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September 2009

RE: L Ratings for FlameSafe Firestopping Systems

To whom it may concern:

FlameSafe® Firestopping Systems were tested and achieved several L Ratings. An L Rating is a measurement of air passage through a firestopping system, measured in Cubic Feet per Minute per Square Foot (CFM/ Sq. Ft.) for through-penetration firestopping systems and Cubic Feet per Minute per Linear Foot (CFM/Lin. Ft.) for fire resistive joint systems. Smoke can be a severe hazard in fire conditions that may be more dangerous than the fire itself. As a result, the L Rating may be used to evaluate the capability of a firestopping system to prevent passage of smoke through the system. The standard test method to evaluate the L Rating requires a firestopping system to be exposed to an air pressure differential of 0.30 in. water (75 Pa) at ambient test room temperatures, $75 \pm 20^\circ\text{F}$ ($24 \pm 11^\circ\text{C}$) and at elevated temperatures, $400 \pm 10^\circ\text{F}$ ($204 \pm 5^\circ\text{C}$).

Attached is a list of the FlameSafe Firestopping Systems that have achieved L Ratings with the published associated L Ratings. Please note the minimum detectable limit of the test apparatus used for the test standard is *Less than 1 CFM/Square Foot* for through-penetration firestopping systems and *Less than 1 CFM/Linear Foot* for fire resistive joint systems. Therefore, *Less than 1 CFM/Square Foot* (<1 CFM/Sq. Ft.) for through-penetrant firestopping systems is the best achievable L Rating per the test standard. *Less than 1 CFM/Linear Foot* (<1 CFM/Lin. Ft.) for joint firestopping systems is the best achievable L Rating per the test standard.

The attached list is a reference guide for the FlameSafe Firestopping Systems. The actual third party tested system should be reviewed and utilized for full details of the firestopping system.

Please contact us if there are any questions.

Sincerely,

Terry Gossett
Technical Service



<u>System</u>	<u>DESCRIPTION</u>	<u>F RATING</u>	<u>PRODUCT</u>	<u>L Rating at Ambient</u>	<u>L Rating at 400F</u>
<u>BLANK OPENINGS</u>					
CAJ0012	Max. 15 in. diameter opening (Optional Steel Sleeve)	3 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
<u>METALLIC PENETRANTS</u>					
<u>CONCRETE</u>					
CAJ1235	Max. 24 in. steel, max. 6 in. copper, or max. 4 in. EMT w/ max. 26 in. diameter opening	2 & 3 hr.	FS 1900 or 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
CAJ1236	Max. 12 in. steel or iron, max. 6 in. copper, or max. 4 in. EMT w/ max. 16 in. diameter opening	3 hr.	FS 3000	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
CAJ1403	Max. 8 in. steel or iron, max. 4 in. copper or EMT w/ max. 9-5/8 in. dia. opening (One sided)	2 or 3 hr.	FS 1900 or 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
CAJ1406	Up to 8, max. 6 in. steel or 4 in. copper, or max. 2 in. EMT w/ max. 15-1/4 in. opening	2 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
CAJ1426	Up to 24, max. 4 in. steel, iron, or EMT or 1-1/2 in. copper w/ max. 48 x 18 in. opening	2 hr.	FS 3000	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
CAJ1502	Multiple max. 1-1/2 in. flexible metallic conduit w/ max. 6 in. diameter opening.	2 or 3 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
CAJ1528	Max. 12 in. steel, iron or max. 4 in. copper w/ max. 14 in. diameter opening. T Rating - 2 HOUR	3 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WJ1090	Multi. Pene., max. 3 in. steel, iron, or EMT w/ max. 91 sq. in. opening	2 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
<u>WOOD FRAMED CHASE WALLS AND FLOORS</u>					
FC1084	Max. 4 in. steel pipe or EMT, or max. 3 in. copper pipe w/ max. 5 in. diameter opening	1 & 2 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
FC1125	Multiple max. 1-1/2 in. flexible metallic conduit w/ max. 4 in. diameter opening.	1 & 2 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
<u>STEEL FRAMED CONCRETE FLOORS</u>					
FE1005	Max. 4 in. steel pipe or EMT, or max. 3 in. copper pipe w/ max. 5 in. diameter opening	1 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
FE1006	Up to 3, max. 1 in. flexible steel conduit w/ max. 2 in. diameter opening	1 hr.	FS 1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
<u>GYPSUM WALLS</u>					
WL1152	Max. 24 in. steel pipe, 6 in. copper pipe, or 4 in. EMT w/ max. 26+ in. diameter opening	1 & 2 hr.	FS 1900/900/900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WL1207	Multi. Pene., max. 3 in. steel, iron, or EMT w/ max. 91 sq. in. opening	1 & 2 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WL1343	Multiple max. 1-1/2 in. flexible steel conduit w/ max. 6 in. diameter opening.	1 & 2 hr.	FS 900+	1.7 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
<u>NONMETALLIC PENETRANTS</u>					
<u>CONCRETE</u>					
CAJ2201	Max. 3 in. RNC, PVC, CPVC, ABS or FRPP pipe w/ max. 6 in. diameter opening	3 hr.	FSWS150/FS1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
CAJ2212	Max. 5 in. RNC, PVC, CPVC or 4 in. ABS pipe w/ 6 in. diameter opening	2 & 3 hr.	FSWS 150 Collar	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
CAJ2351	Max. 3 in. PVC or ABS pipe w/ max. 5 in. opening (One sided)	2 hr.	FSWS150/FS1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
CAJ2375	Max. 4 in. RNC, PVC, CPVC or ABS pipe w/ max. 7 in. opening	2 hr.	FSWS150/FS1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
CAJ2376	Max. 6 in. RNC or 10 in. PVC, CPVC pipe w/ max. 11 in. diameter opening	2 hr.	FSD/FS1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
CAJ2432	Max. 2 in. RNC, CPVC or PVC w/ max. 4 in. diameter opening	2 & 3 hr.	FS 1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
CAJ2509	Max. 8 in. RNC, CPVC or PVC w/ max. 11 in. diameter opening	3 hr.	FSIS/FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WJ2086	Max. 6 in. Glass w/ max. 8 in. opening	2 hr.	FS 1900 or 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WJ2102	Up to 3, max. 1 in. PEX tubing w/ max. 4 in. opening	2 hr.	FS 1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
FA2104	Max. 4 in. PVC or CPVC overlapping max. 4 in. metallic pipe w/ max. 6 in. opening	2 hr.	FSIS/FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
FA2113	Max. 4 in. PVC or ABS water closet (toilet) drain pipe w/ max. 6 in. opening	2 hr.	FS 1900 or 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
<u>WOOD FRAMED CHASE WALLS AND FLOORS</u>					
FC2042	Max. 2 in. RNC, PVC, or CPVC pipe w/ max. 4 in. diameter opening	1 & 2 hr.	FS 1900 or 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
FC2082	Max. 4 in. RNC, PVC, CPVC or ABS pipe w/ max. 5 in. dia. Opening	1 hr.	FS 1900 or 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
FC2087	Max. 4 in. PVC or ABS waste pipe & closet flange w/ max. 5 in. diameter opening	1 hr.	FS 1900 or 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
FC2089	Max. 1-1/2 in. PVC bathtub waste & overflow w/ max. 8 x 12 in. opening	1 hr.	FS 1900 or 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
FC2090	Max. 4 in. ABS pipe & p-trap drain pipe w/ max. 5 in. diameter opening	1 hr.	FSWS 100 Collar	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
FC2091	Max. 4 in. PVC, CPVC or ABS pipe & p-trap drain pipe w/ max. 5 in. opening	1 hr.	FS 1900 or 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
FC2164	Max. 4 in. RNC, PVC, CPVC or ABS w/ max. 5 in. opening	1 hr.	FS 1900 or 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
FC2221	Up to 3, max. 1 in. PEX tubing or 3/4 in. PEX-AL-PEX tubing w/ max. 3 in. opening	1 & 2 hr.	FS 1900 or 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
<u>STEEL FRAMED CONCRETE FLOORS</u>					
FE2007	Up to 3, max. 1 in. PEX tubing w/ max. 3 in. opening	1 hr.	FS 1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
FE2008	Max. 2 in. RNC, ABS, PVC, or CPVC pipe w/ max. 3 in. diameter opening	1 hr.	FSWS100/FS1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
FE2009	Max. 4 in. RNC, PVC, CPVC or ABS pipe w/ max. 5 in. diameter opening	1 hr.	FSWS 100 Collar	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
<u>GYPSUM WALLS</u>					
WL2166	Max. 4 in. RNC, PVC, CPVC, ABS, FRPP, or Glass w/ 6 in. opening	1 & 2 hr.	FSIS/FS 900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WL2167	Max. 4 in. RNC, PVC, CPVC or ABS w/ max. 5 in. diameter opening	1 & 2 hr.	FSWS 100 Collar	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WL2168	Max. 3 in. RNC, CPVC or PVC w/ max. 5 in. diameter opening	1 & 2 hr.	FSWS150/FS1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WL2170	Max. 2 in. RNC or PVC, max. 1-1/2 in. ABS, PEX or ENT (smurf) w/ max. 4 in. dia. opening	1 & 2 hr.	FS 1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WL2185	Max. 6 in. RNC or 8 in. PVC or CPVC pipe w/ max. 10-1/2 in. diameter opening	1 & 2 hr.	FSIS/FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WL2258	Max. 6 in. Glass w/ max. 8 in. opening	1 & 2 hr.	FS 1900 or 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WL2259	Max. 2 in. RNC, PVC, CPVC or ABS w/ max. 4 in. diameter opening	1 & 2 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WL2287	Up to 3, max. 1 in. PEX tubing w/ max. 4 in. opening	1 & 2 hr.	FS 1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
<u>CABLES</u>					
<u>CONCRETE</u>					
CAJ3016	Max. 11% fill of multiconductor and telecom cables w/ max. 8 in. diameter opening	2 hr.	FSP 1000	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
CAJ3199	Max. 40% fill of multiconductor and telecom cables w/ max. 4-3/8 in. diameter opening	3 hr.	FS 1900	< 1 CFM/Sq. Ft.	1.4 CFM/Sq. Ft.
CAJ3234	Max. 3 in. diameter bundle of telecom, Romex, SER, power and metal clad cables w/ 6 in. dia. opening.	2 hr.	FS 900+	< 1 CFM/Sq. Ft.	1.4 CFM/Sq. Ft.
WJ3083	Max. 38% fill of multiconductor and telecom cables thru optional 4 in. diameter sleeve	2 hr.	FSP1000	< 1 CFM/Sq. Ft.	1.4 CFM/Sq. Ft.
WJ3084	Max. 19% fill of multiconductor and telecom cables thru optional 4 in. diameter sleeve	2 hr.	FS 900+	< 1 CFM/Sq. Ft.	1.4 CFM/Sq. Ft.
WJ3102	Max. 56% fill of multiconductor and telecom cables thru max. 4 in. diameter EMT sleeve	2 hr.	FS 1900	< 1 CFM/Sq. Ft.	1.4 CFM/Sq. Ft.
<u>WOOD FRAMED CHASE WALLS AND FLOORS</u>					
FC3060	Telecom, Romex, coaxial, and metal clad cables w/ max. 4 in. diameter opening	1 & 2 hr.	FS 900+	< 1 CFM/Sq. Ft.	1.4 CFM/Sq. Ft.
<u>STEEL FRAMED CONCRETE FLOORS</u>					
FE3006	Telecom, Romex, coaxial, and metal clad cables w/ max. 4 in. diameter opening	1 hr.	FS 900+	< 1 CFM/Sq. Ft.	1.4 CFM/Sq. Ft.
<u>GYPSUM WALLS</u>					
WL3119	Max. 40% fill of multiconductor and telecom cables w/ max. 5 in. diameter opening	1 & 2 hr.	FS 1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WL3179	Max. 2-3/4 in. bundle of coaxial, multiconductor, and telecom cables w/ max. 4 in. dia. opening	1 & 2 hr.	FS 1900	< 1 CFM/Sq. Ft.	1.4 CFM/Sq. Ft.
WL3198	Max. 38% fill of multiconductor and telecom cables thru max. 4 in. diameter EMT sleeve	1 & 2 hr.	FSP1000	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WL3199	Max. 19% fill of multiconductor and telecom cables thru max. 4 in. diameter EMT sleeve	1 & 2 hr.	FS 900+	< 1 CFM/Sq. Ft.	1.4 CFM/Sq. Ft.
WL3223	Max. 56% fill of multiconductor and telecom cables thru max. 4 in. diameter EMT sleeve	1 & 2 hr.	FS 1900	< 1 CFM/Sq. Ft.	1.4 CFM/Sq. Ft.
WL3269	Max. 64% fill (4 in. bundle) of coaxial, telecom, metal clad and SER cables thru max. 5 in. diameter opening	1 & 2 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.

<u>System</u>	<u>DESCRIPTION</u>	<u>F RATING</u>	<u>PRODUCT</u>	<u>L Rating at Ambient</u>	<u>L Rating at 400F</u>
<u>CABLE TRAYS</u>					
<u>CONCRETE AND BLOCK WALLS</u>					
CAJ4027	One cable tray max. 24 x 3-1/2 in. w/ max. 324 sq. in. opening	3 hr.	FSM 22	2 CFM/Sq. Ft.	3 CFM/Sq. Ft.
<u>INSULATED PIPES</u>					
<u>CONCRETE</u>					
CAJ5238	Up to 6, max. 3 in. metallic pipes with max. 3/4 in. AB/PVC foam insul. w/ max. 24 x 6 in. opening	3 hr.	FS 1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
CAJ5243	Max. 10 in. steel pipe with max. 2 in. fiberglass insulation w/ max. 16 in. diameter opening	2 hr.	FlameSafe Silicone	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
CAJ5283	Max. 24 in. steel, iron or 6 in. copper pipe with max. 2 in. fiberglass insulation w/ max. 30 in. diameter opening	3 hr.	FS900+/FS1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WJ5036	Max. 10 in. steel or iron or 6 in. copper pipe with max. 3 in. foamglas insul. w/ max. 18 in. diameter opening	2 hr.	FS 1900 or 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WJ5043	Max. 12 in. metallic pipe with 3 in. fiberglass insul. w/ max. 20 in. diameter opening	2 hr.	FSWS100/FS1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WJ5081	Max. 12 in. metallic pipe with 3/4 in. AB/PVC foam insul. w/ max. 15-1/4 in. diameter opening	2 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
<u>WOOD FRAMED CHASE WALLS AND FLOORS</u>					
FC5011	Max. 1-1/2 in. metallic pipe with 1 in. FG or 3/4 in. AB/PVC w/ max. 4-3/4 in. diameter opening	1 hr.	FS 1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
FC5059	Max. 3 in. metallic pipe with 1 in. fiberglass insul. w/ max. 6 in. diameter opening	1 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
<u>STEEL FRAMED CONCRETE FLOORS</u>					
FE5003	Max. 1-1/2 in. metallic pipe with 1 in. FG or 3/4 in. AB/PVC w/ max. 4-3/4 in. diameter opening	1 hr.	FS 1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
<u>GYPSUM WALLS</u>					
WL5087	Max. 10 in. steel or iron or 6 in. copper pipe with max. 3 in. Foamglas insul. w/ max. 18 in. diameter opening	1 & 2 hr.	FS 1900 or 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WL5097	Max. 12 in. metallic pipe with 3 in. fiberglass insul. w/ max. 20 in. diameter opening	1 & 2 hr.	FSWS100/FS1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WL5171	Max. 12 in. steel or iron pipe with 2 in. fiberglass insul. w/ max. 18-5/16 in. diameter opening	1 & 2 hr.	FS 1900 or 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WL5172	Max. 12 in. metallic pipe with 2 in. fiberglass insul. through max. 18-3/4 in. dia. sleeve	1 & 2 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WL5173	Max. 12 in. metallic pipe with 3/4 in. AB/PVC foam insul. w/ max. 15-1/4 in. diameter opening	1 & 2 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WL5193	Max. 6 in. metallic pipe with 3 in. fiberglass insul. through max. 14 in. dia. sleeve	1 & 2 hr.	FS 1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
<u>MISCELLANEOUS ELECTRICAL PENETRANTS</u>					
<u>CONCRETE</u>					
CAJ6013	One busway max. 27 x 6 in. w/ max. 360 sq. in. opening	2 hr.	FS 1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
CAJ6027	One busway max. 19 x 6 in. w/ max. 345 sq. in. opening	3 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
<u>MISCELLANEOUS MECHANICAL PENETRANTS</u>					
<u>CONCRETE</u>					
CAJ7067	Max. 24 x 12 in. steel duct, min No. 24 ga. w/ max. 364 sq. in. opening (One sided)	2 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
CAJ7074	Max. 36 x 20 in. oval steel duct, min No. 24 ga. w/ max. 781 sq. in. opening	2 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
CAJ7082	Max. 24 in. round steel duct, min. No. 22 ga. w/ max. 28 in. diameter opening	3 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
CAJ7087	Max. 6 in. round steel duct, min. No. 24 ga. w/ max. 8-1/2 in. diameter opening (One sided)	2 hr.	FS 1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WJ7044	Max. 20 x 20 in. steel duct, min No. 24 ga., max. 498 sq. in. opening	2 hr.	FS 3000	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WJ7045	Max. 67 x 18 in. steel duct, min No. 24 ga., max. 1470 sq. in. opening	2 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WJ7046	Max. 30 x 24 in. insulated steel duct, min No. 24 ga., max. 1050 sq. in. opening	2 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
<u>WOOD FRAMED CHASE WALLS AND FLOORS</u>					
FC7008	Max. 10 x 6 in. steel duct, min. No. 24 ga. w/ max. 12 x 8 in. opening	1 hr.	FS 1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
FC7019	Max. 6 in. round steel duct, min. No. 30 ga. w/ max. 6-1/2 in. diameter opening	1 & 2 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
<u>STEEL FRAMED CONCRETE FLOORS</u>					
FE7003	Max. 6 in. round steel duct, min. No. 30 ga. w/ max. 6-1/2 in. diameter opening	1 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
<u>GYPSUM WALLS</u>					
WL7046	Max. 20 in. diameter steel duct, min No. 22 ga., max. 22 in. diameter opening	1 & 2 hr.	FS 1900 or 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WL7080	Max. 20 x 20 in. steel duct, min No. 24 ga., max. 498 sq. in. opening	1 & 2 hr.	FS 3000	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WL7081	Max. 67 x 18 in. steel duct, min No. 24 ga., max. 1470 sq. in. opening	1 & 2 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WL7082	Max. 30 x 24 in. insulated steel duct, min No. 24 ga., max. 1050 sq. in. opening	1 & 2 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
WL7120	Max. 20 in. diameter steel duct w/ 1-1/2 in. fiberglass insulation, min No. 28 ga., max. 23 in. opening	1 & 2 hr.	FSWS150/FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
<u>MIXED PENETRANTS</u>					
<u>CONCRETE</u>					
CAJ8101	Max. 4 in. metallic and insul. pipe with mixed ele. cable w/ max. 144 sq. in. opng. (2-1/2 in. slab)	2 hr.	FS 900+	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
CAJ8161	Max. 1 in. metallic and insul. pipe with mixed ele. cable w/ max. 4 in. diam opening	2 hr.	FS 900+ or FS 1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
<u>WOOD FRAMED CHASE WALLS AND FLOORS</u>					
FC8002	Max. 2 in. metallic and insul. pipe with mixed ele. cable w/ max. 6 in. diameter opening	1 & 2 hr.	FS 1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.
<u>STEEL FRAMED CONCRETE FLOORS</u>					
FE8004	Max. 3/4 in. multiple pipe penetrants w/ ele. cable, max. 4-1/2 in. diameter opening	1 hr.	FSWS100/FS1900	< 1 CFM/Sq. Ft.	< 1 CFM/Sq. Ft.

PERIMETER BARRIERS (CURTAIN WALLS)

<u>System</u>	<u>DESCRIPTION</u>	<u>F RATING</u>	<u>PRODUCT</u>	<u>L Rating at Ambient</u>	<u>L Rating at 400F</u>
CEJ290P	Steel framed wall w/ steel panels (insulated stud cavity)	2 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
CEJ152P	Steel studded wall w/ min. 1-1/2 in. thick concrete panels (vision glass min. 6 in. above floor)	2 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
CEJ193P	Steel framed wall w/ max. 4 in. thick polystyrene (EIFS) exterior	1 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
CEJ273P	Steel framed wall w/ max. 4 in. thick EIFS and cementitious coat (vision glass min. 6 in. above floor)	2 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
CEJ274P	Steel framed wall w/ max. 4 in. thick EIFS and plaster coat (vision glass min. 6 in. above floor)	2 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
CEJ275P	Steel framed wall w/ stone veneer exterior (vision glass min. 6 in. above floor)	2 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
CEJ276P	Steel framed wall w/ brick veneer exterior (vision glass min. 6 in. above floor)	2 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
CEJ150P	Steel framed wall w/ interior gypsum and brick veneer exterior (vision glass min. 6 in. above floor)	2 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
CEJ151P	Min. 1-1/2 in. thick concrete tilt-up panels (vision glass min. 6 in. above floor)	2 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
CEJ153P	Aluminum framed wall w/ min. 1-1/2 in. thick concrete panels (vision glass min. 6 in. above floor)	2 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
CEJ154P	Aluminum framed wall w/ heat strengthened glass panels (min. 34 in. spandrel height)	2 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
CEJ296P	Aluminum framed wall w/ heat strengthened glass panels (min. 34 in. spandrel height)	2 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
CEJ297P	Aluminum framed wall w/ aluminum panels (min. 34 in. spandrel height)	2 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
CEJ301P	I Shaped aluminum framed wall w/ heat strengthened glass panels (min. 34 in. spandrel height)	2 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
CEJ302P	Aluminum framed wall w/ heat strengthened glass panels (min. 34 in. spandrel height)	2 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
CEJ303P	Aluminum framed wall w/ aluminum panels (min. 34 in. spandrel height)	2 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
CEJ318P	Aluminum framed wall w/ heat strengthened glass panels (min. 10 in. spandrel height)	2 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
CEJ319P	Aluminum framed wall w/ aluminum panels (min. 10 in. spandrel height)	2 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.

JOINTS

<u>System</u>	<u>DESCRIPTION</u>	<u>F RATING</u>	<u>PRODUCT</u>	<u>L Rating at Ambient</u>	<u>L Rating at 400F</u>
<u>FLOOR TO FLOOR</u>					
FFD0022	6 in. Concrete floor to concrete floor, max. 2 in. joint width	4 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
FFD0029	2-1/2 in. Concrete floor to concrete floor, max. 2 in. joint width	1 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
FFD1024	4-1/2 in. Concrete floor to concrete floor, max. 3-1/2 in. joint width	3 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
<u>FLOOR TO WALL</u>					
FWD0001	4-1/2 in. Concrete floor to 4-1/2 in. concrete or block wall, max. 2 in. joint width	3 hr.	FS 1900	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
FWD0017	6 in. Concrete floor to 6 in. concrete or block wall, max. 2 in. joint width	4 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
FWD0024	2-1/2 in. Concrete floor to 4-1/2 in. concrete or block wall, max. 2 in. joint width	1 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
FWD1020	4-1/2 in. Concrete floor to 4-1/2 in. concrete or block wall, max. 3-1/2 in. joint width	3 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
<u>WALL TO WALL</u>					
WWD1028	Concrete or block wall to concrete or block wall, max. 3-1/2 in. joint width	3 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
<u>HEAD (TOP) OF WALL</u>					
HWD0108	Gypsum wall to concrete floor, max. 2 in. joint width	1, 2, 3 & 4 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
HWD0107	Gypsum wall parallel/perpendicular to fluted deck (with/without fireproofing), max. 2 in. joint width	1, 2, 3 & 4 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
HWD0327	Gypsum wall to fluted deck, max. 1 in. joint width (parallel between flutes)	1 & 2 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
HWD0267	Gypsum wall under I-Beam (with fireproofing) supporting fluted deck, max. 1 in. joint width	1, 2, & 3 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
HWD0299	Gypsum wall w/ penetrating I-Beam (with fireproofing) supporting fluted deck, max. 1 in. joint width	1, 2, & 3 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
HWD0390	Gypsum wall to fluted deck, max. 1 in. joint width, beam or joist adjacent & parallel to one side of wall	1 & 2 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
HWD0006	Concrete or block wall to concrete floor, max. 2 in. joint width	3 hr.	FS 1900	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
HWD0109	Concrete or block wall to concrete floor, max. 2 in. joint width	3 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
HWD1021	Concrete or block wall to concrete floor, max. 3-1/2 in. joint width	3 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
HWD0110	Concrete or block wall parallel/perpendicular to fluted deck (with/without fireproofing), max. 2 in. joint	3 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
HWD0328	Concrete or block wall to fluted deck, max. 2 in. joint width (installed from one side)	3 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
HWD0284	Concrete wall under I-Beam (with fireproofing) supporting fluted deck, max. 1 in. joint width	3 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
HWD0300	Concrete wall w/ penetrating I-Beam (with fireproofing) supporting fluted deck, max. 1 in. joint width	3 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
HWD0331	Concrete or block wall parallel to fluted deck, max. 2 in. joint width (installed from one side)	3 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.
HWD0391	Concrete wall to fluted deck, max. 1 in. joint width, beam or joist adjacent & parallel to one side of wall	2 hr.	FS 3000	< 1 CFM/Lin. Ft.	< 1 CFM/Lin. Ft.