

DESCRIPTION

Chemori 227[®] is a trademark of Chemori Americas' HFC-227ea, Heptafluoropropane. Chemori 227[®] is an effective fire extinguishing agent that can be used on many types of fires ranging from sensitive electrical equipment to industrial applications using flammable liquids. Chemori 227[®] is ideal for applications where clean-up of other medium presents a problem, where an electrically non-conductive medium is needed and where people compatibility is an overriding factor. When environmental impact becomes a consideration, Chemori 227[®] is particularly useful. It has Zero ozone-depleting potential, low global warming potential and short atmospheric lifetime. These characteristics make it suitable not only for new installations using Chemori Americas' total flooding system, but also for Halon 1301 replacement applications. Chemori 227[®] is an odorless, colorless liquefied compressed gas. It is stored as a liquid and dispensed into the hazard as a colorless, electrically non-conductive vapor that is clear and does not obscure physical vision. It leaves no residue and has acceptable toxicity for use in occupied spaces at design concentration. Chemori 227[®] extinguishes a fire by a combination of chemical and physical mechanisms. Chemori 227[®] does not displace and therefore is safe for use in occupied spaces without fear of oxygen deprivation.

PHYSICAL AND CHEMICAL CHARACTERISTICS

Chemical Name	Heptafluoropropane (CF ₃ CHFCF ₃)
General	Colorless, Odorless Liquefied Gas
Molecular Weight	170.03
Boiling Point	-16.4°C/2.48°F
Freezing Point	-131°C/-203.8°F
Vapor Pressure @ 21°C/70°F	58.8 psia
Critical Temperature	101.7°C/215.1°F
Critical Pressure (psia)	422.3 psia
Vapor Density (AIR=1)	6.04
Water Reactive	No
Specific Gravity (H ₂ O=1)	1.46
Percent Volatile (by volume)	n/a
Evaporation Rate (Butyl acetate=1)	n/a
Viscosity @ 20°C/68°F	n/a
Water Solubility (V/V @ 20°C/68°F)	260mg/L
Ozone Depletion Potential	0
Estimated Atmospheric Lifetime (years)	31-42

Chemori 227[®] fully complies with the standards of ASTM D6064 and NFPA 2001 and has achieved a minimum purity of 99.95 percent and less than 10 ppm of moisture. It has less than 1 ppm acidity as HF. The non-volatile residue is less than 0.05g/100ml.



Pre-Engineered Clean Agent Cylinders

DESCRIPTION

Each of the basic sizes can be filled with one pound increments to meet the exact amount of HFC-227ea Clean Agent required, within their fill ranges. There are two types of cylinders that are used in the Pre-Engineered Clean Agent System. The CR 3* through the CR 18* are manufactured, tested and stamped in accordance with UL 299. The CR 35* through the CR 520* are manufactured, tested and stamped in accordance with DOT 4BW500 or DOT 4BA500.

Model:	System Operating Pressure:	Temperature Range:
CR 3* through the CR 18*	240 psi (16.9 kg _f /cm ²) at 70°F (21.1°C)	32°F (0°C) to 130°F (54.4°C)
CR 35* through the CR 520*	360 psi (25.3 kg _f /cm ²) at 70°F (21.1°C)	32°F (0°C) to 130°F (54.4°C)

All cylinders are equipped with a brass, high flow, pressure differential type valve. The 3 lb through the 18 lb cylinders have a 1/2" female NPT outlet. The 35 lb and 70 lb cylinders have a 1" female NPT outlet. The 140 lb and 240 lb cylinders have a 1-1/2" female NPT outlet. The 360 lb and 520 lb cylinders have a 2-1/2" male NPT outlet. The valve is pressure operated that utilizes the pressure from the cylinder to activate the valve and allows the Clean Agent to discharge. The cylinders have the following electric solenoid available as an option:

- 12 VDC solenoid
- 24 VDC solenoid
- 120 VAC solenoid with local manual control



Base Model	Features	Cylinder Size	Max Fill at 70 lb/ft ³	Min Fill at 30 lb/ft ³	Valve Size	Cylinder Diameter	Height to Discharge Outlet	Total Height with Electric Control	Total Height with LMC Head
CR 3*	Basic Unit	3 LB	3 LB	1 LB	1/2"	3.00	14.805	18.86	N/A
CR 3L*	Local Manual					3.00		N/A	18.86
CR 6*	Basic Unit	6 LB	6 LB	3 LB	1/2"	4.170	16.535	20.59	N/A
CR 6L*	Local Manual					4.170		N/A	20.59
CR 12*	Basic Unit	12 LB	12 LB	6 LB	1/2"	6.00	15.50	19.50	N/A
CR 12L*	Local Manual					6.00		N/A	19.50
CR 18*	Basic Unit	18 LB	18 LB	12 LB	1/2"	6.00	21.00	25.00	N/A
CR 18L*	Local Manual					6.00		N/A	25.00
CR 35*	Basic Unit	35 LB	35 LB	16 LB	1"	10.00	16.29	19.18	N/A
CR 35L*	Local Manual					10.00		N/A	19.18
CR 70*	Basic Unit	70 LB	70 LB	31 LB	1"	10.00	28.17	31.06	N/A
CR 70L*	Local Manual					10.00		N/A	31.06
CR 140**	Basic Unit	140 LB	140 LB	66 LB	1-1/2"	12.75	38.03	43.32	N/A
CR 140L*	Local Manual					12.75		N/A	43.32
CR 240**	Basic Unit	240 LB	240 LB	109 LB	1-1/2"	16.00	39.33	44.62	N/A
CR 240L*	Local Manual					16.00		N/A	44.62
CR 360**	Basic Unit	360 LB	360 LB	163 LB	2-1/2"	16.00	55.32	62.68	N/A
CR 360L*	Local Manual					16.00		N/A	62.68
CR 520**	Basic Unit	520 LB	520 LB	241 LB	2-1/2"	20.00	55.95	61.31	N/A
CR 520L*	Local Manual					20.00		N/A	61.31

* use with electric solenoid
 ** use with electric solenoid or piston actuator

Clean Agent Cylinders

DESCRIPTION

The Clean Agent cylinders are manufactured, tested and stamped in accordance with DOT 4BW500 or DOT 4BA500. All cylinders are equipped with back pressure type valve. A piston in the valve bore is equipped with a rubber seal that keeps the HFC-227ea Clean Agent under pressure within the cylinder. A small hole in the piston allows cylinder pressure to be equalized on both sides of the piston. Since the area at the top of the piston is greater than the area at the bottom of the piston, the net force seals the piston against the valve discharge outlet. When the cylinder pressure on the top of the piston is relieved by means of automatic or manual activation, there is only cylinder pressure acting against the piston seal, and the piston slides to it's full open position, allowing cylinder discharge through the distribution piping network.

Attached to the bottom of the cylinder valve is a siphon tube, which is straight and runs from the top of the cylinder to the bottom of the cylinder. The cylinder must be installed in an upright position (valve on top).

There is a 1/8" NPT outlet stamped "P" on the cylinder valve. This outlet transmits cylinder pressure to an optional low pressure supervisory switch, which when used, monitors the internal pressure of the cylinder. Another 1/8" NPT outlet stamped "M" on the cylinder valve is available for use as a pressure source to drive the piston actuators on a multiple cylinders system or to actuate a pressure operated switch in the event of the cylinder discharge.

Cylinder Model

HFC-227ea Clean Agent cylinders are available in the following capacities:

Part Number	Cylinder Size	Max Fill at 70 lb/ft ³	Min Fill at 30 lb/ft ³	Water Capacity (L)	Valve Size
CR 90020-E	20 LB	20 LB (9 kg)	9 LB (4 kg)	8.5 (300 cu ft)	1" Valve
CR 90035-E	35 LB	35 LB (16 kg)	16 LB (7 kg)	14.2 (502 cu ft)	1" Valve
CR 90070-E	70 LB	71 LB (32 kg)	31 LB (14 kg)	28.4 (1,003 cu ft)	1" Valve
CR 90100-F	100 LB	101 LB (46 kg)	44 LB (20 kg)	42.4 (1,500 cu ft)	1" Valve
CR 90150-E	150 LB	152 LB (69 kg)	66 LB (30 kg)	60.7 (2,143 cu ft)	1 1/2" Valve
CR 90250-E	250 LB	253 LB (115 kg)	109 LB (49 kg)	101.2 (3,574 cu ft)	1 1/2" Valve
CR 90375-E	375 LB	379 LB (172 kg)	163 LB (74 kg)	151.7 (5,358 cu ft)	2 1/2" Valve
CR 90560-E	560 LB	561 LB (254 kg)	241 LB (109 kg)	226.6 (8,002 cu ft)	2 1/2" Valve

Note: Each of the basic sizes can be filled with one pound increments to meet the exact amount of HFC-227ea Clean Agent required, within their fill ranges.

Temperature Range: 32°F (0°C) to 130°F (54.4°C)

System Operating Pressure: 360 psi at 70°F (25.3 kg./cm² at 21.1°C)

Cylinder Bracket

The cylinder bracket is manufactured from galvanized steel band formed to the radius of the cylinder with flanges for bolting to the continuous slot metal framing channel of 12-gauge steel with corrosion resistant paint or galvanized. The channel must be supplied by the installer. The cylinder bracket must be secured to a surface that the bracket will withstand a load up to 5 times of the cylinder weight. This precaution is to have the bracket safely supports the weight of the cylinder and the reaction force of the HFC-227ea Clean Agent when discharge.

Part Number	Cylinder O.D	D	E	F	G	Bracket Part #
CR 90020-E	10.75"	11"	14"	12.6"	2"	CR60139
CR 90035-E	10.75"	11"	14"	12.6"	2"	CR60139
CR 90070-E	10.75"	11"	14"	12.6"	2"	CR60139
CR 90100-F	12.80"	13"	16.05"	14.65"	2"	CR60780
CR 90150-E	12.80"	13"	16.05"	14.65"	2"	CR60780
CR 90250-E	16.00"	16.25"	19.2"	17.7"	2"	CR60760
CR 90375-E	16.00"	16.25"	19.2"	17.7"	2"	CR60760
CR 90560-E	20.00"	20.25"	23.2"	21.7"	2"	CR60770

For the 20 lb. to 250 lb. cylinders - One cylinder bracket must be used

For the 375 lb. to 560 lb. cylinders - Two cylinder brackets must be used



Cylinder Dimension

Part Number	A	B	C
CR 90020-E	10.8"	13.8"	18.5"
CR 90035-E	10.8"	18.7"	23.5"
CR 90070-E	10.8"	27.2"	31.9"
CR 90100-F	12.8"	28"	32.9"
CR 90150-E	12.8"	37.4"	42.9"
CR 90250-E	16"	39.8"	42.9"
CR 90375-E	16"	57.1"	64.9"
CR 90560-E	20"	55.7"	63.6"



DESCRIPTION

The 800 lb and 1000 lb cylinders are filled with one pound increments in order to meet the exact amount of agent required.

Part Number	Cylinder Size	Max Fill at 70 lb/ft ³	Min Fill at 30 lb/ft ³	Valve Size	Diameter	Total Height	Height to Discharge Outlet
CR 91000-E	1000 LB	1008 LB	439 LB	4" Valve	30.00"	64.154"	54.364"
CR 90800-E	800 LB	806 LB	353 LB	4" Valve	30.00"	56.792"	47.002"

By using Chemori's Flow Calculation Software Version CR 4.0, the two-phase and the two-component flow of agent and nitrogen through the distribution piping network in quasi-steady state from the initiation of the discharge to the final gas blow down can be estimated and predicted. The cylinder is equipped with the stainless steel valve that offers excellent flow characteristics for the liquefied gas, allowing for long pipe runs and has a greater coverage area.

Temperature Range: 32°F (0°C) to 130°F (54.4°C)
Operating Pressure: 360 psi at 70°F (25.3 kg/cm² at 21.1°C)

The cylinder is equipped with a stainless steel back pressure type valve in which a piston installed within the valve is equipped with a rubber seal that keeps the clean agent under pressure within the cylinder. A small hole in the piston allows the pressure within the cylinder to be equalized on both sides of the piston. Since the area at the top of the piston is greater than the area at the bottom of the piston, the net force seals the piston against the valve discharge outlet. When the cylinder pressure on the top of the piston is relieved by means of automatic or manual activation, there is only cylinder pressure acting against the piston seal; hence, the piston slides to its full open position, allowing cylinder discharge through the distribution piping network.

The cylinder must be installed in an upright position (valve on top) in which each cylinder installation shall use a top plug adapter. The available accessories include electric solenoid, pressure gauge, liquid level indicator, and bracket as described in the following manner.

4" Valve Accessories

Description	Usage
Electric Solenoid available in: - 24 VDC 15 Watts - 12 VDC 15 Watts	To automatically start and operate the clean agent discharge based on the operating specification requirement
Low Pressure Supervisory Switch	To monitor the internal pressure of the cylinder
Pressure Gauge, 360 psi	For quick visual inspection of the cylinder's internal pressure
Piston Actuator	For use as a pressure operated switch in the event of the cylinder discharge of multiple cylinders installation
Liquid Level Indicator	To measure the weight of the clean agent inside of the cylinder. Highly recommended for ease of maintenance
Cylinder Bracket	To support the weight of cylinder and the reaction force of the clean agent during discharge



P/N: CR 91000-E



P/N: CR 90800-E



900 lb Clean Agent Cylinder

DESCRIPTION

The 900 lb cylinder is filled with one pound increments in order to meet the exact amount of agent required.

Part Number	Cylinder Size	Max Fill at 70 lb/ft ³	Min Fill at 30 lb/ft ³	Valve Size	Diameter	Total Height	Height to Discharge Outlet
CR 90900-E	900 LB	906 LB	353 LB	4" Valve	30.00"	56.792"	47.002"

By using Chemori's Flow Calculation Software Version CR 4.0, the two-phase and the two-component flow of agent and nitrogen through the distribution piping network in quasi-steady state from the initiation of the discharge to the final gas blow down can be estimated and predicted. The cylinder is equipped with the stainless steel valve that offers excellent flow characteristics for the liquefied gas, allowing for long pipe runs and has a greater coverage area.

Temperature Range: 32°F (0°C) to 130°F (54.4°C)
 Operating Pressure: 360 psi at 70°F (25.3 kg/cm² at 21.1°C)

The cylinder is equipped with a stainless steel back pressure type valve in which a piston installed within the valve is equipped with a rubber seal that keeps the clean agent under pressure within the cylinder. A small hole in the piston allows the pressure within the cylinder to be equalized on both sides of the piston. Since the area at the top of the piston is greater than the area at the bottom of the piston, the net force seals the piston against the valve discharge outlet. When the cylinder pressure on the top of the piston is relieved by means of automatic or manual activation, there is only cylinder pressure acting against the piston seal; hence, the piston slides to its full open position, allowing cylinder discharge through the distribution piping network.

The cylinder must be installed in an upright position (valve on top) in which each cylinder installation shall use a top plug adapter. The available accessories include electric solenoid, pressure gauge, liquid level indicator, and bracket as described in the following manner.



P/N: CR 90900-E

4" Valve Accessories

Description	Usage
Electric Solenoid available in: - 24 VDC 15 Watts - 12 VDC 15 Watts	To automatically start and operate the clean agent discharge based on the operating specification requirement
Low Pressure Supervisory Switch	To monitor the internal pressure of the cylinder
Pressure Gauge, 360 psi	For quick visual inspection of the cylinder's internal pressure
Piston Actuator	For use as a pressure operated switch in the event of the cylinder discharge of multiple cylinders installation
Liquid Level Indicator	To measure the weight of the clean agent inside of the cylinder. Highly recommended for ease of maintenance
Cylinder Bracket	To support the weight of cylinder and the reaction force of the clean agent during discharge



1200 lb Clean Agent Cylinder

DESCRIPTION

The CR 91200-E 1200 lb. cylinder is filled with one pound increments from a minimum of 519 lb. to a maximum of 1211 lb., to meet the exact amount of agent required. The quantity of agent required for each enclosure can be calculated through Chemori's software, version CR 4.0, which contains a sophisticated calculation routine for predicting the two-phase as well as two-component flow of agent and nitrogen through the distribution piping network in quasi-steady state from the initiation of the discharge to final gas blow down. The cylinder is then super-pressurized with dry nitrogen to 360 psi at 70°F to provide extinguishment in 10 seconds or less. The 4" stainless steel valve offers excellent flow characteristics for the liquefied gas, allows for long pipe runs and has a greater coverage area. This is the largest Clean Agent cylinder currently manufactured and designed for very large applications. The 1200 lb. cylinder is manufactured, tested and stamped in accordance with DOT 4BW500.

Temperature Range: 32°F (0°C) to 130°F (54.4°C)

System Operating Pressure: 360 psi at 70°F (25.3 kg/cm² at 21.1°C)

The cylinder is equipped with a 4" stainless steel back pressure type valve and a 4" Victaulic male outlet. A piston in the valve bore is equipped with a rubber seal that keeps the Clean Agent under pressure within the cylinder. A small hole in the piston allows cylinder pressure to be equalized on both sides of the piston. Since the area at the top of the piston is greater than the area at the bottom of the piston, the net force seals the piston against the valve discharge outlet. When the cylinder pressure on the top of the piston is relieved by means of automatic or manual activation, there is only cylinder pressure acting against the piston seal, and the piston slides to its full open position, allowing cylinder discharge through the distribution piping network.

Attached to the bottom of the cylinder valve is a siphon tube, which is straight and runs from the top of the cylinder to the bottom of the cylinder. The cylinder must be installed in an upright position (valve on top). Each cylinder installation shall use a top plug or a top plug adapter. The electric solenoid uses either a 24 VDC 15 Watts (CR 91225-2) or a 12 VDC 15 Watts (CR 91225-1).

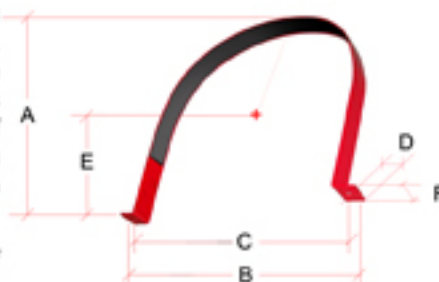
There is a 1/8" NPT outlet stamped "P" on the cylinder valve. This outlet transmits cylinder pressure to an optional low pressure supervisory switch, which when used, monitors the internal pressure of the cylinder. Another 1/8" NPT outlet stamped "M" on the cylinder valve is available for use as a pressure source to drive the piston actuators on a multiple cylinders system or to actuate a pressure operated switch in the event of the cylinder discharge. In multiple cylinders installation, when manifolded together, a maximum of six (6) 1200 lb. cylinders (also known as slave cylinders) can be operated to discharge using this "M" port through the piston actuator.

The cylinder is equipped with a 360 psi pressure gauge for quick visual INSPECTION of the cylinder's internal pressure.

Liquid level indicator is available as an option for measurement of weight of the Clean Agent in the cylinder and is highly recommended for ease of maintenance.



P/N: CR 91200-E



P/N: CR 60790

Part Number	Cylinder Size	Max Fill at 70 lb/ft ³	Min Fill at 30 lb/ft ³	Valve Size	Diameter	Total Height	Height to Discharge Outlet
CR 91200-E	1200 LB	1211 LB	519 LB	4" Valve	30.00"	71.516"	61.726"

Cylinder Bracket

The cylinder bracket is manufactured from galvanized steel band formed to the radius of the cylinder with flanges for bolting to the continuous slot metal framing channel of 12-gauge steel with corrosion resistant paint or galvanized. The channel must be supplied by the installer. The cylinder bracket must be secured to a surface that the bracket will withstand a load up to 5 times of the cylinder weight. This precaution is to have the bracket safely supports the weight of the cylinder and the reaction force of the HFC-227ea Clean Agent when discharge.



P/N: CR 60772

Part Number	Diameter	A	B	C	D	E	F
CR 60790	30.00"	29.125"	33.250"	31.750"	1.5"	14.00"	2"
CR 60772	30.00"	4.500"	11.500"	10.000"	1.5"	N/A	2"



Clean Agent Cylinder Valves



1" Brass Valve
Brass, ASTM B-16
P/N: CR 90001



1 1/2" Brass Valve
Brass, ASTM B-16
P/N: CR 90002



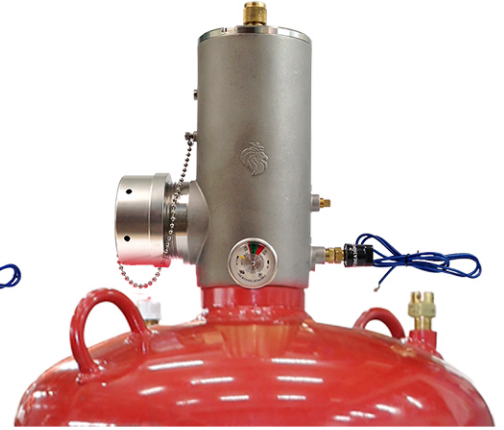
2 1/2" Brass Valve
Brass, ASTM B-16
P/N: CR 90003



1" Stainless Steel Valve
SS, AISI 304/ 316/ 316L
P/N: CR 90001-SS



1 1/2" Stainless Steel Valve
SS, AISI 304/ 316/ 316L
P/N: CR 90002-SS



2 1/2" Stainless Steel Valve
SS, AISI 304/ 316/ 316L
P/N: CR 90003-SS



4" Stainless Steel Valve
SS, AISI 304/ 316/ 316L
P/N: CR 90004



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