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Technical Hotline

StoVentec® Fiber Cement Impact Resistance Study
No. 101-SVFC
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StoVentec® Fiber Cement

StoVentec Fiber Cement is an open joint drained and back-ventilated rainscreen wall system from a single source that combines superior air and weather tightness with excellent thermal performance and fire protection. It incorporates noncombustible continuous exterior insulation and a continuous air and water-resistant barrier with StoVentro™ Sub-construction and StoVentec Fiber Cement Panels to produce an advanced high performance wall assembly.



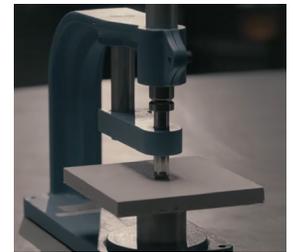
StoVentec Fiber Cement - Impact Resistance Study

Sto Corp. commissioned extensive impact resistance testing for StoVentec Fiber Cement materials and assemblies. StoVentec Fiber Cement panels are a high density, non-combustible cladding material compliant with ASTM C1186 Type A, Grade IV. Panels are available in 8mm and 10mm thicknesses. Neither the International Building Code and International Residential Code models, nor the fiber cement standard, ASTM C1185, contain any impact resistance requirements or criteria for fiber cement claddings. In the absence of a product-specific standard, this study utilized ASTM C1629, Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels, as the benchmark standard and was inclusive of testing for indentation of the material alone, as well as installed condition hard and soft body impact resistance. The goal was to provide data on the materials' durability against everyday wear and tear scenarios separate from severe cases such as hurricane missile impacts. Refer to StoVentec's Florida Product Approvals and/or Miami-Dade Notices of Acceptance for system hurricane rating information.

Included in the scope of ASTM C1629 are tests for **surface indentation** (Gardner Impact), small **hard body** impacts, and large **soft body** impacts.

Indentation

Utilizing a falling weight striker impact test device per ASTM D5420 and an impact energy of 72 in-lb, three samples of each variety of StoVentec Fiber Cement were tested for indentation resistance. Results in each case meet the Class 2 requirement per ASTM C1629 of ≤ 0.100 inches (2.54mm).

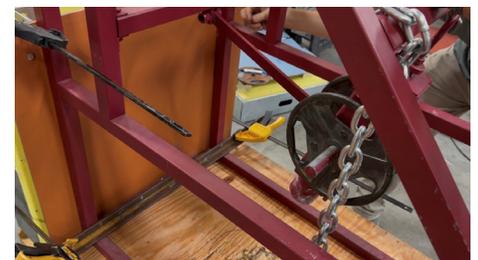


Indentation resistance test apparatus.

Material and Thickness	Result - indentation depth (in.) (average)
8mm Primara/Mezzo Lines	0.077 (1.96mm)
10mm Primara/Mezzo Lines	0.062 (1.87mm)
8mm Strata Line	0.093 (2.36mm)
10mm Strata Line	0.056 (1.42mm)

Small, Hard Body

Utilizing a metal falling/swinging weight striker (20lbs min.) with a 2.75 in. (70mm) diameter impactor flat surface, three samples of each variety of StoVentec Fiber Cement were tested for small, hard body impact resistance. Each test assembly, representative of real-world installed conditions for fiber cement, utilized StoVentec Brackets and L-Profiles with visible fixing of the panels. Test assemblies utilized 16 inch and 24 inch on center material spans.



Small, hard body impact resistance test setup with installed fiber cement on representative wall assembly.

Material and Thickness	Span (in.)	Result - Impact Energy in ft-lb _f at Panel Fracture averages
8mm Primara/Mezzo Lines	16	23 (32 Joules)
10mm Primara/Mezzo Lines	16	28 (37 Joules)
8mm Strata Line	16	20 (27 Joules)
10mm Strata Line	16	20 (27 Joules)
8mm Primara/Mezzo Lines	24	18 (24 Joules)
10mm Primara/Mezzo Lines	24	25 (34 Joules)
8mm Strata Line	24	19 (26 Joules)
10mm Strata Line	24	15 (20 Joules)



Large, Soft Body

Utilizing a falling/swinging 60lb (27.2kg) prescribed leather bag containing lead shot, each variety of StoVentec Fiber Cement panels were tested for large, soft body impact resistance. Each test assembly, representative of real-world installed conditions for fiber cement with full-sized panels, utilized StoVentro Sub-construction (Brackets and L-Profiles) with visible fixing of the panels. Test assemblies consisted of 16 inch and 24 inch on center material spans. The impact energy limit measured for **Retention of Performance** represents the impact level at which an installed panel shows initial evidence of slight surface cracking. The **Safety Impact** result gives the impact energy at which panels fully fracture and require immediate replacement.



Large, soft body impact resistance test setup with installed fiber cement on representative wall assembly.

Material and Thickness	Span (in.)	Result - Impact Energy in ft-lb _f for Retention of Performance averages	Result - Impact Energy in ft-lb _f for Safety Impact averages
8mm Primara/Mezzo Lines	16	90 (122 Joules)	120 (163 Joules)
10mm Primara/Mezzo Lines	16	117 (158 Joules)	140 (190 Joules)
8mm Strata Line	16	53 (72 Joules)	87 (118 Joules)
10mm Strata Line	16	67 (90 Joules)	90 (122 Joules)
8mm Primara/Mezzo Lines	24	70 (95 Joules)	93 (127 Joules)
10mm Primara/Mezzo Lines	24	100 (136 Joules)	120 (163 Joules)
8mm Strata Line	24	50 (68 Joules)	70 (95 Joules)
10mm Strata Line	24	63 (86 Joules)	73 (99 Joules)

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