

QWIK GUIDE:

ISO-C1[®] CINI COMPLIANCE FOR LNG FACILITIES

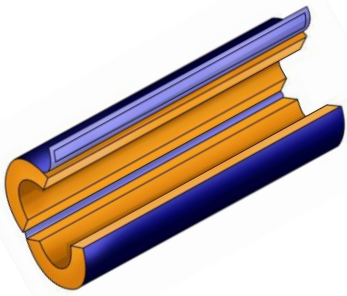
BACKGROUND:

Throughout the World, the standard of CINI (Committee INDUSTRIAL Insulation) has become the International Standard for Industrial Insulation, used when thermal insulation work needs to be engineered and installed. CINI has been established as the standardization institute for insulation in the field of the petro/chemical industry, process industry, power plants, LNG terminals etc. Dyplast Products has completed the rigorous testing of its ISO-C1/2.5 (2.5 lb/ft³ or 40 kg/m³), and meets or exceeds the CINI requirements. This Qwik Guide continues as demonstrable proof of Dyplast's policy of full disclosure and prompt compliance, and superior product physical properties independently tested by competent authority.

CINI Compliance Results

CINI is the dominant international standard governing insulation in Liquid Natural Gas (LNG) facilities. Dyplast's ISO-C1/2.5 (2.5 lb/ft³) meets or exceeds the requirements of this most demanding standard.

ISO-C1 [®] /2.5 (40 kg/m ³)							
	Units	CINI Standard			ISO-C1 [®] /2.5		
4 Material Properties			Value		Value		
4.2 Nominal Density - ASTM D1622	kg/m ³		40		40.3		
4.3 Apparent Thermal Conductivity (aged 6 months @ 23 + or - 2°C) -ASTM C177	W/m.°K	CINI Temperature	CINI Standard	Test Temperature	Dyplast Value		
				-170°C	0.016	-165°C	0.012
				-150°C	0.017	-129°C	0.017
				-100°C	0.022	-100°C	0.02
						-73°C	0.023
				-50°C	0.026	-45°C	0.026
						-17°C	0.027
				0°C	0.029	not tested	
				10°C	0.029	10°C	0.026
						24°C	0.028
		50°C	0.033	66°C	0.033		
		100°C	0.03	93°C	0.037		
4.4 Closed Cell Content - ASTM D6226	% minimum		≥95		95		
4.5 Water Absorption - C272	% by volume		≤2.0		0.27		
4.6 Water Vapor Permeability	ng(Pa·s·m)		≤5.5		2.8		
- ASTM E96 (Procedure A)							
5 Mechanical Properties							



5.1 Compressive Strength	kPa				
-ASTM D1621 at -165°C		All directions	280		
Parallel					495
Perpendicular					360
at 23°C		All directions	200		
Parallel					295
Perpendicular					220
5.2 Linear Thermal Expansion Coefficient					
- ASTM E228 from -165 to 23 °C		average	$\leq 70 \times 10^{-6}$	average	59×10^{-6}
5.3 Tensile Strength	kPa				
- ASTM D1623 at -165°C		All Directions	200		
Parallel					484
Perpendicular					279
at 23°C			300		
Parallel					410
Perpendicular					335
5.4 E Modulus (all directions)	MPa				
- ASTM D1623 at -165°C			≤ 16		
Parallel					4.09
Perpendicular					3.07
5.5 Poisson's Ratio					
-165°C			0.4		0.4
5.6 Cryogenic Thermal Stress Resistance	Calculated		≥ 1.5		5.8
6 Chemical Properties					
6.1 Leachable Chloride - ASTM C871	mg/kg		≤ 60		≤ 60
6.2 pH - ASTM C871			5.5 - 7.0		6.9
7 Combustibility					
7.1 Flame Spread Index - ASTM E84			≤ 25		≤ 25