



**Case story #9**

<b>INDUSTRY</b>	AGROCHEMICAL PESTICIDE
<b>MEDIA – COND</b>	HCl, chlorine, phenol, 120°C
<b>MATERIALS</b>	GT FLON
<b>EQUIPMENT</b>	SHELL & BLOCKS REACTOR / HEAT EXCHANGER
<b>YEAR</b>	2016

A Chinese state owned company is manufacturing pesticide with a process using chlorine gas, phenol and hydrochloric acid at 120°C.

This customer adopted earlier GT-FLON grade for a condenser which gave fully satisfaction to customer (see case story #6). Customer solved this way his recurrent corrosion problem. They previously used phenolic impregnation grade which lifetime was around 3 to 6 months.

Knowing that GT-FLON is able to withstand their operating conditions and that graphite can adopt complex shape by simple machining in plain graphite material, , they proposed GT to design an equipment which could simultaneously reacts the liquid and gas phase and control the temperature efficiently during the reaction .

The chemical reaction of chlorine gas, phenol , hydrogen chloride and other intermediates is very exothermic. Previously their process requested several chemical reactions in a series of reactors and heat exchangers.. The exothermicity of the reaction did not allow customer to make big size batch as the temperature control is critical to control the chemical reaction. The challenge is to replace several reaction steps within one equipment.

GT designed a special mixer using the principle of falling film but with the particularity to avoid contact of liquid phase and gas phase before the cooling area to avoid unwanted chemical reactions. As this equipment is in development stage, the reactor compartment was designed to easily dismantle it and adopt new design of falling film if needed for process optimization.

The equipment adopted 6 blocks diameter 350mm for a total length of 3.2m and a heat exchange area of 16m<sup>2</sup>.

Equipment was manufactured using GT-FLON grade which has outstanding corrosion resistance, much better than traditional phenolic resin impregnation. GT-FLON is perfect choice when strong oxidizing agent is in the process.

The other alternative would be to choose high nickel alloy material but with a higher cost.

GT-FLON is most of the time very competitive against high cost metallic equipment and can have lifetime up to 20 to 30 years.

Allow customers to confidently and smoothly operate media in harshest conditions of corrosion, fouling, temperature and pressure.

Allow customers to push forward the efficiency and cost effectiveness of their chemical processes.



Graphite Technology manufactures a wide range of equipment with a wide range of graphite materials for all chemical processes industries.

Heat exchangers, column, reactors, piping & fittings, fuel cells,...adapted to pressure, highest corrosion and wide temperature range up to 1500°C (2730°F).

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