Case story #1

INDUSTRY	AGROCHEMICAL - PESTICIDE
MEDIA – COND	SULFURIC ACID 60% - 160°C
MATERIAL	G FLON
EQUIPMENT	SHELL & BLOCKS BOILER & HEATERS
YEAR	2014

An agrochemical company in Shandong province, Weifang area, wanted to produce a pesticide with higher value on the market. This new project needed to set up a complete new chemical process.

This new process has several advantages. It will not produce as much waste acid as their traditional process which required a system for purification and recycling of reactants. The traditional process for treatments of the sub-products induced high costs (higher quantity of reactants and a lot of energy). The problem was that this new process request use of high concentration sulfuric acid at 160°C mix with mediums non compatible with graphite with phenolic resin impregnation (media 60% sulfuric acid + 2% phenol). The customer has long experience of graphite chemical equipment from local Chinese suppliers. They used phenolic impregnated graphite in several of their processes. This time, graphite equipment impregnated with phenolic is not able to resist corrosion for such process.

The main equipment of this project is a boiler connected to a glass lined reactor. The boiler needs to provide quickly the energy to bring the chemical mixture up to 160°C to allow evaporation and concentration of the reactor mixture. Steam at 175°C is available on site.

As graphite seemed to not be acceptable, customer studied possibility to use Tantalum heat exchanger at high capital cost.

Customer visited the CIFFE exhibition in Shanghai and discovered GT's offer with GT FLON grade (graphite impregnated with pure PTFE).

Customer provided the requirement for the 3 equipment. GT proposed a forced circulation boiler of 50m^2 HTA for the reactor. Heating power of 1300 KW at 50m^3/h process flow. Additionally GT sized 2 steam heaters (5m^2 HTA for 325KW at 2m^3/h and 2m^2 HTA for 140KW at 1.5m3/h) . All the equipment manufactured with PTFE impregnated graphite, grade GT FLON.

GT proposed also special customized design (STRESS FREE design) with material for corrosion protection at inlet and outlet of process media for each equipment. GT choose a combination of PFA and glass lined flange, based on the temperature at each nozzle.

Customer requested a delivery time of 2 months for the 3 sets equipment which finally were delivered in 9 weeks.

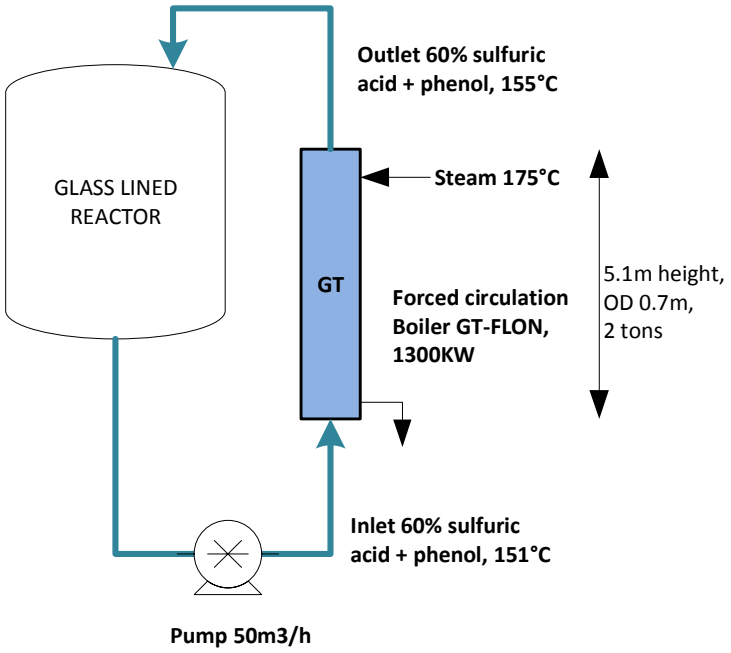
After installation of the equipment, GT went on site to check if the surrounding equipment like expansion below, condensate lines, pumps were correctly installed and did not bring additional stress or vibration to the heat exchangers to guarantee long life time.

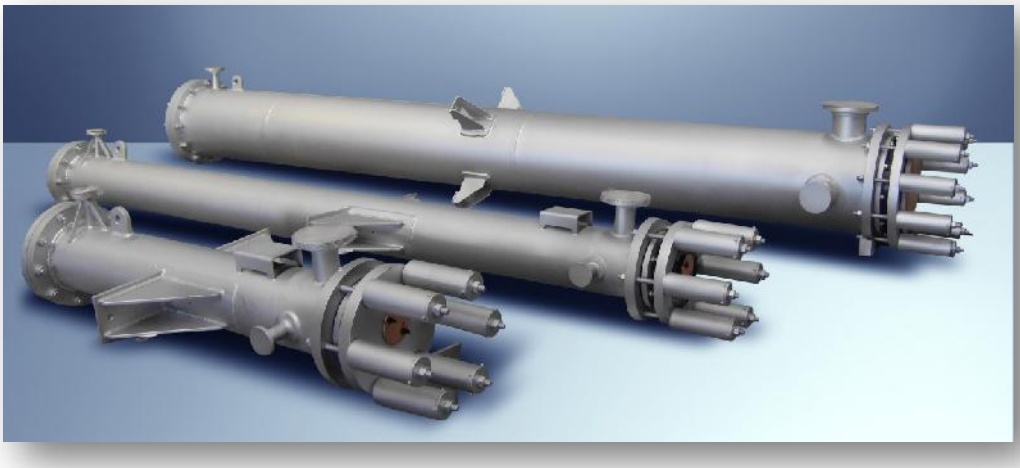
After start-up, the smallest equipment did not achieve the duty defined originally. After investigation, it was quickly identified that the flow on process side was 50% of the flow used for thermal calculation. By increasing this flow to match specifications, customer achieved the calculated duty.

Customer is fully satisfied by GT's supply and ordered new equipment in 2017 for a new project. Again GT-FLON was preferred against SiC shell and tube equipment.

Customer saved an important capital cost by choosing heat exchanger in GT FLON material instead of Tantalum (around 50% of the cost) or SiC material.

Sketch principle of main boiler installation





The 3 steam heaters in GT-FLON grade

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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