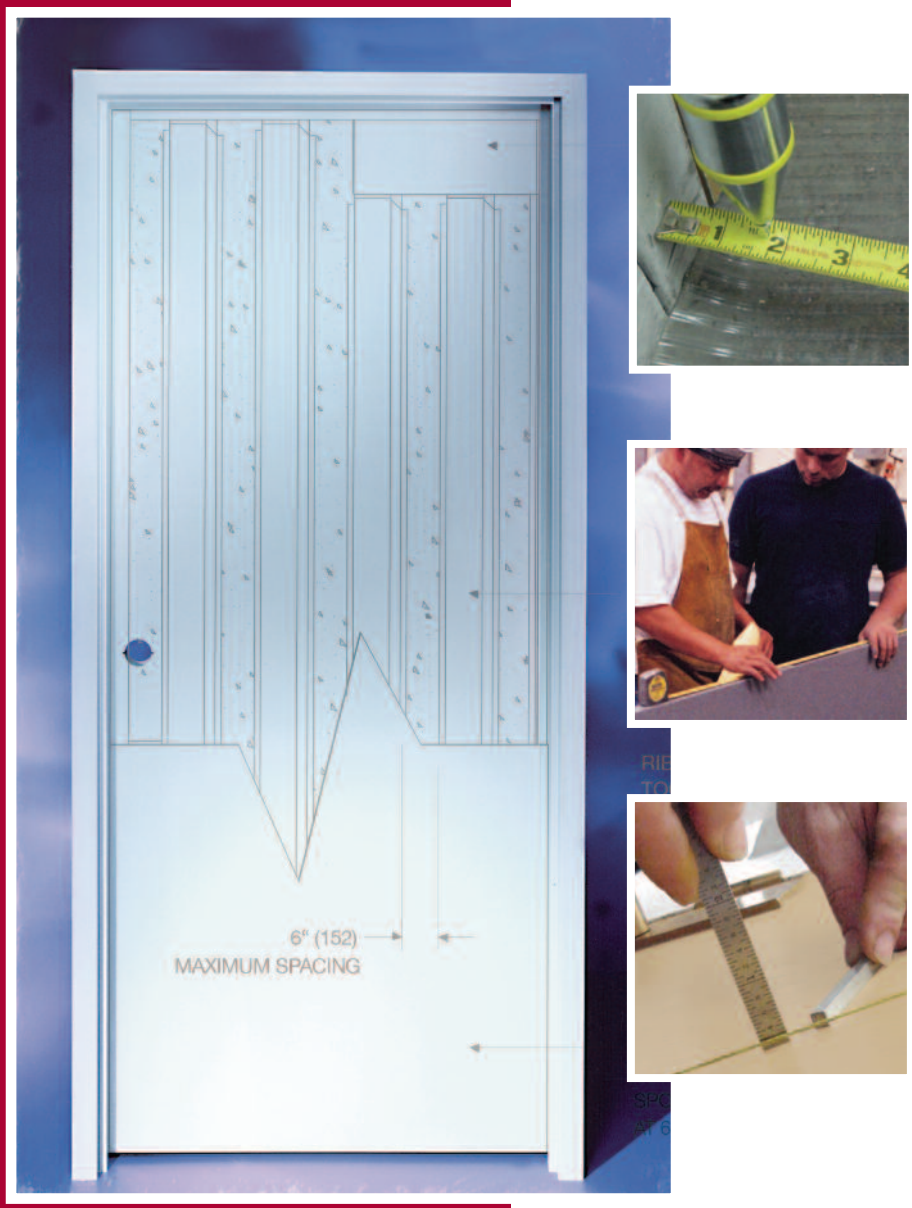
CURRIES

ASSA ABLOY



Engineering Specifications

ASSA ABLOY, the global leader in door opening solutions

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General Information

General:

The Engineering Specification Sheets have been developed to provide a technical description of CURRIES' products. Every effort has been made to insure the accuracy of the information. CURRIES Company reserves the right to revise these specifications without notification as new tests are conducted, tests or specifications are revised, and as new products are introduced.

Please contact the CURRIES Customer Service Department if any errors, omissions, or questions are identified.

NOTE: Information included in this data sheet is proprietary to CURRIES Company and subject to revision without notification.

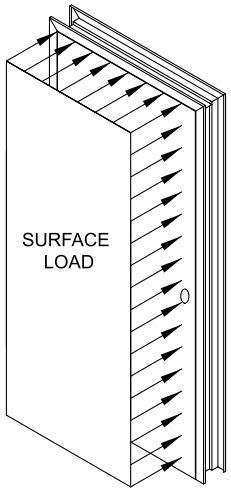
707 Door Series Physical Performance

Surface Load Test

Pressure was applied across a 707 series door installed in a test frame and deflection was recorded to determine maximum surface load achieved.

Surface Load (lb/ft2)	Bottom Door Deflection (in)	Center Door Deflection (in)
720	0.005	0.050
1,440	0.250	1.406
1,585	0.269	1.406
1,730*	0.288	1.406
2,300	--	--

* 2300 lb/ft2 was achieved but could not be sustained long enough for deflection reading.

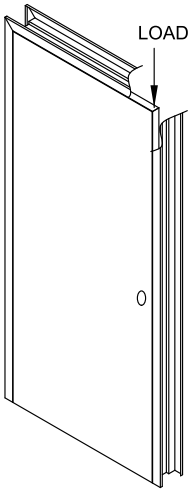


Sag Test

A downward force was applied at the lock edge top corner of a 707 series door installed in a test frame. Deflection was recorded between frame and top hinge location to determine maximum corner loading prior to hinge reinforcement failure.

Load (lb)	Deflection (in)
1,000	0.05
1,600	0.12
2,200	0.23
3,000	0.5
3,400	0.7
4,000*	1.02

* Top hinge screw threads stripped out after approximately 1 minute at load.



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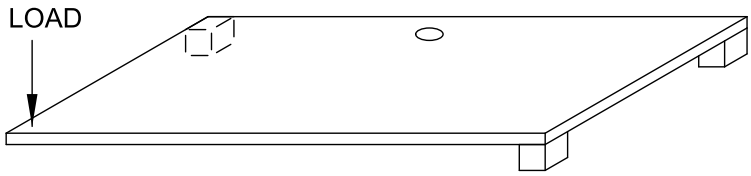
707 Door Series Physical Performance

Racking Twist Test

Three corners of a 707 series door were supported and a load was applied to the unsupported corner. Deflection was measured to determine maximum rack load achieved.

Load (lb)	Deflection (in)
200	0.25
550	0.75
650	0.95
700	1.05
900	1.75
1050*	2.8



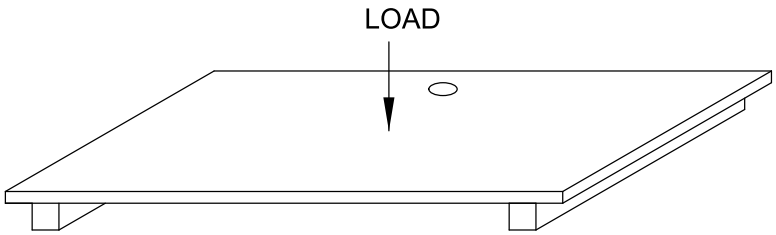
* Maximum sustainable load, 1.95" permanent deflection.

Beam Test

The ends of a 707 series door were supported across the width and a load was applied in the center. Deflection was measured to determine maximum load achieved.

Load (lb)	Deflection (in)
500	0.111
700	0.156
1,000	0.228
1,500	0.342
2,000*	0.489

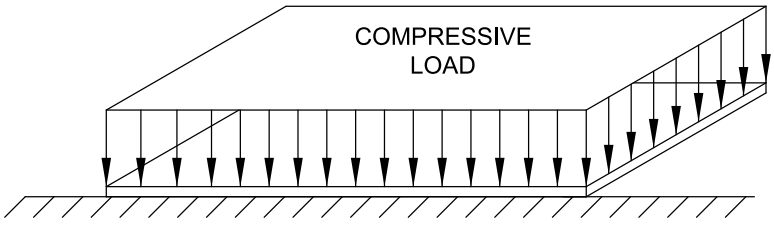
* Maximum sustainable load



Compression Load Test

A 707 series door samples was compressed to determine deflection achieved at varying compressive loads.

Compressive Load (lb)	Deflection (in)
30,000	0.16
35,000	0.51
55,000	0.91
75,000	1.3
100,000	1.46



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Channel Reinforcing Performance Characteristics

Channel vs. Plate Reinforcing Section Properties Comparison

A comparison of the section properties (tension, compression, and flexure) of channel type (3/4" x 1.625") and flat bar (1-1/4") reinforcing was performed. The u-channel reinforcing used in CURRIES' hollow metal doors exhibits superior properties to that of the flat bar reinforcing.

Channel vs. Plate	% Increase in Compression and Yielding Tension	% Increase in in Fracture Tension	% Increase in Flexure (Perpendicular)	% Increase in Flexure (Parallel)
14 ga. vs. 10 ga.	32	36	2,100	395
12 ga. vs. 7 ga.	38	41	1,550	407

Hinge Channel Reinforcing #12-24 Thread Pullout Strength

Screw pullout testing has been performed on CURRIES' 12 and 14 gauge channel with extruded hole, 12 and 7 gauge flat, and 14 gauge flat double thickness to determine relative thread strength.

Sample	Results* (lb)	Observations
12 gauge channel with extruded hole	1,840	Fastener pulled apart, screw still operable in sample
12 gauge flat	1,240	Thread stripped off end of fastener
7 gauge flat	1,910	Fastener pulled apart, screw still operable in sample
14 gauge channel with extruded hole	1,250	Channel distorted before threads failed
14 gauge flat double thickness	1,320	Material distorted and thread failed

*Average of three samples tested.

The 14 gauge channel's extruded hole threads are stronger than the parent metal or the fastener. The results listed are for a single screw hole. A hinge that is mounted to a 14 gauge hinge channel has a combined strength of 5000 lbs ((1,250lbs/screw)*(4 screws/hinge)).

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Steel Specifications

ASTM Steel Specifications

CURRIES manufactures products from steel meeting applicable ASTM specifications that are listed in ANSI A250.8. Cold rolled, hot rolled, galvanized, galvannealed, and stainless steel products are summarized in the table below:

CURRIES' Product Uses	Material Gauge	Steel Type	ASTM Designation
Doors and Reinforcements	20, 18, 16, 14, 12	Cold Rolled	A1008/A1008M
Frames	18, 16, 14, 12		A568/A568M
E1 Coverbox w/Integral Tabs	16		A1008/A1008M
Reinforcing	11, 7	Hot Rolled	A568/A568M
Door Hinge/Lock Channels	14, 12, 10		A1011/A1011M
Doors	20, 18, 16, 14,	Galvanized	A653/A653M
Frames	16, 14,12	G90	
Doors	20, 18, 16, 14,	Galvannealed	A653/A653M
Frames	18, 16, 14, 12	A60	A924/A924M
Snap-In Top Caps	24		
Doors	20, 18, 16	Stainless Steel	A480/A480M
Frames	18, 16, 14	#304	

A480/A480M Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip.
A568/A568M Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled Sheet, General Requirements for
A653/A653M Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot Dip Process.
A924/A924M Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
A1008/A1008M Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
A1011/A1011M Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low Alloy with Improved Formability.

Types of Zinc-Coating

Zinc-coated steel doors and frames are fabricated from steel that has been zinc-coated by the "Hotdip" process. This process consists of submerging the steel in a bath of molten zinc. As the steel emerges various means are used to level and control the thickness of the zinc-coating to achieve a specific coating weight.

The zinc-coating produced from this method consists of an iron-zinc alloy layer with spangles of free zinc sitting on the surface. This type of coating is referred to with a G designation. If the steel is subjected to an additional annealing (heat treating) step the result is a completely alloyed iron-zinc coating referred to with an A designation. Both the A and G designations are a hot-dipped galvanized coating.

Coating Designations

Coating designations are written to represent the coating type, either G or A, and the coating weight. The coating weight is the amount of zinc on the steel surface and is expressed to represent the ounces per square foot of zinc as the total weight on both surfaces of the steel sheet.

Although sometimes specified, the zinc-coating designation G90 or greater is not recommended for door and frame construction. In addition to the limited availability of this material, the heavier coating causes problems in the fabrication process during forming, welding, and painting operations.

Minimum Coating Weights

In a coating weight of 40 there is an average of 0.4 ounces of zinc per square foot of steel, in 60 there is an average of 0.6 ounces of zinc per square foot of steel, and in 90 there is an average of 0.9 ounces of zinc per square foot of steel.

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Steel Specifications

Average Coating Thickness

The average coating thickness can be estimated from the minimum coating weight specified in the table by using a conversion factor. One ounce of zinc coating per square foot of surface equals an average coating thickness of 0.0017 in. (0.043 mm).

This coating thickness is not significant enough to make an appreciable difference in the measurable thickness of coated or uncoated steel of the same gage. Refer to the following table showing the coating designations, minimum coating weights, and average coating thickness.

The G type coatings have a free zinc spangled surface and may be processed to minimize the size of the spangle resulting in a smooth dull gray appearance. The A type coating has the zinc completely alloyed with the steel sheet and results in a dull gray surface with no spangles that is ready for painting after normal cleaning without further treatment.

Corrosion resistance is directly proportional to coating weight. The heavier the coating weight the more zinc is present and the more corrosion protection it will provide. Therefore, under normal atmospheric conditions a 60 designation will provide 50% more corrosion protection than the 40 designation coating.

Type	Coating Designation	Min. Requirement Triple-Spot Test, ($oz./ft^2$)	Min. Requirement Single-Spot Test, ($oz./ft.^2$)	Coating Designation	Min Requirement Triple-Spot Test, (g/m^2)	Min. Requirement Single Spot Test, (g/m^2)
Regular (Galvanized)	G90[A] G60	0.90 0.60	0.80 0.50	Z275[A] Z180	275 180	235 150
Alloyed (Galvannealed)	A60 A40	0.60 0.40	0.50 0.30	ZF180 ZF120	180 120	150 90

[A]CURRIES' Galvanized product

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Thermal Performance

Thermal Transmission Terms

The following terms are used in describing thermal properties of building products:

BTU - The BTU (British Thermal Unit) is the amount of heat needed to raise the temperature of one pound of water one degree Fahrenheit. The BTU is used to measure the amount of heat just as the inch or foot is used to measure length.

K-Factor - The measure of thermal conductivity or amount of heat transferred (measured in BTU's) in one hour through one square foot of a single material which is one inch thick for a difference of one degree Fahrenheit between the two surfaces. THE LOWER THE "K" FACTOR, the more effective the insulation of the material.

U-Factor - The total or overall transmission of heat through a combination of materials assembly measured in BTU's per hour per square foot of area for a difference in temperature of 1 °F between the air on one side to the air on the other side. THE LOWER THE "U" VALUE, the more effective the insulation of the material.

R-Factor - The resistance or ability to retard heat flow (as opposed to ability to transmit heat) of any single material determined by the reciprocal of its conductivity. R=1/U or t/K, where t is the thickness of the material involved. THE GREATER THE "R" FACTOR (or resistance), the more effective the insulation of the material.

All "K" and "U" factor values are expressed in BTU's/hr-ft^2-°F (W/m^2-°K). Materials possessing low "K" and "U" factor values are more efficient insulators than those with higher values.

Helpful conversion factors:

$$\text{"R"} = \frac{1}{\text{"U"}} = \frac{t}{\text{"K"}}$$ (where t is the material thickness in inches and the products are of uniform composition)

$$\text{"U"} = \frac{1}{R1+R2+...+etc.}$$ (Rx is for each material layer)

Energy Efficient Solutions

Similar to most other building products manufacturers, the Steel Door Institute has encouraged the practice of citing a calculated value for thermal performance of the cores in the doors (U and R Values). While this remains the industry standard, we are seeing more specs with the latest standards for thermal transmittance (ASTM C1363) and air infiltration (ASTM E283). Note, ASTM C1363 is the most current test standard for thermal transmittance and replaces ASTM C236.

You will see significant differences between the calculated core values (ASTM C518) and the operable door assembly values as door and frame construction varies. Design professionals are beginning to see these variances in other building products such as wall partitions (an industry that has already begun to move from calculated to operable values). We believe it's important you and your customers understand the operable performance levels of the opening assemblies you purchase along with the calculated core values.

Door Assembly Operable U-Factor and R-Value Ratings

Door Series/Core	Test Method: ASTM C518 Calculated		Test Method: ASTM C1363 * Operable	
	U-Factor	R-Value	U-Factor	R-Value
707 / Polystyrene	0.16	6.4	0.37	2.7
707 / Polystyrene Kerf	0.16	6.4	0.45	2.2
607 / Polystyrene	0.16	6.4	0.39	2.6
707 / Polyurethane	0.10	10.0	0.35	2.9
777 / Polyurethane	0.09	11.0	0.42	2.4
777E (Trio-E)/Polyurethane	0.09	11.0	0.29	3.4
777E (Trio-E)/Polyurethane Kerf	0.09	11.0	0.36	2.7
707 / Honeycomb	N/A	N/A	0.54	1.9
747 / Fiberglass	0.15	6.8	0.55	1.8

Air Infiltration Testing

What is air infiltration?
Air infiltration: A measurement of the air leakage around the perimeter of a door opening.
CFM: Cubic Feet per minute

Door Series/Core	Test Method: ASTM E283*	
	CFM / SQ FT	CFM / LN FT
All CURRIES door construction with CURRIES Thermal Break Frame	0.04	0.06

* *Tested with hardware from other ASSA ABLOY Group brands including Corbin Russwin, Pemko, McKinney, Sargent and Yale in a CURRIES Thermal Break Frame*

NOTE: Information included in this data sheet is subject to revision without notification.

Core Materials

Polystyrene Coreboard Material Specifications (607, 707, and 737)

The polystyrene foam used in the manufacturing of CURRIES' 607 and 707 series doors is a rigid cellular expanded polystyrene bead board that contains no formaldehyde and is chloroflurocarbon (CFC) and hydrochlorofluorocarbon (HCFC) free. This material meets or exceeds the requirements of ASTM C 578, Type I.

Physical Property	Result	ASTM Test Method
Density, minimum lb/ft³ (kg/m³)	1.0 (16)	C303 or D1622
Thermal resistance (R-factor/inch) of 1.00 in. (25.4 mm) thickness, min. °F-ft²h/Btu (°K-m²/W) 25 °F (-3.9 °C) mean temperature 40 °F (4.4 °C) mean temperature 75 °F (23.9 °C) mean temperature	 4.35 (0.76) 4.17 (0.72) 3.85 (0.67)	C177 or C518
Compressive resistance at yield or 10% deformation, whichever occurs first (with skins intact), minimum, lb/in² (kPa)	10.0 (69)	C161
Flexural strength, minimum, lb/in² (kPa)	25.0 (173)	C203
Water vapor permeance of 1.00 in. (25.4 mm) thickness, perm (ng/Pa-s-m²)	5.0 (287)	E96
Water absorption by total immersion, maximum	4.0 max.	C272
Dimensional stability (change in dimensions), maximum, %	2.0 max.	D2126
Oxygen index, minimum, volume %	24.0	D2863
Flame spread index, maximum	20	E84
Smoke developed index, maximum	150-300	E84
Classification	1	C578

The R-Value at 75° at nominal core thickness is 6.4 (U=0.16)

Polyurethane (Polyisocyanurate) Coreboard Material Specifications (707, 777, and 777E)

The polyurethane door core available in CURRIES' 707 series doors is a rigid cellular polyisocyanurate foam that is HCFC free. This material meets or exceeds the requirements of ASTM C 591, Type I.

Physical Property	Result	ASTM Test Method
Density, average lb/ft³ (kg/m³)	2.0 (32)	D1622
Thermal resistance (R-factor/inch) of 1.00 in. (25.4 mm) thickness, min. °F-ft²-h/Btu (°K-m²/W), typical initial 75°F (23.9°C) mean temperature aged 10 days at mean temperature 158°F (70°C)	 6.06 (1.06) 5.41 (0.95)	C177 or C518
Compressive resistance at yield or 10% deformation, whichever occurs first (with skins intact), minimum, lb/in² (kPa)	17 (117)	C1621
Shear strength, lb/in² (kPa)	16 (110)	C273
Tensile strength, minimum, lb/in² (kPa)	47 (323)	D1623
Water absorption by total immersion, volume %	1.3	C272
Dimensional stability, maximum, % linear change 158 °F, 100% relative humidity, 28 days -40 °F, ambient relative humidity, 28 days 212 °F, ambient relative humidity, 28 days	 +4 -0.6 +0.9	D2126
Closed Cell Content, minimum, %	92.0	D2856
Flame spread index up to 6"	25	E84
Smoke developed index, up to 6"	185	E84

The R-Value at 75° at nominal core thickness is 10.0 (U=0.10)

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Core Materials

Fire Door Temperature Rise Coreboard Material Specifications (727)

The coreboard used in the manufacturing of CURRIES' 727 series temperature rise rated fire doors consists of incombustible minerals formed into a highly insulative, stable panel. This material is asbestos free and provides a 30 minute temperature rise of 250 ˚F or less when used in the 727 series doors.

Physical Property	Result	Test Method
Density, minimum lb/ft³ (kg/m³)	15.0 (250)	C303
Thermal resistance (R-factor/inch) of 1.00 in. (25.4 mm) thickness, min. ˚F-ft²h/Btu (˚K-m²/W) 75 ˚F (23.9 ˚C) mean temperature	3.03 (.53)	ASTM C518
Compressive resistance at yield or 10% deformation, whichever occurs first (with skins intact), minimum, lb/in² (kPa)	125 (865)	C165
Flexural strength, minimum, lb/in² (kPa)	85 (588)	C203
Flame spread index, maximum	10	E84
Smoke developed index, maximum	30	E84

The R-Value at 75˚ at nominal core thickness is 5.0 (U=0.20)

Thermal Resistant Glass Fiber Insulation Material Specifications (747 and 777)

The flexible blanket glass fiber thermal insulation used in CURRIES' 747 series doors is comprised of glass fibers bonded together with a thermo-setting resin and meets or exceeds ASTM C553, Type II requirements.

Physical Property	Result	Test Method
Density, minimum lb/ft³ (kg/m³)	0.75 (12.5)	ASTM C167
Thermal resistance (R-factor/inch) of 1.00 in. (25.4 mm) thickness, min. ˚F-ft²-h/Btu (˚K-m²/W) 75 ˚F mean temperature	2.8 (.49)	ASTM C177 or C518
Flame spread index, maximum	25	ASTM E84
Smoke developed index, maximum	50	ASTM E84
Classification	1	ASTM C553

The R-Value at 75˚ at nominal core thickness is 4.6 (U=0.22)

Thermal Resistant Mineral Wool Insulation (747 Temperature Rise)

The flexible blanket thermal insulation used in CURRIES' 747 rated to 450˚F temperature rise is comprised of mineral wool fibers.

Physical Property	Result	Test Method
Density	8 lb/ft³	ASTM C303
Maximum use temperature, minimum (˚F)	150	ASTM C411 and C447
Thermal Conductivity, minimum (Btu-in./h-ft²-F˚)R factor @ 75˚ F	4.17	ASTM C177, C518, or C1114
Flame spread index, maximum	10	ASTM E84
Smoke developed index, maximum	0	ASTM E84

The R-Value at 75˚ at nominal core thickness is 6.9 (U=0.14)

Honeycomb Core Material Specifications (707)

The paper honeycomb core available as an option in the CURRIES' 607 and 707 Series doors is kraft paper faced.

Physical Property	Result	Test Method
Honeycomb cell paper weight	31-35	N.A.
Kraft facing paper weight	42	N.A.
Compressive strength, typical (lb/in2)	11	ASTM C365
Honeycomb cell size (inch)	1.2	Super Capability

No R-value has been established for this core.

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Acoustic Performance

Sound Transmission Loss Performance Test Results

CURRIES' products are tested in accordance with ASTM E90-04, ASTM E413, and SDI 128 to determine the Sound Transmission Coefficients (STC Value) of the specified assemblies. The higher the STC value, the better the rating.

CURRIES' Product Description	Sound Transmission Coefficient (STC Value)	Test Method
707 Door (Polystyrene core) and Frame Assembly	24	ASTM E90-04
707 Door (polyisocyanurate core)	29	ASTM E90-04
707 Door (Embossed panel)	29	ASTM E90-04
707 Door (Honeycomb)	30	ASTM E90-09
707 Door (Honeycomb) with 6" x 30" Window	30	ASTM E90-09
607 Door	27	ASTM E90-04
757 - STC 32 Door	32	ASTM E90-04
757 - STC 38 Door	38	ASTM E90-02
757 - STC 41 Door	41	ASTM E90-02
757 - STC 41 Pairs	41	ASTM E90-04
757 - STC 43 Door	43	ASTM E90-04
757 - STC 46 Door	46	ASTM E90-04
757 - STC 50 Door	50	ASTM E90-09
757 - STC 52 Door	52	ASTM E90-09
757 - STC 54 Door	54	ASTM E90-09

NOTES:
1. The door and seals were tested in a fully grouted, 16 gauge, M-Series masonry frame.
2. 18 Gauge face sheets tested on 607, 707, 757, STC 32, 38, 50, 52, and 54.
3. 16 Gauge face sheets tested on 757, STC 41, 41 pairs, 43, and 46.
4. All STC values are for operable doors. Sealed opening values should not be used.
5. Air infiltration less than 0.01 cubic foot/minute/ft^2 at 1.57 pounds/ft^2 pressure differential when tested to ASTM E283.
6. See technical manual or contact factory for information on seals that were tested.
7. All CURRIES STC doors are in compliance with HMMA 865-03 and SDI 128

STC	What Can Be Heard
25	Normal speech can be understood quite easily and distinctly through wall
30	Loud speech can be understood fairly well, normal speech heard but not understood
35	Loud speech audible but not intelligible
40	Onset of "privacy"
42	Loud speech audible as a murmur
45	Loud speech not audible; 90% of statistical population not annoyed
50	Very loud sounds such as musical instruments or a stereo can be faintly heard

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Paint Specifications

Surface Preparation

Commercial hollow metal doors and frames are designed to meet the requirements of ANSI A250.8 (formerly SDI 100) and are to be thoroughly cleaned, and chemically treated to insure maximum paint adhesion. All surfaces of the door and frame exposed to view shall receive a factory baked-on applied coat of rust inhibiting prime paint. CURRIES' products can be provided with prime painted finishes meeting the requirements for acceptance stated in ANSI A250.10, *Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces*.

Pre-Treatment

An automatic washing system washes, degreases, and phosphatizes CURRIES' hollow metal products. Maximum metal protection is achieved by phosphatizing prior to painting. Phosphatizing etches the metal, providing an effective surface for paint adhesion. The phosphatized metal prevents the paint from lifting and peeling. The non-metallic phosphate coating resists moisture penetration. Maximum rust protection is achieved by combining phosphatized metal with CURRIES' baked-on rust-inhibiting prime paint.

Prime Paint Tests

Requirements of ANSI A250.10 (formerly ANSI A224.1), Test Procedure and Acceptance Criteria for *Prime Painted Steel Surfaces include:*

- Salt spray testing in accordance with ASTM B117
- Condensation (humidity) testing in accordance with ASTM D4585
- Impact test in accordance with ASTM A2794
- Film adhesion test in accordance with ASTM D3359

CURRIES' product can be provided with factory applied baked-on primers complying to the following performance requirements of ANSI A250.10:

Test	Standard	Hours	Results
Salt Spray	ASTM B117	120	Passed
Condensation	ASTM D4585	240	Passed
Impact Test	ASTM D2794	N.A.	Passed
Adhesion	ASTM D3359	N.A.	Passed

CURRIStain Finish

- CURRIStain door coating system meets the requirements of ANSI A250.3 Test Procedure and Acceptance Criteria for Finish Painted Steel Surfaces.

Door/Frame Prime Paint Properties

The lead and chromate free gray primer paint used on CURRIES' doors and frames may be coated over with an alkyd enamel type of paint. Contact the factory for specific information regarding top coats to be applied over these primers.

Physical Property	Door Primer	Frame Primer	Test Method
Solids by weight, (%)	80	70	ASTM D 2369
Solids by volume, (%)	60	55	formula constants
Resin type	Alkyd	2 Component Epoxy	not applicable
Recommended dry film thickness per coat, (mils)	1.0	1.0	ASTM D 1186
Gloss @ 60˚ light source, (%)	0 (Flat)	15-20	ASTM D 523

NOTE: Information included in this data sheet is proprietary to CURRIES Company and subject to revision without notification.

Windstorm Products

Windstorm Products - Hurricane/Severe Storm

A variety of products are available that meet various state and national code requirements for hurricane.

CURRIES products have been successfully tested and certified to the national consensus standards that are developed through the American Society of Testing Materials (ASTM). These standards are ASTM E330, ASTM E1886, and ASTM E1996 and are included in the International Building Code (IBC). These test methods apply in any state where the IBC has been adopted.

The state of Florida has been divided into two areas. Dade and Broward counties in South Florida have been designated as the High Velocity Hurricane Zone (HVHZ). Products installed in the High Velocity Hurricane Zone must be tested to and meet the requirements of the Florida Building Code's testing Application Standards (TAS) TAS 201, TAS 202, and TAS 203. Products outside the HVHZ must meet the requirements of ASTM E330, ASTM E1886, and ASTM E1996 or ANSI A250.13. CURRIES hurricane rated products meet all these requirements.

Windstorm products for protection from hurricanes are rated by design pressure and impact energy. The design pressure is pounds per square foot (psf) and impact rating is in foot-pounds (t-lbs). The impact energy may also be designated by the speed and weight of the 2x4 used for impact. The most common speed is 50 feet per second (approx. 33 miles per hour) and the most common weight of the 2x4 is 9 lbs. A 9 lb. 2x4 at 50 feet per second results in an impact energy of 350 ft-lbs. There are other impact energies that may be required depending on the use of the building. For example, a hospital or hurricane shelter may require a higher impact energy. The design professional for the building should provide the required design pressure and impact energy.

Windstorm Products - Tornado

StormPro™ 320/361
StormPro™ 320/361 door/frame/hardware assembly meets the debris impact criteria for storm shelters of the Federal Emergency Management Agency (FEMA 320/FEMA 361) and /or International Code Council/National Storm Shelter Association ICC 500.

	Debris Impact	Pressure
StormPro 361	15 lb. 2x4 at 100 mph (outswing door)	250 lb/ft^2 @ 5 seconds
StormPro 320	15 lb. 2x4 at 100 mph (inswing door)	197 lb/ft^2 @ 5 seconds

Certification of Products

CURRIES products are certified by Underwriters Laboratories and Warnock Hersey for hurricane performance and by Underwriters Laboratories for tornado performance. CURRIES windstorm hurricane products are approved by the Florida Building Commission and the Texas Department of Insurance.

Please visit CURRIES website or contact your CURRIES Customer Service Professional for more information.

NOTE: Information included in this data sheet is proprietary to CURRIES Company and subject to revision without notification. Please refer to curries.com website for updated windstorm product listings.

Security Product

Commercial Security Hollow Metal Doors and Frames

CURRIES' 847 and 857 door/frame systems meet the requirements for jamb/wall stiffness, door impact, and glazing panel impact as specified in NAAMM HMMA 862-87 and ASTM F476. Refer to the table or Specifications listed for test requirements. Hardware preparations for 2" doors may not fit 1-3/4" doors (847). Contact factory for availability.

Security Grades and Test Load Requirements per NAAMM HMMA 862-87

Door Series	Grade No.	Door Face Sheet and Frame Thickness gauge (in) min.	Jamb/ Wall Stiffness Test (lb)	Impact 59 (ft-lb)	Impact 89 (ft-lb)	Impact 118 (ft-lb)	Impact 148 (ft-lb)	Glazing Impacts 74 (ft-lb)	ASTM
857	40	14 (.073)	4,950	2	2	2	2	10	F476
847	40	14 (.073)	4,950	2	2	2	2	10	F476

NAAMM HMMA 862 Guide Specifications for Commercial Security Hollow Metal Doors and Frames
ASTM F476 Standard Test Methods for Security of Swinging Doors Assemblies.

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