

**Microflu Microfluidics Technology (Changzhou) Co., Ltd.**

## **Continuous Flow Systems**



### **MF-V9 Production-scale glass flow reactors**

MF-V9 is a modular glass flow reactor for process development, pilot & full-scale production. With integrated heat exchange, V9 gives optimal control for challenging chemistries & processing conditions.

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MF-V9 industrial flow reactors are modular glass reactors for the performance of continuous flow reactions at ton scale. V9 reactors are suitable for chemically challenging reactions under extreme processing conditions such as fast, highly exothermic reactions, reactions with aggressive media, reactions employing unstable intermediates or hazardous reactions not accessible under batch conditions.

The MF-V9 thousand-ton glass microreactor is a capacity upgrade without magnification structure based on the MF-V6 small scale glass microreactor. Compared with MF-V6, MF-V9 does not amplify the former unit hybrid structure to the same proportion, but transfers the unit hybrid structure of MF-V6 in parallel with 8 threads without amplification. Through the special design of 3-layer heat exchange, 2-layer process, and 1-layer sealing, the flux is increased by 15-20 times, and the heat exchange efficiency is further strengthened, so that the reaction can still be obtained in the case of high flux Good heat transfer control. At the same time, the two major factors of mass transfer and pressure drop are taken into account, ensuring mass transfer without amplification effect and small pressure drop, realizing the maximization of mass transfer and heat transfer efficiency, and safely and stably achieving the thousand-ton pilot production process.

### Salient features of MF-V9 glass flow reactors

- Available in integrated multilayer glass construction for mixing, reaction & heat transfer
- Micro channel with modular system to connect multiple reactors in series or parallel
- Suitable for various liquid-liquid, gas-liquid homogeneous & multi phase reactions
- Useful in photochemical & UV induced reactions
- Specially designed micro reactors from Microflu™ microchannel reactors used in various photochemical and UV induced reactions.
- Compatible with all reagents except hot concentrated alkali, molten alkali metal, hot concentrated H<sub>3</sub>PO<sub>4</sub>, HF, and strong corrosive agent, it can run stably for a long time.

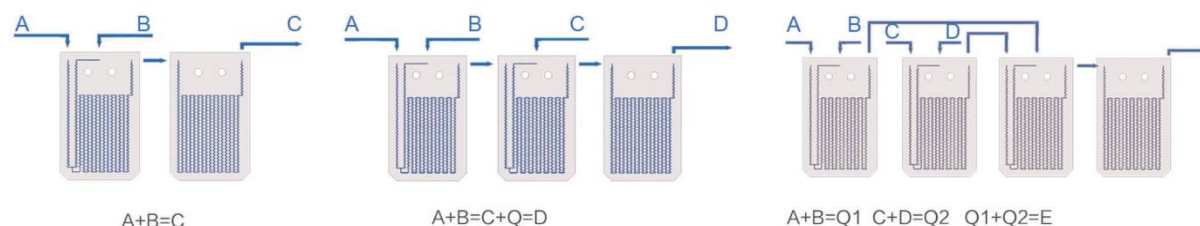
### Reaction type(Technological Process)

The free combination modular system configuration can connect multiple reactors in series or in parallel to realize one-step and multi-step synthesis reactions. The highly flexible modular design ensures that it can adapt to the requirements of various processes.

Series: used to delay the residence time and ensure the reaction conversion rate meets the technical requirements.

Parallel connection: used to increase production capacity to ensure that the production demand is guaranteed while the conversion rate is reached.

A+B=C (one-step series connection) A+B=C+Q=D (multi-step series connection) A+B=Q1 C+D=Q2 Q1+Q2=D (multi-step series connection + series connection).



### MF-V9 Production-scale glass flow reactors specifications

Flow rate: 0.5-3L/min (up to 180kg/h)

Flexible reactor volumes: 80ml  
 Wetted materials: Glass, PFA, PFA & FFKM Or 316L  
 Dimensions: 290×290×21mm

## MF-V9 Production-scale glass flow reactors applications

- Fast, strongly exothermic reactions
- Reactions with aggressive media & / or unstable intermediates
- Processes include nitrations, diazotisations & halogenations

## Specifications of MF-V9 glass flow reactor

MF-V9 Series Production-scale Glass Flow Reactors	
Model	MF-V9
Size	290×290×21mm
Material	Borosilicate Glass
Channel Size	1.4×25mm
Channel Length	2.4m
Volume	80ml
Surface to volume ratio(u)	/
Design temperature (°C)	-25°C-195°C *The difference between the glass temperature and the outside temperature is controlled within 70°C
Design pressure (bar)	0-16bar(-25°C-100°C); 0-10bar(100°C-195°C)
Flow rate	0.5-3L/min
Features/Advantages	Available in integrated multilayer glass construction for mixing, reaction & heat transfer; Micro channel with modular system to connect multiple reactors in series or parallel; Suitable for various liquid-liquid, gas-liquid homogeneous & multi phase reactions; *Useful in photochemical & UV induced reactions;
Process Case	·Mike addition reaction of ethylene glycol and acrylonitrile ·Nitration of Acetophenone ·anoparticle liposome preparation

