

SFI COLD VAN

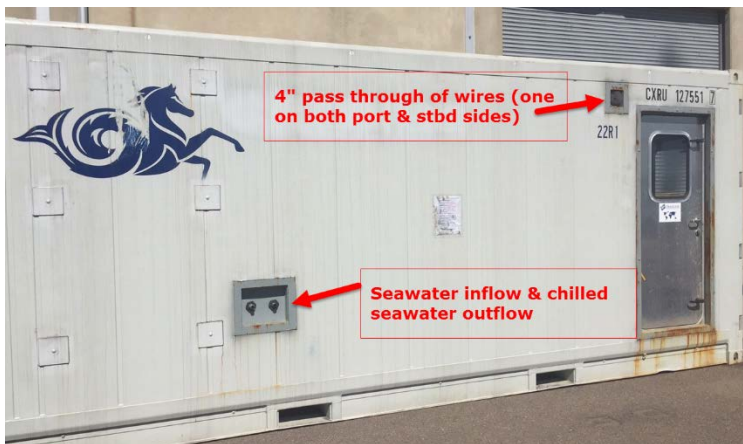
Details of Cold Van

The Cold Van is a standard ISO 20ft refrigeration container that has been modified to meet safety requirements for human occupied portable lab space container. It is design with an internal unistrut system to allow a reconfigurable lab space, has standard 120VAC / 20amp 60Hz power outlets throughout the van, lighting, adjustable height wood work benches and a 420 gallon cold water pump system providing cold seawater for scientific use. The van readily holds 1C internal and chills tropical surface seawater (mid 20's C) to 3-4C within a few hours. It has a "Carrier Thinline T-318" refrigeration unit capable of holding -29C internal with external temperatures of 38C and requiring standard 3 phase, 460 volts AC, 60 cycle, 60 amp power. The van comes with an instruction manual for each system, spares for cold water system, external hoses and hardware for adding equipment or benches to and internal unistrut system. The entire van weight ~9000 lbs.



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Entrances & Access: There are two marine grade Freeman entrances doors (one side, one aft), fully operational cargo doors, and a Freeman emergency escape hatch with a deployable escape ladder in the rooftop. A commercial grade refrigeration curtain helps maintain thermal integrity. An external seawater inflow and chilled seawater outflow valves on the port side of van as well as two 4" pass through pipes with foam stuffing (one port side, one stbd side) for wiring also help maintain thermal integrity.



Refrigeration Unit: The refrigeration unit is a commercial grade Carrier_Thinline_T-318 unit. The industry standard for quality, performance and long-term reliability. Key Features are:



- The reliable workhorse of the industry: Carrier’s field-proven 06D compressor.
- Non-ozone-depleting HFC-134a refrigerant.
- State-of-the-art electrostatically coated copper fin, tube, and more efficient formed condenser coil for better airflow, coated with Carrier’s time-tested and patent electrocoating process, or E-coating, for superior corrosion protection.
- Modified evaporator coil orientation allows for better airflow and improved defrost performance.
- Precisely aligned, high-efficiency evaporator fan motors and vaneaxial fans reduce fan heat and improve cooling capacity.
- Lighter, more efficient 3-phase motor; optimized condenser fan adds to improved efficiency
- Micro-Link® 3 microprocessor controller. Program upgrades and DataCorder™ downloads in seconds with the DataBank™ PC card. Backward compatibility with Micro-Link®2i controller ensures seamless transition to Micro-Link 3 controller.
- Auto defrost takes the guesswork out of setting defrost intervals.
- The receiver has an aluminized coating for corrosion resistance.

The unit has a temperature range of 2°C to -29°C to assuming an external ambient temperature of 38°C (100°F).

Cooling Capacity: Ambient @ 38°C (100°F) with Industry Standard Carrier 06D Reciprocating Compressor, HFC-134a

Temperature	Watts	Btu/hr
2°C (35°F)	10,250	35,000
-18°C (0°F)	6,010	20,500
-29°C (-20°F)	3,100	10,600



Cold Lab & Cold Water System: The cold lab van temperature can be set from -7C to 12C. Obviously the more you leave the door open, the harder it is to maintain temperature. The cold water system is chilled by the internal van/lab temperature and is designed to connect to the vessel’s seawater supply. Bringing in roughly filtered (coarse filtered) surface seawater from ship supply the water runs through a 15 micron filter, then into a six tank (70 gallons each) three level cascade system.

This system allows a 3 stage chilling process and insures warm seawater (top level) does not mix with the chilled seawater (bottom level) that you are using. Working in the tropics (surface water temp ~mid-20’s C) the van was set at 1C and the system maintained a chilled seawater supply of 4C without any issue. Upon opening the external valve, an internal pump maintains an 8ft pressure head, drawing from the internal tanks. Internal tanks have individual valves, can be shutoff and isolated if need be and internal hose can easily be rerouted (ie. If a single tank fails or you decide to store less water). There is

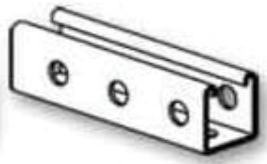


also an internal spigot for filtered, chilled seawater on the internal port side lab bench. The van itself has 4 drain holes allowing any internal leakage or spillage to drain.

Electrical: Internal electrical wiring is on a dedicated breaker box inside the cold van with two 20 amp breakers (port & stbd) and has a hardwired 'extension cord' that can be plugged into a standard 3-prong US AC external power outlet to provide internal power to the van. All internal outlets are weather grade boxes and internal lighting is lab grade. The refrigeration unit, a Carrier Thinline T-318, requires a standard 3 phase, 460 volts AC, 60 cycle, 60 amp power. Plug pictures and specifications are below



Internal UniStrut System: There are UniStrut channel brackets (size = 1-5/8" P1000H3) throughout the coldvan (floor-to-ceiling every 2 ft along the walls) for attaching and configuring benches and equipment. The van comes with spare mounting brackets and hardware stored in the attached red toolchest.



Safety Gear: All internal wood benches and shelves are marine grade Dricon CDX 3/4" fire retardant treated plywood. Flooring is an expanded steel grate with non-skid strips. The van has a single fire extinguisher, a first aid kit, an emergency battery powered lighting system and night-glow safety signs (i.e. exit, ladder, fire extinguisher, etc...) throughout.



SFI Cold Lab Van Design ver 6

