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Flow Restrictors in Breathing Equipment

Sintered Metal Flow Restrictors are incorporated into several types of breathing equipment that provide a critical gas flow control component design to help keep you safer and 'breathing easier'. *Airline Pilot Safety Oxygen Masks*, *SCUBA Diving Air Tank Regulators*, *Anesthesia Delivery Machines* and *Firefighter Air Packs* are all examples of Breathing Equipment applications that depend on a Mott flow restrictor to deliver the precise amount of gas in critical situations. Mott sintered metal provides the proper flow of gas without the need for adjustable controls or moving parts that require calibration or service commonly needed by other flow control devices.

In case of emergency, an airline pilot or firefighter dons a breathing mask to obtain the right amount of air or oxygen to sustain their life while trying to save the lives of others. These breathing devices and SCUBA diving tanks use a Mott flow restrictor to precisely control a steady rate of gas flow at a given pressure regardless of how hard the person is breathing. This feature allows the person to conserve their gas flow supply and provides the optimal amount per breath. Installation of a porous flow restrictor in anesthesia equipment insures that the proper amount of gas is delivered to the patient without the need for an expensive flow meter or control valve that could require adjustment or calibration prior to each use.

By replacing orifices, capillary tubes and micrometering valves with porous sintered metal flow restrictors, the designer can be assured of a constant gas flow at a given gas pressure without having to worry about clogging due to solid particles and without having to design for wide variations in flow due to improper setting or wear. A Mott flow restrictor consists of a 40-90% dense material such as 316L stainless steel or other corrosion resistant alloy that is manufactured to tightly controlled standards using powder metal technology and secondary densification operations to accurately control the permeability.

Unlike a precision drilled orifice, capillary tube or metering valve with one small hole for gas flow (often subject to clogging), sintered metal flow restrictors provide thousands of pores per square inch to provide a highly clog-resistant and reproducible gas flow. Each flow restrictor is individually calibrated to provide stable, smooth laminar gas flow for clean, dry gases such as oxygen, air, nitrogen, nitrous oxide, argon, helium, hydrogen and most other gases. An orifice requires higher differential operating pressures, with the inlet pressure normally 2 times the outlet pressure in order to produce a predictable flow range. Capillary tubes must be protected from bending or crushing during operation in order to avoid changing the flow – pressure drop characteristics. In addition, sintered metal flow restrictors are rugged, non-shedding porous media that have long term flow stability for reliable operation when called on for use in safety devices with long shelf storage or intermittent use.

For use in highly accurate gas or liquid flow control applications, flow restrictors can be provided in a variety of flexible designs for easy installation into most applications.