



<b>Title:</b>	<b>CORE Liner® Compliance to ASME B31.4</b>	 <b>CORE LINEPIPE</b>
<b>Document and Rev #:</b>	CLP-TB-014r0	
<b>Document Owner:</b>	Applications Engineering	
<b>Revision Date:</b>	17-Sep-2019	

## CORE Liner® Compliance to ASME B31.4

The below table highlights the compliance of CORE Liner® with the main requirements of ASME B31.4-2016 Pipeline Transportation Systems for Liquids and Slurries.

#	Para.	Requirement	CORE Liner	Status
1	403.1	External or internal coatings or linings of cement, plastics, or other materials may be used on steel pipe conforming to the requirements of this Code.	HDPE internal lining is used.	Complied.
2	403.2.1	Select the wall thickness based on the nominal wall thickness, use a weld joint factor E=1 for ERW pipe, use a maximum design factor F=0.72.	Ditto.	Complied.
3	404.1.3	Piping components not having established pressure ratings may be qualified for use as specified in paras. 404.10 and 423.1(b).	-	-
4	404.10	Pressure-containing components that are not covered by the standards listed in Table 423.1-1 or Table 426.1-1 and for which design equations or procedures are not given herein may be used where the design of similarly shaped, proportioned, and sized components has been proven satisfactory by successful performance under comparable service conditions.	CORE Liner has been successfully used in more than 100 projects using more than 175 miles of pipe during the past 5 years. In addition, the CORE Liner design is based on detailed finite element analysis and has successfully passed a rigorous qualification testing program.	Complied.
5	423.1.(b)	Materials that do not conform to a listed specification or standard in Table 423.1-1 may be used provided they conform to a published specification covering chemistry, physical and mechanical properties, method and process of manufacture, heat treatment, and quality control, and otherwise meet the requirements of this Code.	CORE Liner complies with the requirements of CSA Z245.1 Steel Pipe.	Complied.
6	404.2.2	Minimum radius of field cold bends is 18xD for size 12" and below.	CORE Liner uses a minimum bend radius of 20xD.	Complied.
7	404.4.1	The design of flanges manufactured in accordance with para. 404.4 and standards listed in Table 426.1-1 shall be considered suitable for use at the pressure-temperature ratings as set forth in para. 404.1.2.	CORE Linepipe uses ASME B16.5 flanges and ratings.	Complied.
8	404.8.4	Sleeve, coupled, and other patented joints may be used provided (a) a production joint has been subject to proof tests to determine the safety of the joints under simulated service conditions.	CORE Liner uses a patented mechanical interference fit joining system. CORE Liner, including the joints, successfully passed rigorous qualification testing simulating	Complied.

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		(b) adequate provisions are made to prevent separation of the joint and to prevent longitudinal or lateral movement beyond the limits provided for in the joining member.	anticipated service conditions. CORE Liner is a tensile resistant pipe system that does not need external anchoring to resist axial pull forces.	
9	423.1(a)	The materials used shall conform to the specifications listed in Table 423.1-1 or shall meet the requirements of this Code for materials not listed.	CORE Liner uses the following: API 5L X52 for the pipes. ASME B16.5 for the flanges. MSS SP-97 for the thread-o-lets.	Complied.
10	423.2.3	Steel pipe designed to be operated at a hoop stress of more than 20% Sy shall be impact tested in accordance with the procedures of API 5L, PSL 2, or ASTM A333. At 32°F (0°C) or the lowest service temp. For SMYS >289 MPa, Full size specimen transverse 27J (Average)	CORE Liner uses a minimum average transverse notch toughness of 27J at -49°F as per CSA Z245.1.	Complied.
11	434.8.3	Welder and Welding Procedure Qualifications: shop-fabricated piping assemblies, shall be performed in accordance with API 1104 or Section IX of the ASME Boiler and Pressure Vessel Code.	CORE Liner welders and welds are qualified per ASME section IX.	Complied.
12	434.8.5	A minimum of 10% of the girth welds and 10% of the other welds completed each day shall be randomly selected by the operating company and non-destructively inspected. The inspection of girth welds shall be by radiographic or other accepted volumetric methods. Nonvolumetric methods, such as dye penetrant or magnetic particle, may be used for other welds.	100% of the CORE Liner girth welds are tested by radiography. 100% of CORE Liner thread-o-let welds are tested by MPI.	Confirmed.
13	437.4.1	For pipes with a stress above 0.2xSMYS, a hydrostatic proof test equivalent to not less than 1.25 times the internal design pressure at that point (see para. 401.2.2) for not less than 4 hr. On those portions of piping systems not visually inspected while under test, the proof test shall be followed by a reduced pressure leak test equivalent to not less than 1.1 times the internal design pressure for not less than 4 hr.	So far, CORE Linepipe recommended a field proof hydrotest at 1.25 x design pressure for 4 hrs, followed by a leak test at 290 psi for 4 hrs, as per CSA Z662. The 290 psi is selected based on an understanding that this pressure is the optimal pressure to allow any water that leaked through the liner to travel along the annular space and be detected at the thread-o-let vent hole. There is no concern with performing the leak test at 1.1 x design pressure for 4 hrs as described in ASME B31.4	Complied.