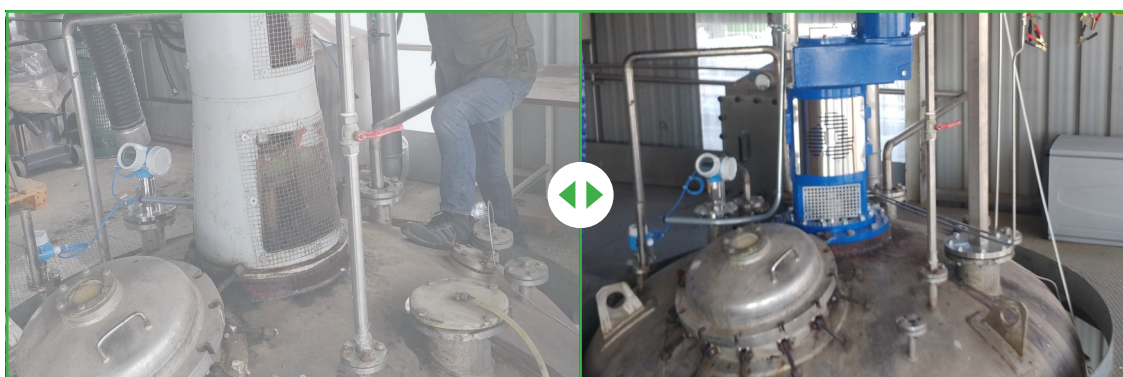
Project Goal

Ensure greater reliability and improve production performance through:

- Elimination of the packing gland, inadequate for emission containment
- Implementation of a modern technical solution compliant with safety standards
- Optimization of the production process
- Reduction of energy consumption and maintenance costs

Technical Analysis

Discussions with the plant technicians highlighted that the top priority was to increase safety by containing emissions into the atmosphere, given the toxicity of the process. Secondly, they aimed to reduce **machine downtime**.

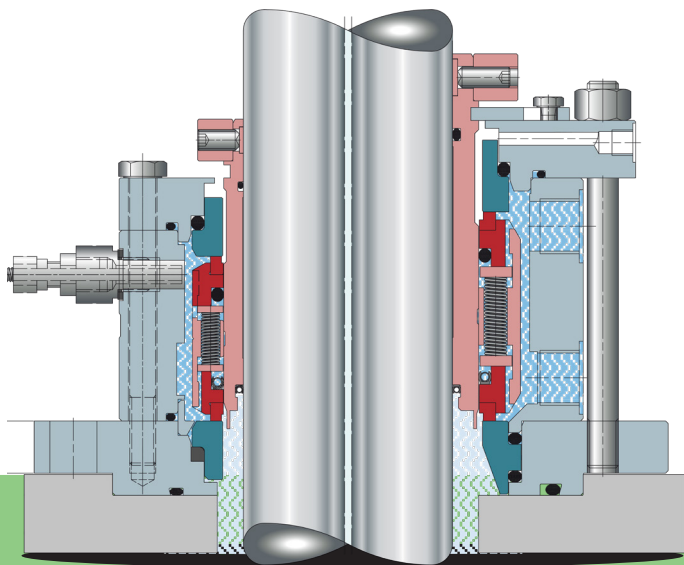


BEFORE

AFTER

Evaluation of Alternatives

Fluiten's technical team carried out an inspection of the machine (agitator, lantern, and shaft line) and concluded that a revamping intervention would not have been economically viable. Considering the **performance improvement** objective, it was decided to **completely replace the shaft line** to allow the installation of a double mechanical seal.



Adopted Technical Solution

Fluiten proposed the **GT1811A double mechanical seal**, ensuring safety, emission containment, and process compatibility. The cartridge-mounted seal fits the existing machine, with standardized dimensions and suitable construction materials. An auxiliary pressurization system with a 12-liter barrier fluid tank (**pressurized 1 bar above process pressure**) provides lubrication, cooling, and emission control, with alarms for minimum pressure and fluid levels. A dedicated pump circulates fluid to remove heat from the seal and process. The system is designed for maximum reliability, low maintenance, and improved process efficiency.



Execution of the Intervention

Timeline: **approximately 8–9 weeks** for supply and installation completion

RESULTS

Technical Improvements

- Zero process emissions into the atmosphere guaranteed.
- **Elimination of packing gland and reduction of periodic inspection and maintenance activities.**
- Drastic reduction in maintenance costs.

ECONOMIC BENEFITS

- Significant reduction in average batch production times: estimated improvement of **35–40%**.
- **Decreased energy consumption:** the mechanical seal provided by **Fluiten consumes 80% less compared to a packing system.**
- Increased **plant productivity** with the same operational time.



Why Choose Fluiten

Through a targeted approach and strong partnerships, Fluiten delivered a **customized solution** for a complex chemical plant, enhancing safety, **efficiency**, and **economic performance**, and strengthening its role as a **strategic partner in the chemical sector**.