

# Continuous Flow Microchannel Reactor High Borosilicate Glass Customizable Chemical Synthesis System

Item Number: PL-WT05



## Introduction

Optimize chemical synthesis with this customizable continuous flow microchannel reactor featuring high borosilicate glass plates. Engineered for pharmaceutical, fine chemical, and industrial research laboratories to achieve highly precise temperature control, exceptional heat transfer, and safe, scalable process development operations.

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| Application                                     | Description   | Key Benefit   |
|---|---|---|
| <b>Fine Chemical Synthesis</b>                  | Continuous synthesis of specialty organic compounds, active ingredients, and intermediate reagents utilizing micro-scale channels for instantaneous mixing. | Eliminates localized concentration gradients, dramatically improving product yield and batch-to-batch consistency.                    |
| <b>Active Pharmaceutical Ingredients (APIs)</b> | Multi-step continuous synthesis of target drug candidates and sensitive chemical intermediates requiring precise residence time control.                    | Accelerates lead optimization, ensures exceptional purity profiles, and simplifies regulatory validation via steady-state processing. |
| <b>Agrochemical Formulation &amp; R&amp;D</b>   | High-throughput synthesis of pesticides, herbicides, and growth regulators under strictly controlled continuous flow parameters.                            | Enhances process safety during highly exothermic reactions and reduces raw material consumption during pilot-scale testing.           |
| <b>Nanoparticle &amp; Quantum Dot Synthesis</b> | Precision manufacturing of uniform silica nanoparticles (e.g., DMSN) and high-quality quantum dots using controlled laminar flow profiles.                  | Ensures extremely narrow particle size distributions and outstanding reproducibility by eliminating local temperature fluctuations.   |
| <b>Flavors &amp; Fragrance Extraction</b>       | Rapid synthesis and processing of volatile aromatic compounds and heat-sensitive essential oils under tight thermal constraints.                            | Prevents thermal degradation of delicate fragrance molecules thanks to the rapid millisecond-level heating and cooling capabilities.  |
| <b>Academic &amp; Industrial R&amp;D</b>        | High-performance laboratory research and chemical engineering education focusing on green chemistry, microfluidics, and flow chemistry kinetics.            | Provides visual observation of reaction dynamics through the transparent borosilicate glass plate, coupled with low reagent waste.    |

| Parameter  | Specification Details / Value                                    |
|--|--|
| <b>Product Model</b>                             | PL-WT05  |
| <b>Microchannel Plate Core Material</b>          | High Borosilicate Glass  |
| <b>Maximum Working Temperature (Glass Plate)</b> | Up to 500°C  |
| <b>Thermal Jacket Operating Range</b>            | -20°C to 200°C   |
| <b>Temperature Control Precision</b>             | ±1°C   |
| <b>Flow Control Mechanisms</b>                   | 5 Integrated Stainless Steel Needle Valves                       |
| <b>Fluidic Flow Regime</b>                       | Laminar Flow (Low Reynolds Number)                               |
| <b>Channel Dimensions</b>                        | Tens to hundreds of micrometers                                  |
| <b>System Scalability</b>                        | Supporting up to 12 pipelines for series/parallel configurations |

| Sub-Assembly                              | Component Name          | Quantity | Material Specifications        |
|---|-------------------------|----------|--------------------------------|
| <b>Single Microreactor Plate Assembly</b> | Reaction Plate          | 1        | High Borosilicate Glass        |
|   | Frame Body              | 1        | Corrosion-Resistant Plastic    |
|   | U-Clamp                 | 4        | 316 Stainless Steel            |
|   | Reaction Interface      | 4        | PTFE (Polytetrafluoroethylene) |
|   | Oil Bath Connector      | 2        | 304 Stainless Steel            |
| <b>Overall System Frame</b>               | Seal Plug / Stopper     | 4        | PTFE (Polytetrafluoroethylene) |
|   | Frame Body              | 1        | Aluminum Alloy                 |
|   | Internal Pipelines      | 12       | Stainless Steel                |
|   | Fluidic Interface Ports | 4        | 304 Stainless Steel            |
|   | Shock-Absorbing Sleeves | Multiple | Silicone                       |
|   | Control Valves          | 5        | Stainless Steel                |