ConduFill® (HT-450) Technical Data Sheet

ConduFill® (HT-450) is a closed-cell polyisocyanurate foam insulation that provides exceptional insulating value for buried underground steam and hot water piping systems at continuous operating temperatures up to 400° F (202° C), with intermittent service to 450°F (230° C). In contrast to open-cell foam, ConduFill® is inherently resistant to the ingress and spread of water by virtue of its molecular structure which closes the pathway between adjacent foam cells.

Once injected into an underground piping system, ConduFill® will expand 30 times its own volume and will completely fill the void between the carrier pipe and the outer casing. The presence of new insulation will significantly reduce heat losses and prevent ground water from entering the piping system. ConduFill® offers operators improved energy conservation due to increased insulating efficiency, better process controls and yields, while providing upgrades in strength, durability, stability and moisture resistance.

PHYSICAL PROPERTIES

Property	ASTM Test Method	Result
Density	D-1622	2.45 (38.5)
Compressive Strength, psi (kPa) at 10% Deflection Parallel to Rise Perpendicular to Rise	D-1621	 30 (207) 27 (186)
Compressive Strength after 28 day exposure to 400°F (202°C), psi (kPa) Parallel to Rise Perpendicular to Rise		 17.5 (120) 16.0 (110)
Closed Cell Content, %	D-2856	87
K-Factor, BTU-in/hr/ft^2 °F (W/mK) Aged 180 Days @ 75°F (25°C) Aged 90 Days @ 140°F (60°C)	C-518	0.13 (0.018) 0.165 (0.022) 0.18 (0.026)
Water Absorption, psf (g/cm^2) % by volume	 D-2842	0.035 (0.017) < 2
Dimensional Stability, % Change **Dry Heat, 400°F (202°C)** 1 Day 7 Days 28 Days **Dry Heat, 450°F (230°C)** 1 Day 7 Days 28 Days **Dry Cold, -30°F (-34°C)**	 **Length** +1.3 +2.3 +1.6 +10.3 +7.1 +1.9	 **Volume** +0.1 -2.3 -4.4 +14.6 +1.5 -11.9

1 Day 7 Days **Humid Age, 158°F (70°C), 95% Relative Humidity** 1 Day 7 Days 28 Days	0 0 +1.0 +1.52 +2.02	0 0 +0.84 +1.85 +1.85
Service Temperature Continuous Intermittent	-100°F (-73° C) to +400°F (202° C) To 450° F (230° C)	
Surface Burning Characteristics Flame Spread, 1” Smoke Developed	40 80 The numerical flame spread and smoke developed data shown above is not intended to reflect fire hazards presented under actual fire conditions	

The physical properties shown above were obtained by processing the chemicals through a conventional low pressure high shear mixing machine. Chemical temperatures were maintained at 90° F (32° C) for the isocyanate component and 80° F (27° C) for the polyol. Box pours measuring 24" x 24" x 24" (61cm x 61 cm x 61 cm) were made and the resulting foam was cured for 30 days at room temperature, approximately 77° F (25° C). Testing was done on core samples cut from the box pour.

CHEMICAL PROPERTIES

Property	Component A	Component B	Component C
Viscosity, cps @ 77°F (25°C)	600-800	750-1000	275-450
Specific Gravity, cps @ 77°F (25°C)	1.24	1.24	1.24
Ratio, parts by Weight	67	16.5	16.5
Reaction Profile	200 gm Lab Hand Mix With 3000 rpm Mixer Start of Rise: 15-45 seconds String Gel: 60-150 seconds Rise Time: 90-240 seconds Free Rise Density: 2.1 – 2.3 pcf (33.7 – 37 kg/m^3)		