# Ultra Low Flow Control for Drug Delivery

Drug Delivery

## Application:

Drug Delivery/Device Design and Manufacture

## Challenge:

Managing extremely low flows for the release of therapeutic agents to optimize patient outcomes.

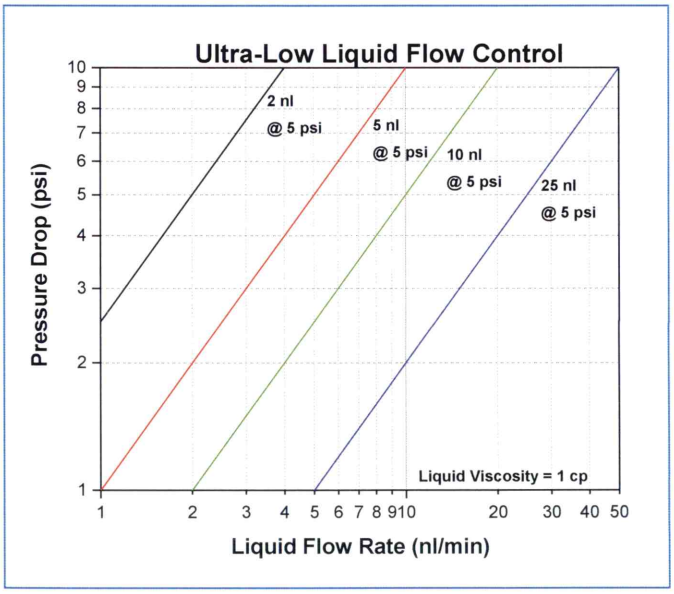
## Solution:

Porous Metal – A stable, biocompatible, non-reactive material that can be integrated into delivery systems and calibrated to flow various formulations as well as large and small molecules. Porous metal is ideal for providing highly dependable, repeatable flow control as well as precise diffusion and metering of fluids and drugs. This durable material can be designed to support multiple delivery modes for therapeutic agents.

## Flow Control/Controlled Release

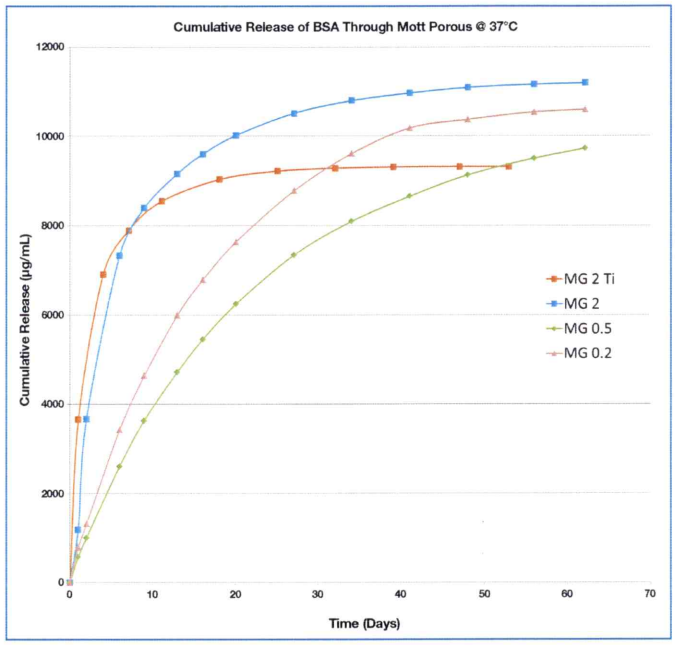
### Powered Devices – Pumps, Patch Pumps, and Powered Delivery Systems

In conventionally configured pumps or devices with a driving mechanism (battery, MEMS, spring), Mott's porous flow control elements can be designed to control flows as low as 1-2 nanoliters per minute. The components can be configured for different formulations, sizes and geometries.




## Sustained release

Mott porous metal can provide controlled and sustained release of drugs via diffusion based on Fick's Law. Elements can be engineered to deliver a drug over an extended time frame ranging from days to many months based on reservoir size, dosing requirements, efficacy and drug half-life. Mott can also provide porous metal solutions for specific molecules and formulations.




## Mixing/Delivery

Porous metal can be used to control the flow of dissimilar materials (Part A, Part B) and for mixing liquids, or gases into liquids. The torturous media flow path can optimize mixing and dwell time for dissimilar materials.

In addition, Mott's flow modeling capability can help you determine the optimal configuration to control flow rate of multiple materials – with the same driving force, or with different delivery pressures for each component.


mott corporation

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## Porous Metal – Biocompatible. Highly Inert

Porous metal is available in biocompatible materials including stainless steel and titanium. Mott Corporation routinely supplies components fabricated from 316L Series stainless steel and unalloyed titanium (ASTM 1580-07); plus many common and exotic metallurgies including zirconium, molybdenum, niobium; and from precious metals including gold, silver, and palladium. Inert construction makes porous metal well suited for a wide range of chemicals and formulations used in drug delivery applications.

## Mott Manufacturing Capabilities

Mott has over 50 years of expertise in manufacturing metal porous from sintered powder to produce various shapes and sizes, using established manufacturing methods and processes that meets or exceed flow and dimensional accuracies.

World class manufacturing, R&D and prototyping help customers to develop novel solutions to the most daunting technical challenges. Mott operates both Class 5 and Class 7 clean rooms, with dedicated production equipment solely for medical and life sciences production. Our manufacturing processes produce porous metal components offering controlled flow or filtration ratings with dimensions as small as 0.020" in diameter.

Mating porous metal with components for medical and life sciences applications can be accomplished in a variety of ways, such as welding (laser, ebeam, TIG), sinter-bonding or press-fitting to mating hardware. Depending on component configuration, over-molding with PEEK and other polymers is also possible, which can afford exceptional strength from "knitting" between the polymer and porous component.

Contact us at Quest@mottcorp.com with your next challenge. Or visit our website www.mottcorp.com for more information.

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