



Self-Contained Breathing Apparatus Basics

Water and Wastewater Workshop
March 27, 2025
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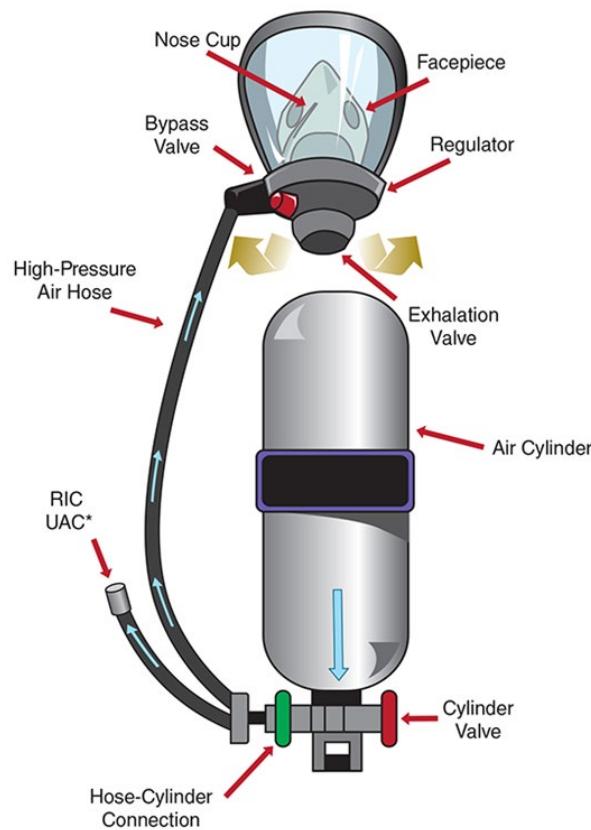
Outline

In this session we will discuss:

- SCBA Components
- Donning SCBA
- SCBA Inspection and Cleaning

SCBA Components

Open-Circuit SCBA Operation



* Rapid Intervention Crew Universal Air Coupling

SCBA Components



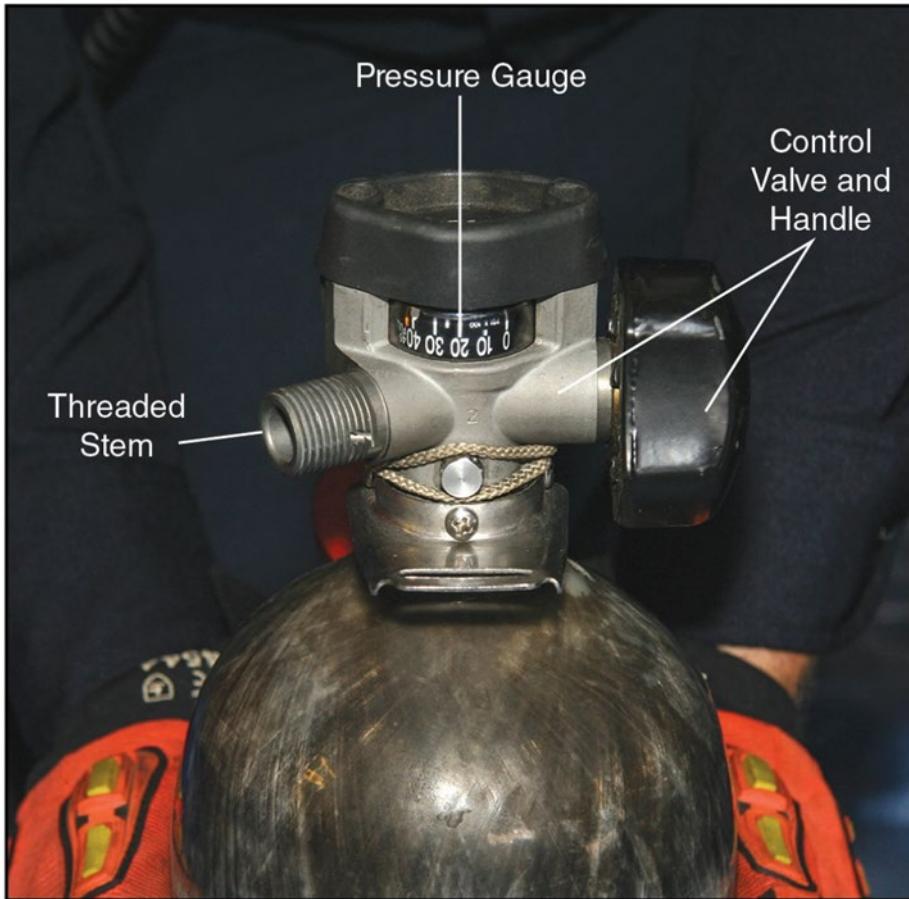
Breathing Air Cylinder Capacities

Table 5.1
Breathing Air Cylinder Capacities

Rated Duration	Pressure	Volume
30-minute	2,216 psi (15 290 kPa)	45 ft ³ (1 270 L) cylinders
30-minute	4,500 psi (31 000 kPa)	45 ft ³ (1 270 L) cylinders
45-minute	3,000 psi (21 000 kPa)	66 ft ³ (1 870 L) cylinders
45-minute	4,500 psi (31 000 kPa)	66 ft ³ (1 870 L) cylinders
60-minute	4,500 psi (31 000 kPa)	87 ft ³ (2 460 L) cylinders

- Rated duration does not indicate the actual amount of time that the cylinder will provide air.

Air Cylinder Assembly



Cylinder contains breathing air under pressure

Constructed of steel, aluminum, aluminum wrapped in fiberglass, or a Kevlar/carbon composite

Cylinders weigh 8 to 20 pounds (4 to 9.5 kg)

Regulator Assembly



Depending on SCBA model, the regulator will have valves for normal and emergency operations

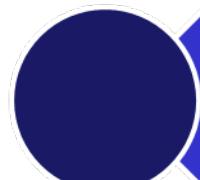
Mainline valve

Bypass valve

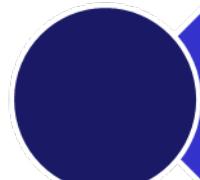
Facepiece Assembly



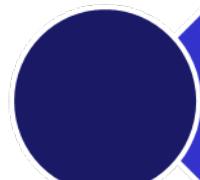
Facepiece Fit



Qualitative or quantitative fit test required



Facial hair that prevents a complete seal is prohibited



Eyeglasses are prohibited if the side frames pass through the seal area



Contact lenses are allowed if firefighter demonstrates successful long-term use



Additional SCBA Components



Remote pressure gauge



End-of-service-time indicator

Rapid intervention crew universal air coupling



Additional SCBA Components



Emergency escape breathing support system (EEBSS)

Heads up display (HUD)



Integrated PASS control module

Alert lighting systems

Voice communications systems

SCBA Inspection Prior To Donning



- ✓ Check air cylinder gauge and remote gauge
- ✓ Fully extend facepiece and harness straps
- ✓ Check valve function
- ✓ Test low-pressure alarm
- ✓ Test PASS device
- ✓ Check battery-powered functions

Donning Unmounted SCBA



SCBA positioned on the ground in front of the firefighter



All straps extended



Donning The Facepiece

Most facepieces are donned using similar steps, regardless of differences

- Rubber harness or mesh skull cap
- Some have more straps than others
- Regulator may be attached to facepiece or mounted on the waist belt or shoulder harness
- Shape and size of facepiece lens may differ

Donning The Facepiece

Fully extend straps

Check the seal, exhalation valve, and all connections

Ensure no hair is between skin and facepiece seal

Center chin in chin cup and harness at rear of the head

Tighten facepiece straps by pulling to the rear



Inspection And Maintenance Of SCBA

Department schedule determines frequency of inspection

Inspections typically performed daily, weekly, or whenever firefighters report for duty

Period between inspections must not exceed one week

Must be inspected by SCBA repair technician annually and after any repairs

Daily/Weekly Inspections



Facepiece

Backplate
and harness
assembly

Breathing air
cylinder
assembly

Hoses

Low-pressure
alarm

Regulator

Pressure
indicator
gauges

Integrated
PASS

Daily/Weekly Inspections



Identify wear and tear, damage, and potential problems before they result in failure during an emergency

Should be documented to record findings, report problems, and show trends

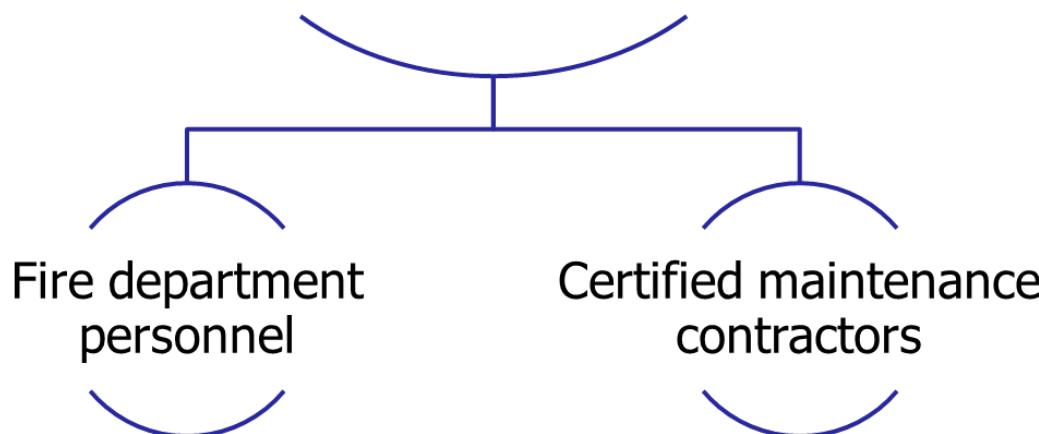
Daily/Weekly Inspections

During the inspection, the inspector should check the hydrostatic test date label on the air cylinder to see if the cylinder is due for hydrostatic testing to check for flaws and leaks.



Annual SCBA Inspection And Maintenance

Must be performed by specially trained, factory-qualified technicians according to manufacturer's recommendations



Breathing Air

Thing to remember about the air in the cylinders:

- Must be changed at least every 12 months.
- Fill stations must have had an air quality test completed within the last 6-months
- You should have a copy of the air quality certificate posted in your facility
- Cylinder must be within their hydrostatic testing date to be filled
 - Every 5 years



Questions?

Credit for training material to the International Fire Service Training Association

