

APTD Advanced Products & Technology Development Inc.
50 de Belcaro, Blainville, Quebec, Canada, J7B 1P1

Introduction

APTD Advanced Products & Technology Development Inc. designs and builds custom valve/pipe boots for air separation units, and custom duct transition joints for turbine ducting. Our products are installed worldwide in new plant construction, and as upgrades of existing cold boxes.

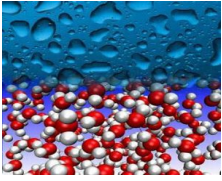
We deliver industry-leading performance, reliability, and fit. Contact us today to see how our custom engineered solutions can speed up installation, reduce downtime, and effectively eliminate costly maintenance/repair activities. APTD will evaluate your installation, find the best solution, and provide a quote.

Highlights

- Custom-designed CSPE boots with heavy-duty brass zipper and double zipper flaps.
- Install replacement boots in less than an hour without disassembling valve actuators.
- Fully-compatible with cold boxes from Praxair, Air Liquide, Air Products, Linde, Air Gas, Matheson and others.
- Our cryogenic service valve boot assemblies include all parts required for a complete cold box installation of any size.

Benefits

- Custom designed solution for each installation by an in-house engineer. Layout is done with CAD software to client's specifications.
- Pattern development uses a plotter to ensure a perfect fit, even when a valve extension or pipe is not concentric with the casing cut-out.
- All products are constructed out of synthetic rubber (CSPE), which is UV resistant and has an indefinite lifespan, even when exposed to cold box piping cryogenic frost conditions.
- Designed with split collars to enable size standardization of conical valve boot for different valve extension diameters.
- Integrated heavy-duty brass zipper, providing quick installation without the need to disassemble the valve actuator. Zippers have single or double flaps to prevent infiltration of precipitation.
- All boots have tag identification.
- Boots are designed to accommodate axial/lateral displacement that occurs when cold box piping cools down from atmospheric ambient temperatures.
- Transition joints are designed to accommodate axial/lateral displacement and vibration from fans or blowers and ASU turbine ducting.



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- Available individually, or as complete assembly kits including:
 - Fully stainless-steel band clamps including worm drive, 5/8 in. wide
 - Collars (if applicable) are bored to fit each valve extension and then split in two pieces. All collars have tag identification.
 - Carbon steel, stainless-steel, or aluminum cold box bulkhead ring (if one does not exist).
 - Permanently tacky synthetic thread reinforced butyl rubber sealant for the valve extension to aluminum collar joints and cold box casing to CBBR joints.
 - SS or CS hardware (Self-tapping screws or hex head nuts and bolts) to secure angle to cold box panel.

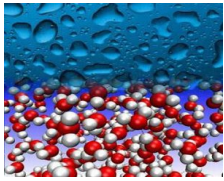
Target industries

- Custom air separation unit cold box valve and pipe boots for the air separation industry (producers of oxygen, nitrogen, argon, hydrogen)
- Replacement boots to upgrade cold boxes built by Praxair, Air Liquide, Air Products, Linde Air Gases, and others.
- Custom duct transition joints for the pulp and paper, sawmill, and air separation industries (smelters, wastewater treatment facilities, LNG plants, diesel refineries).

Installation examples

Boot to Cold Box Casing

- Valve and pipe boots are installed in the vertical orientation (cold box roof) or horizontal orientation (cold box wall)
- Cold box boots are designed for attachment to the cold box casing in one of two ways:
 - “Standard with Ring Collar Boot” (Figure 1) installed over ring penetration protruding from cold box casing, secured using SS band clamps over boot collar. (Ring penetration protruding from cold box casing is otherwise known as the cold box bulkhead ring)
 - “Witches Hat with Brim Boot” (Figure 3) clamped flush against cold box casing, secured using a flanged ring over the boot brim
- In situations where a standard conical boot is desirable, and the cold box casing does not have a cold box bulkhead ring, one can be made using rolled angle.
- For standard valve or pipe boot options, see appendix.
 - Figure 1 Standard with Ring Collar Boot with Valve Extension Split Collar
 - Figure 2 Standard with Ring Collar Boot w/o Valve Extension Split Collar
 - Figure 3 Witches Hat with Brim Boot with Valve Extension Split Collar
 - Figure 4 Witches Hat with Brim Boot w/o Valve Extension Split Collar



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Boot to Valve Extension

Two options are available:

- Band clamped directly to the valve extension outer diameter. See Figures 2, 4.
- Band clamped to an aluminum collar that is bored to suit the valve extension outer diameter. This permits boot sizing standardization. See Figures 1, 3.

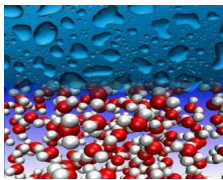
Specifications

Chlorosulfonated Polyethylene Synthetic (CSPE) Rubber Boots

Coated Fabric Properties	Test Method	Requirements
Material: CSPE/Nylon		
Adhesion	ASTM D751-89 Par. 43.1.2	Minimum of 10.00 lbs/in.
Colour	Visual	Light Grey
Colour Check	Manufacturer Test Method	Pass
Gauge	ASTM D751-89 Par. 9	Record Only
State of Cure	Manufacturer Test Method	Pass
Taber Abrasion	ASTM D3389-94, Method A	Pass
Tongue Tear - Fill	ASTM D751-89 Par. 29	Minimum of 40.00 lbs
Tongue Tear - Warp	ASTM D751-89 Par. 29	Minimum of 50.00 lbs
Weight	ASTM D751-89 Par. 10.2	35 Oz/yd ²
Width	ASTM D751-89 Par. 8	60 inches Untrimmed

Valve or Pipe Boot Options

Style	Configuration	Location	Valve Extension
Standard with Ring Collar Boot	Conical/Concentric	Casing Wall or Roof/Floor	With or without Split Collar
Standard with Ring Collar Boot	Conical/Eccentric	Casing Wall or Roof/Floor	With or without Split Collar
Witches Hat with Brim Boot	Conical/Concentric	Casing Wall or Roof/Floor	With or without Split Collar
Witches Hat with Brim Boot	Conical/Eccentric	Casing Wall or Roof/Floor	With or without Split Collar
Cylindrical	N/A	Casing Wall or Roof/Floor	N/A
Special Transition			



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Cold Box Casing Bulkhead Ring

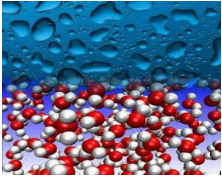
Ring Materials	Location	Remark
Carbon steel or stainless steel	Casing Wall or Roof/Floor	Standard supply for new cold boxes or upgraded cold boxes where welding is permitted
Carbon steel, stainless steel or aluminum angle Each angle is pre-drilled with pilot holes as a template for drilling cold box casing. Each 360 degree angle ring is supplied in 2 segments with sealant and bolting	Casing Wall or Roof/Floor	Required when "Standard with Ring Collar Boot" is to be used. Supply for cold box upgrades where welding is prohibited

Valve Extension Split Collars

Characteristics	Details
Standard Dimensions	Standard 3.0 in., 4.0 in., 6.0 in., 8 in. Outside Diameter x 1.5 in. Thick
Custom Sizes	Per special order
Standard Materials	Aluminum
Other Materials	Per special order, PTFE, Haysite™
Standard Features	Bored to suit the OD of the specific valve extension, thereafter collar is cut in half to facilitate installation without valve extension disassembly
Other Features	Per special order, collars are supplied with a 0.25 in. NPT tap c/w brass plug. Tap may be used as connection for N2 or steam purge supply

Joint Tape/Sealant

Specifications	Usage
Permanently Tacky, Synthetic Thread Reinforced Butyl Rubber Sealant,	Between Valve Extension Collar ID and Collar Segments Between Cold Box Casing and Casing Bulkhead Angle Ring
Width: 2 in. or 1 in.	
Application: By Hand	



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Origin of Materials

Component	Country
CSPE/Nylon Material	USA
Design, Manufacture of Boot	Canada
Cold Box Casing Bulkhead Ring (CCBR)	Canada
Valve Extension Split Collars	Canada
Joint Tape/Sealant	USA
SS Band Clamps	USA
Hardware for CCBR	Canada

Shipping

Expedited Delivery

Where possible shipments that can be done by courier are done so using UPS, FedEx, DHL or other as advised by the client.

Larger Shipments

Larger shipments within North America can be done using air but are more frequently done by truck. International shipments can also be done by air but are typically done by truck and ship.

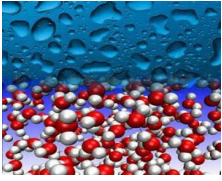
ISPM 15

Excluding destinations within North America, all international shipments made using wood packaging, pallets and crates comply with 'International Standards for Phytosanitary Measures' No. 15 (ISPM 15). That is, all wood is bark free and then heat treated or fumigated with methyl bromide

Lead time

Lead time includes the time needed to design the solution and fabricate all components. Lead time will be provided in the quote.

Generally, orders of 50 boot assemblies or less are usually shipped in 3 to 4 weeks. Large orders that include cold box casing bulkhead rings may require 8 weeks.



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Appendix

Valve or Pipe Boot Options

Figure 1: Standard with Ring Collar Boot with Valve Extension Split Collar

Figure 2: Standard with Ring Collar Boot w/o Valve Extension Split Collar

Fig. 1

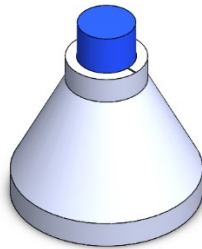


Fig. 2

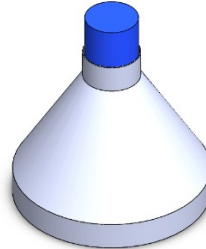


Figure 3: Witches Hat with Brim Boot with Valve Extension Split Collar

Figure 4: Witches Hat with Brim Boot w/o Valve Extension Split Collar

Fig. 3

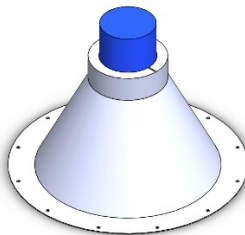


Fig. 4

