

# Self-Contained Breathing Apparatus

## Flow Restrictors, USA

<b>Customer:</b>	Aircraft Manufacturer
<b>Application:</b>	Provide gas flow control
<b>Products:</b>	Sintered bronze powder frits
<b>Primary Motive:</b>	Improve oxygen laminar flow into a SCBA
<b>Location:</b>	USA
<b>Project Date:</b>	2021 Onwards
<b>Division:</b>	Caribou, USA



### Customer Overview:

The customer is a provider of Oxygen Delivery Systems on board both commercial and military aircraft. This includes the systems that are both in the overhead compartments and the self-contained breathing apparatus (SCBA) utilized by the flight crew.

### Customer's Problem:

We have all heard that "In the unlikely event of there being a loss in cabin pressure, an oxygen mask will drop from the compartment above your head," but what about the flight crew?

Whereas the Oxygen supply for the individual passenger seats can be delivered through a centralised filter/flow controller by way of a fixed manifold, there is a need for a more portable apparatus to be used by flight attendants who still need to be able to move about the cabin.

### Porvair Solution:

The sintered bronze powder frits that are made at our Caribou plant are ideal for offering a key characteristic that is typically not desirable in most filtration applications, namely back pressure.

This attribute often has the negative connotation of pressure drop or delta P, but in the case of flow restriction the reverse is true.

Flow restrictors are normally used in applications where there is an overabundance of gas to be discharged which is held under high pressure.

If there was no restriction in the pathway then the flow through a simple valve would have a high degree of turbulence and would be difficult to control.

The use of our restrictive flow frits evens out the flow, so that it has a laminar flow (flat/straight) pattern at a reduced rate. The tertiary role of the frit is as a filter but the air supply normally very clean to start with.

### Project Overview:

Just as a filter is normally designed to achieve a desired particle retention with a specified pore and flow rate so does a flow restrictor.

The product that was developed for the SCBA needed to have the ideal pore size to control the flow. The particle size and distribution of the bronze powder, the particle shape, and metallurgy were all tried and tested.

The dimension of the individual frit was then sized to the corresponding capacity of the gas tank and the fitting/tubing to be used.

### Product and System Information:

Bronze flow restrictors.