



ENCLOSURE AND FINISH CLASSES SCREW CONVEYORS FOR BULK MATERIALS EXCERPT FROM #350

Screw Conveyors for Bulk Materials - Book No. 350

CLASSES OF ENCLOSURES

General

The terms "dust-tight," "semi-dust-tight," "commercially dust-tight," "weather-proof," are used in specifications relating to conveyor enclosure. These are extremely broad terms and subject to many interpretations depending on individual conception and experience. It is difficult, if not impractical to attempt to define these terms by their degree of effectiveness. Enclosure of conveyors beyond that which is necessary for the conveying function can be designed to protect most material being handled from a hazardous surrounding or to protect most surroundings from a hazardous material being conveyed.

Recognizing these facts, this section establishes CEMA recommended classes of construction for conveyor enclosures—without regard to their end use or application. These several classes call for specific things to be done to a standard conveyor housing to provide several degrees of enclosure protection and will eliminate the general terms listed previously.

It is recognized that other types of enclosures are sometimes practical and that additional design features can be incorporated as dictated by specific job requirements. They are too numerous and too special to be included here.

CEMA Enclosure Classifications

- Class IE — Class IE enclosures are those provided primarily for the protection of operating personnel or equipment, or where the enclosure forms an integral or functional part of the conveyor or structure. They are generally used where dust control is not a factor or where protection for, or against, the material being handled is not necessary—although as conveyor enclosures, a certain amount of protection is afforded.

- Class IIE — Class IIE enclosures employ construction which provides some measure of protection against dust, or for or against the material being handled.

- Class IIIE — Class IIIE enclosures employ construction which provides a higher degree of protection in these classes against dust, and for or against the material being handled.

- Class IVE — Class IVE enclosures are for outdoor applications and under normal circumstances, provide for the exclusion of water from the inside of the casing. They are not to be construed as being watertight, as this may not always be the case.

When more than one method of fabrication is shown, either is acceptable.

**Table 5-2
Enclosure Construction**

COMPONENT CLASSIFICATION	ENCLOSURE CLASSIFICATIONS			
	IE	IIE	IIIE	IVE
A. TROUGH CONSTRUCTION Formed & Angle Top Flange 1. Plate type end flange a. Continuous arc weld b. Continuous arc weld on top of end flange and trough top rail 2. Trough Top Rail Angles (Angle Top Trough only) a. Staggered intermittent arc and spot weld b. Continuous arc weld on top leg of angle on inside of trough and intermittent arc weld on lower leg of angle to outside of trough c. Staggered intermittent arc weld on top leg of angle on inside of trough and intermittent arc weld on lower leg of angle to outside of trough, or spot weld when mastic is used between leg of angle and trough sheet				
	X	X	X	X
	X	X	X	X
	X			
		X	X	X
		X	X	X
B. COVER CONSTRUCTION 1. Plain flat a. Only butted when hanger is at cover joint b. Lapped when hanger is not at cover joint 2. Semi-Flanged a. Only butted when hanger is at cover joint b. Lapped when hanger is not at cover joint c. With buttstrap when hanger is not at cover joint 3. Flanged a. Only butted when hanger is at cover joint b. Buttstrap when hanger is not at cover joint 4. Hip Roof a. Ends with a buttstrap connection				
	X			
	X			
	X	X	X	X
	X	X	X	X
		X	X	X
		X	X	X
				X
C. COVER FASTENERS FOR STANDARD GA. COVERS 1. Spring, screw or toggle clamp fasteners or bolted construction * a. Max. spacing plain flat covers b. Max. spacing semi-flanged covers c. Max. spacing flanged and hip-roof covers *For bolted construction use: 1/4" bolts—4"-10" dia. screws—(min. dia.) 5/16" bolts—larger dia. screws—(min. dia.)				
	60"			
	60"	30"	18"	18"
		40"	24"	24"
D. GASKETS 1. Covers a. Red rubber or felt up to 230°F b. Neoprene rubber, when contamination is a problem c. Closed cell foam type elastic material to suit temperature rating of gasket 2. Trough End flanges a. Mastic type compounds b. Red rubber up to 230°F c. Neoprene rubber, when contamination is a problem d. Closed cell foam type elastic material to suit temperature rating of gasket				
		X	X	
		X	X	X
		X	X	X
		X	X	X
		X	X	X
		X	X	X
		X	X	X
E. TROUGH END SHAFT SEALS* 1. When handling nonabrasive materials 2. When handling abrasive materials *Lip type seals for nonabrasive materials Felt type for mildly abrasive materials Waste type for highly abrasive materials				
	X	X	X	X
	X	X	X	X
F. DUST COLLECTING SYSTEMS 1. Provisions should be made for connecting to external dust collecting systems				
			X	

SPECIAL SCREW CONVEYOR CONTINUOUS WELD FINISHES[†]

Specifications on screw conveyors occasionally include the term “grind smooth” when referring to the finish on continuous welds. This specification is usually used for stainless steel, but occasionally it will appear in carbon steel specifications as well.

“Grind smooth” is a general term and subject to various interpretations. This section establishes CEMA recommended classes of finishes, which should be used to help you find the class required for an application.

Operation	Class of Finish				
	I	II	III	IV	V
Weld spatter and slag removed	X	X	X	X	X
Rough grind welds to remove heavy weld ripple or unusual roughness (Equivalent to a 40-50 grit finish)		X			
Medium grind welds—leaving some pits and crevices (Equivalent to a 80-100 grit finish)			X		
Fine grind welds—no pits or crevices permissible (Equivalent to a 140-150 grit finish)				X	X
Polish to a bright uniform finish					X

Class I finish has the weld spatter and slag removed, but no grinding of the welds.

Class II finish is a refinement of the “as welded condition” with the welds rough ground to remove heavy weld ripple or unusual roughness.

Class III finish has the welds medium ground with some pits and crevices permitted. This finish is recommended for materials which do not tend to contaminate or hang up in pits or crevices.

Class IV & V finishes have the welds ground fine with no pits or crevices. The only difference between the two finishes is the degree of polish. These finishes are recommended where sanitary regulations dictate exclusion of the materials being handled from the welded surface. The type of finish is dependent on the application and/or industry.

[†]Special weld finishes do not apply to standard stock conveyor screws.

SPECIAL FEATURES AND MODIFICATIONS

The following descriptions cover the most commonly used special features available for equipping screw conveyors to perform various functions in conveying systems. When added to the many available standard constructions, these special features greatly broaden the range of usefulness of screw conveyors. While standard components are more desirable and practical in the design of a screw conveyor system, the inclusion of one or more of the following special features may result in a more compact or efficient overall arrangement.