

Chemically Inert Coated Stainless Steel Reactor

July 2011 - Vapourtec announce a new “coated steel” reactor, offering the strength and conductivity of stainless steel but the chemical resistance of PTFE.

Background

Tube reactors in PTFE or PFA offer several advantages:

- a degree of transparency
- almost universal chemical resistance
- simple coil manufacture

However, there are some drawbacks.

- there are pressure limitations, especially at elevated temperatures
- for larger bore (higher volume) reactors, the pressure limitations force the use of thicker walls with a detrimental effect on heat transfer



For this reason, stainless steel tube reactors are normally used when higher pressures or temperatures are required. But stainless steel reactors have their own drawbacks.

- they are not resistant to strong acids
- there are some reactions which will not proceed as required in the presence of anything metallic

There are measures which can be taken (such as the use of Hastelloy® or certain surface treatments), but they are expensive and with strong acids these both slow rather than actually prevent corrosive attack.

A Different Approach

The new Vapourtec coated reactor consists of a thin walled stainless steel tube with a thick coating of PTFE (~100 microns) on the bore. This permits pressures that PTFE or PFA tubes could not withstand, but with total chemical resistance.

It also permits higher temperatures than standard PTFE tubes because the PTFE coating plays no structural part in the pressure containment.



The new coated reactor coils are compatible with all existing Vapourtec R Series (and standalone R4) systems.

And they can be used with the FlowCommander reaction automation software without any software upgrade required.

FAQ

Q What size reactors are available

A Currently there is one size, 18ml. More may become available as requested.

Q What is the maximum temperature that the reactor can be operated at

A It is currently rated at 150°C, though test work is ongoing and it is expected that higher temperatures will be announced shortly.

Q What is the maximum pressure that the reactor can be operated at ?

A The reactor can be operated at up to 50 bar at up to 150°C.