

## AMT TN-08

### Pressure Drop Across the Coflore® ATR 0.35 L Reactor Tube

#### Overview

This technical note looks at the pressure drop across an 0.35 L Coflore ATR reactor tube. The ATR is an actively mixed, tubular flow reactor which has been developed for the multi-kilogram production of material at the pilot scale. The ATR reactor agitation platform (Figure 1) can hold up to eight ATR reactor tubes of either 0.35 L or 1.25 L size. This provides the user with access to a variable reactor volume of between 0.35 L and 10 L (8x 1.25 L reactor tubes).

#### Pressure Drop Test Procedure

For this test, the agitation speed of the ATR was set at 4 Hz and the fluid direction was top-down. A single 0.35 L reactor tube was fitted with two ESI digital pressure transducers, one at the inlet and one at the outlet, and pressure data was recorded continuously using ESI USB software to determine the pressure drop across the reactor tube. Water was fed to the ATR at a various flowrates between 5 and 500 mL per minute. This spanned residence times of between 1 hour and 1 minute.

#### Results

The Coflore® ATR 0.35 L reactor tube was determined to have a negligible and consistent pressure drop across all flow rates in the region of 10 mBar. tested as shown in Graph 1. Pressure drop is effectively decoupled from reaction residence time.

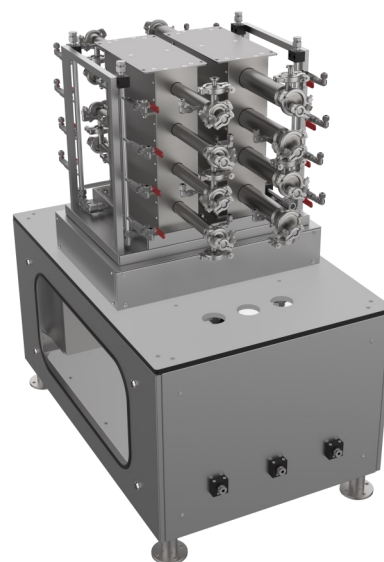
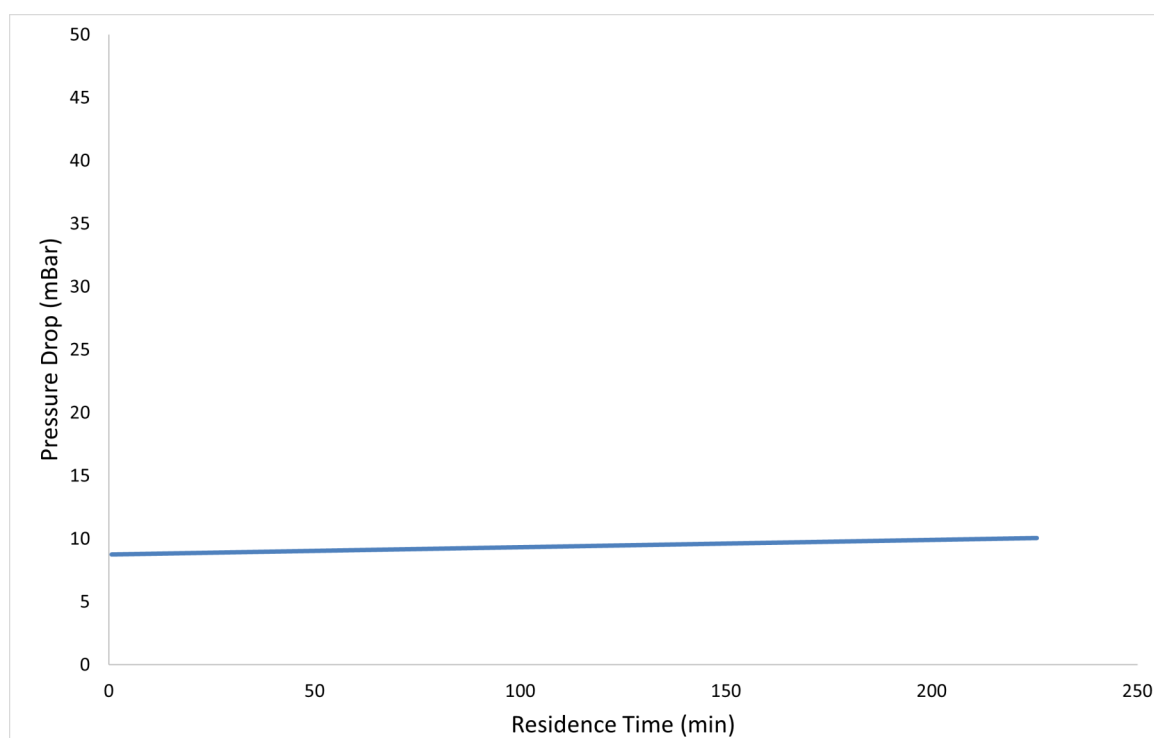


Figure 1: The Coflore ATR agitation platform with 4x 0.35 L reactor tubes and 4x 1.25 L reactor tubes.



Graph 1: Pressure drop at various residence times in the ATR 0.35 L reactor tube.