

# Q&A

## 5500 psig Operating Systems

Recently, an SCBA manufacturer introduced a 5500 psig operating system that reportedly would become available for purchase in 2012. The introduction of this system has created questions in the market. The purpose of this document is to address these frequently asked questions:

### Are there benefits to the 5500 psig systems?

The benefits are minimal with a 5500 psig operating system. 5500 psig cylinders are slightly lighter and smaller than their equivalent duration 4500 psig counterparts.

### Are there disadvantages to a 5500 psig operating system?

There are a number of areas where this operating system could become a disadvantage for firefighters. Areas like upgradeability, interoperability with existing operating pressures, filling capabilities, inefficiencies with in-service air compressors, and the cost of the system.

### Is there patentable technology behind the 5500 psig systems?

No. Any cylinder manufacturer can make cylinders rated to 5500 psig, if they so choose. Currently, only one cylinder manufacturer is producing 5500 psig cylinders for SCBA applications.

### Are SCBA equipped with 5500 psig operating systems lighter weight than the FireHawk® M7 Air Mask with an equivalent 4500 psig duration cylinder?

No! The Firehawk M7 Air Mask remains one of the lightest SCBA on the market and has been since its introduction in 2007. The competitor's 5500 psig operating system only matches the weight of our Firehawk M7 Air Mask. Their overall weight savings with a 30-minute 5500 psig cylinder is less than 5%.

The table below shows a comparison of the FireHawk M7 Air Mask to the competitor, with an equivalent duration 4500 psig and 5500 psig system, and without a 5500 psig system.

Product	Total Weight	Weight Difference
FireHawk M7 Air Mask*	21.75 lbs	—
Competitor with 4500 psig	22.88 lbs	+ 1.13
Competitor with 5500 psig	21.75 lbs	—

\* Complete SCBA includes 4500 psig empty 30-minute cylinder, PASS device with batteries, lumbar pad, buddy breather, facepiece, and pneumatics.

### Are 5500 psig operating systems lower in profile than the FireHawk M7 Air Mask?

Not even close! The FireHawk M7 Air Mask still provides firefighters with the lowest profile SCBA on the market, at only 7 inches. The SCBA with a 5500 psig has a profile of 8.5 inches, a 17% larger profile than the Firehawk M7.

The table below shows a comparison of the profile heights between the Firehawk M7 and a competitor with a 30 minute 4500 psig and 5500 psig cylinder.

Product	Total Profile	Profile Difference
FireHawk M7 Air Mask*	7.00 inches	—
Competitor with 4500 psig	8.75 inches	+ 1.75
Competitor with 5500 psig	8.50 inches	+ 1.50

### What is required to have a 4500 psig upgraded to 5500 psig?

As stated by the manufacturer introducing the 5500 psig system, the upgrade requires a pressure reducer, pressure relief valve and pressure gauge console be replaced. In addition, new programming is required for their electronics.

### When responding to a mutual aid call, can I share 5500 psig cylinders with a neighboring department that uses 4500 psig cylinders?

Absolutely not! A department that has a 5500 psig operating system cannot provide cylinders to a neighboring department utilizing 4500 psig systems. The relief valve venting pressure in the 4500 psig system is well below the 5500 psig operating pressure. Connecting a 5500 psig cylinder to a 4500 psig operating system will automatically open the relief valve, venting breathing air to atmosphere. A department that has a 5500 psig system could utilize a 4500 psig cylinder, but will not provide the same service durations when the SCBA goes into low pressure alarm, creating a very dangerous condition for the firefighter.



## Can any compressor fill 5500 psig cylinders?

No. Not all air compressors are the same. Compressor fill ratings vary from 5000 psig to 6000 psig. As a compressor system approaches its maximum filling pressure, the filling efficiency diminishes. The majority of high pressure breathing air compressors incorporate air storage systems that allow users to cascade fill SCBA cylinders. Cascade filling maximizes the number of cylinders that can be filled by the system while minimizing the compressors run time. Cylinders with a 5500 psig operating pressure reduces these efficiencies.

The table below shows the filling capacity of a 6000 psig, four cylinder ASME cascade system:

Type	Number of 4500 psig Cylinder Fills	Number of 5500 psig Cylinder Fills
30-Minute Cylinder	29	16
45-Minute Cylinder	20	11

## Will my fill time increase using a 5500 psig cylinder?

Yes. Every time a cylinder is filled, the compression of air generates heat that results in a thermal expansion of the air in the cylinder. After the air in a cylinder has cooled down, the pressure in that cylinder will no longer read full, requiring the user to top off the cylinder. The higher filling pressure will generate more heat, resulting in a greater loss in pressure. This will require more filling time a 5500 psig cylinder than a 4500 psig cylinder of equal volume.

## Does 5500 psig cylinder follow the same inspection and testing criteria as 4500 psig cylinders?

Yes. All inspections and hydrostatic testing protocols remain unchanged from a 4500 psig cylinder.

## Is the CGA coupling different for 5500 psig cylinder than it is for 4500 psig cylinder?

No. CGA 347 coupler allows for cylinder pressures up to 5500 psig. The same CGA 347 coupler can be used with a 4500 psig or 5500 psig operating system and may result in an unsafe condition for the firefighter. The two unsafe conditions are 1) over pressurization of a 4500 psig SCBA when a 5500 psig cylinder is connected and 2) inaccurate function of the 5500 psig system's low pressure warning devices and service time remaining features.

**Note:** This bulletin contains only a general description of the products shown. While uses and performance capabilities are described, under no circumstances shall the products be used by untrained or unqualified individuals and not until the product instructions including any warnings or cautions provided have been thoroughly read and understood. Only they contain the complete and detailed information concerning proper use and care of these products.



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