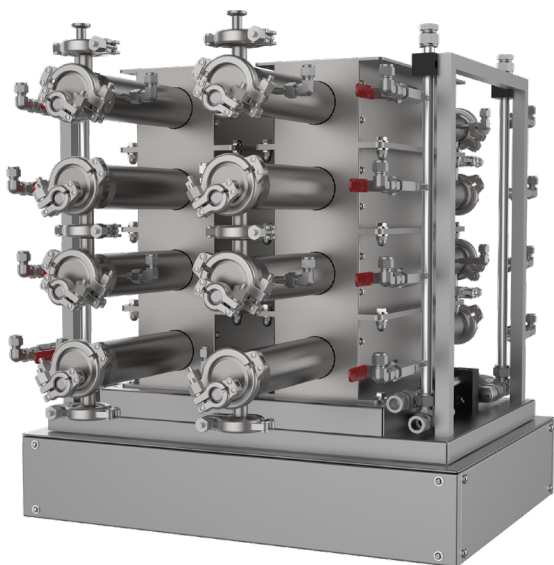


# Coflore® ATR - Agitated Tube Reactor

## Pilot Scale Flow Reactor



The Coflore® Agitated Tube Reactors (ATR) are the most flexible and capable plug flow reactors available. Their unique characteristics stem from the use of radial active mixing using freely moving agitators within each reactor tube, rather than passive mixing. This approach decouples plug flow and mixing from residence time (or flow rate) to give very low dispersion numbers, fast blending and uniform shear. Simple tubular design and low pressure drop facilitates the processing of slurries and gases without the risk of settling or poor dispersion. Coflore® active mixing ensures excellent mass transfer between multiple phases (liquid-liquid, liquid-solid, liquid-gas, liquid-solid-gas). This design also eliminates the need for mechanical seals, rotating drive shafts and baffles.

The ATR agitating platform is mounted on an anti vibration table. The ATR is available with either **Analogue** or **Digital Control (Available in ATEX or Non-ATEX)**

### Coflore® ATR

**4" OD Fume Extract Connection** for connecting the ATR cabinet to local exhaust

**Removable Access Panels** with viewing window and 1/4-turn panel key locks. Removable to provide full access to the reactor tube assembly

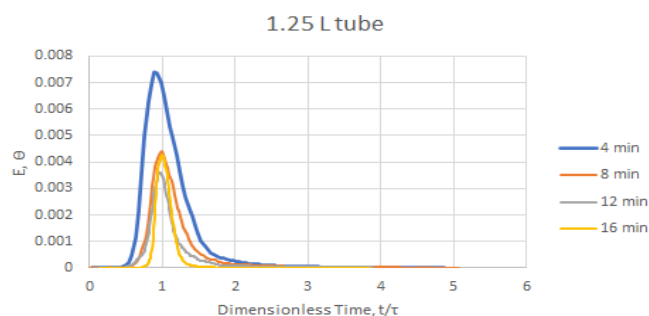
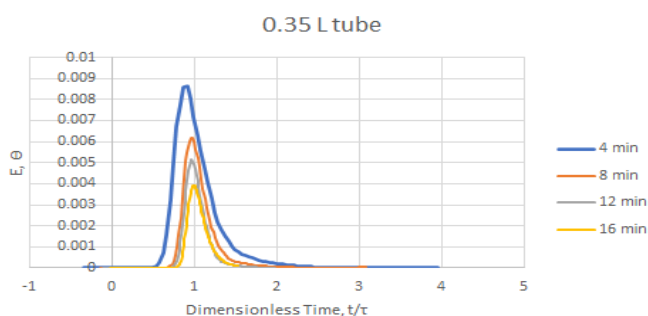
**Bulkhead Connection Panels** for mounting process hoses and HTF feed hoses



The **ATR Cabinet** provides noise insulation and protection from moving parts

**Anti-Vibration Table** with removable enclosure panels for mounting peripherals

**Bolt Down Feet** are used to secure the agitating platform and isolate vibration



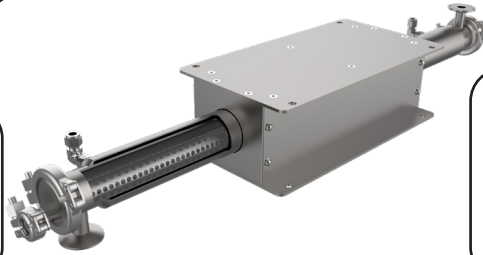
The Coflore® flow reactor range: the **Realistic Alternative** to Batch Chemical Manufacturing

# Coflore® ATR Reactor Tube

**Agitators** generate active mixing inside the reactor tube. Active mixing decouples mixing and plug flow from residence time. Agitators are interchangeable with different designs

**ATR Reactor Tubes** are available in two sizes 0.35 L & 1.25 L, these are interchangeable. Vertical reactor tube connections are used for process inlet/outlet or reactor tube interconnections

**End Caps** are used for connecting additional process inlets or thermowells. They can be removed to gain access for cleaning and testing of all wetted surfaces

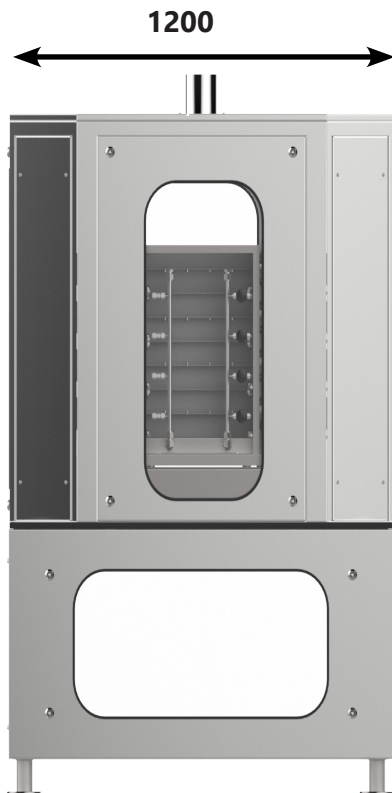


**Heat Transfer Jacket** consists of a spiral wound coil which transfers heating/cooling through the reactor tube wall. The heat transfer jackets are connected to the heat transfer manifold in either counter current or co-current configurations

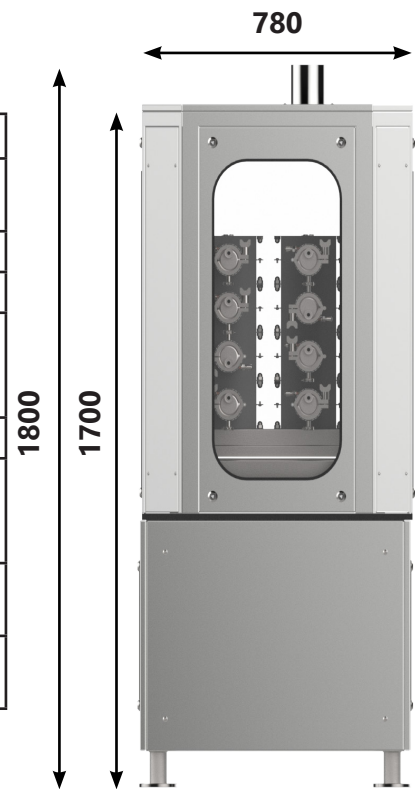
A wide range of processes can be operated with good heating and cooling control.

Coflore® ATR systems are comprised of a series of up to 8 tubes which provide high flexibility with multiple addition points and variable reactor volume providing great versatility:

- Reaction time <30 seconds to >3 hours
- Co-current and counter-current mode
- Slurries, immiscible fluids and gas/liquid mixtures
- Plug flow equivalent to >100 stirred tanks in series (1 hour reaction time in <3 metres of tube)
- Mass transfer rates 1-2 orders of magnitude higher than large batch reactors
- Blending times 1-2 orders of magnitude faster than batch reactors



<b>Maximum reactor mass</b>	120 kg
<b>Agitating platform mass</b>	150 kg
<b>Noise</b>	< 70 dBA
<b>Requirements;</b>	
<b>Compressed air</b>	3-7 bar, 13 CFM oil free clean air
<b>Maximum air pressure</b>	7 bar
<b>Power supply</b>	1ph + N+E 100-240 VAC 50/60 Hz 2A
<b>Compressed air connection</b>	10 mm push fit
<b>Heat transfer fluid connections</b>	1/2" swage-lock



		<b>Reactor throughput (L/day)</b>						
		<b>Reaction time</b>	30s	1m	5m	30m	1h	2h
<b>Reactor Volume</b>	0.35 L		1008	504	100.8	16.8	8.4	4.2
	1.25 L		3600	1800	360	60	30	15
	2.8 L		8064	4032	806.4	134.4	67.2	33.6
	10 L		28800	14400	2880	480	240	120