





One of the largest base isolated hospitals constructed in the United States—able to glide 30 inches in every direction during a seismic event



Project: Zuckerberg San Francisco General Hospital and Trauma Center

Architect: Fong & Chan Architects

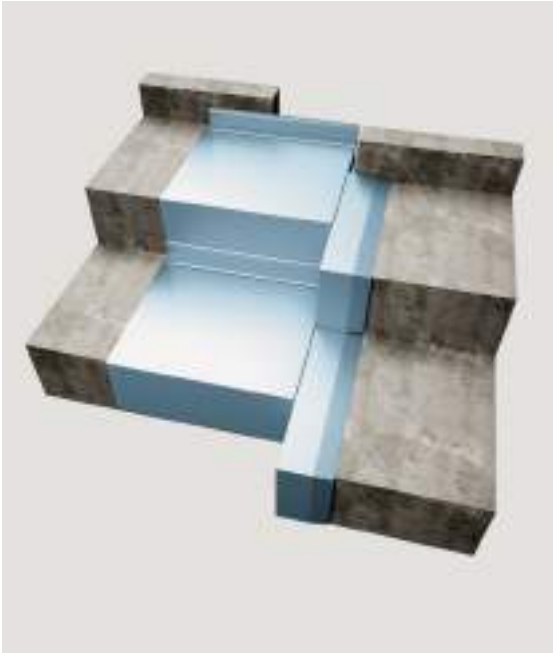
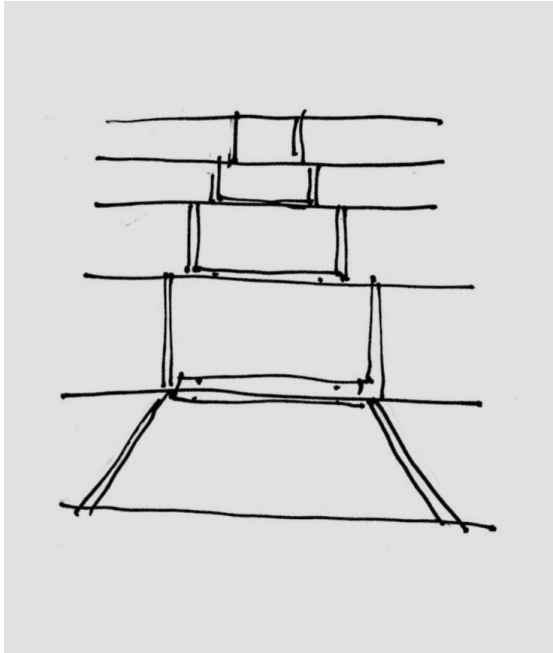
Products: MACC Multi-Axial Corridor Cover System, MARC Roof Covers, SSRW Seismic Moat Covers, XLSC Exterior Wall Covers

The Zuckerberg San Francisco General Hospital and Trauma Center serves more than 100,000 patients annually. Located on the San Andreas fault line, California building code mandates strict seismic standards for new construction. Collaboration with CS made it possible for "The General" to be able to glide 30 inches in every direction during a seismic event. CS' Multi-Axial Corridor Cover (MACC) system seamlessly connects the new hospital tower to the existing structure while the exterior moat covers visually unite the landscape and sidewalk with the structure.



Construction Specialties, Inc. holds a patent(s) on one or more of the products listed herein. For detailed patent information, see www.csgroup.com/patents.

From the initial concept sketch only CS can design and test a custom cover to meet your project's requirements.



CS has been helping architects solve complex building movement problems for over 45 years. We understand that every project has its own special movement criteria, and that one of our standard designs may not be right for your project. We have a team of technical experts that can work with you to design a custom cover that meets your project's specific requirements. We can show you in person how your expansion joint cover will function and operate under real-life conditions with our exclusive full-scale test chamber, which has evaluated some of the industry's largest joint covers.



Project: California Memorial Stadium
Architect: HNTB Architects & STUDIOS Architecture
Product: Customized Seismic Stair System

Located directly over the Hayward Fault, California Memorial Stadium was the first facility to require 12" expansion, compression and lateral movement. In less than 21 months, we designed, tested and fabricated the custom joint cover assemblies for six seismic joint openings around the stadium bowl. These custom stair risers and treads throughout the stadium help reduce seismic risk and ensure life safety in a major seismic event.



THE CS DIFFERENCE

We pride ourselves on delivering the highest quality products.

Our exclusive edge protection eliminates chipping and cracking of pavers.

The modular pan's design eliminates deflection and cracking.

Exclusive Delrin® bearing allows cover to move smoothly and prevents binding, unlike covers using metal-to-metal components.

The cover's modular pan accepts matching floor finishes, making it virtually invisible in interior and exterior applications.

We offer the industry's largest joint cover widths.

The gravity-activated turnbar returns the cover smoothly to its normal position after an event.

Choose the right cover.
Choose CS.



LAF INTERIOR WALL COVER

Multi-directional seismic forces can create havoc with conventional turnbars, especially in wall covers. This wall cover system was designed to disengage during a seismic event, but remain tethered to prevent falling, while protecting the surrounding finishes from damage.



XLS EXTERIOR WALL COVER

Designed to conceal large seismic joints, the key to this exclusive cover features an innovative gravity closing system that automatically resets the cover after a seismic event. The cover can receive a wide variety of cladding systems including metal, glass and stone.



City Creek Center
Architects: ZGF Architects LLP, Callison, Hobbs+Black
Architects, FFKR Architects & SWA Group



California Memorial Stadium
Architects: HNTB
& STUDIOS Architecture



Cathedral of Christ the Light
Architect: Skidmore, Owings & Merrill, LLP

CS EXPANSION JOINT COVERS

Solving complex
movement problems
for over 45 years



City Center
Architect: HKS Architects



Parkland Hospital
Architects: HDR & Corgan



Fulton Street Transit Center
Architect: Grimshaw Architects










Corporate Headquarters
Architect: VCBO Architecture



Adobe Utah Campus
Architect: WRNS Studio

Selection Chart

Use the selection chart below as a guide on choosing the right expansion joint cover for your next project. Each cover type on the chart includes valuable information such as joint size ranges, finishes that can be applied and corresponding page numbers for more detailed information. If you have questions or have a unique situation, we would love to help. Contact your local representative or call us at 800.233.8493.









Cover Type	Appearance	Joint Size	Description	Finishes	Designed For	Total Movement	Page #	Matching Wall/Ceiling	Fire Barriers	Cost Index
FLOOR COVERS										
Flush Thinline Gasketed		1" and 2"	Minimum exposed surface, sealed dual durometer gasket installation	Carpet, vinyl, ceramic tile, terrazzo, stone	Hygienic, wheeled equipment	50% of joint width	14-15	Pages 30-31	Reflex® Page 45	65
Flush Twinline Dual Gasketed		2" to 4"	Minimum exposed surface, sealed dual durometer gasket installation, larger movement	Carpet, vinyl	Hygienic, wheeled equipment	100% of joint width	16-17	Pages 32-33	Reflex or Multiflex® Page 45	105
Flush Seismic, Seismic Pan		2" and up	Minimum exposed surface, optional sealed gasket installation, seismic movement	Carpet, vinyl, terrazzo, stone	Hygienic, wheeled equipment, deep floor finish materials, also exterior	100-200% of joint width	18-21	Pages 32-33	Multiflex or FB-97 Page 45	125
Restofit™		1" to 4"	Designed for quick and easy installation in both new and retrofit applications	Carpet, vinyl, ceramic tile, terrazzo, stone	Commercial and healthcare interiors	100% of joint width	22-23	Contact Factory	FB-97 or Reflex Page 45	95
Standard Allway™ Metal		1" to 4"	Robust applications, low maintenance	Concrete, carpet, vinyl	Industrial, heavy wheeled equipment	100-200% of joint width	24-25	Pages 34-35	Reflex Page 45	100
Seismic Allway Metal		4" and up	Robust applications, low maintenance, seismic movement	Concrete, pavers, carpet, vinyl, ceramic tile	Industrial, heavy wheeled equipment, also exterior	100-200% of joint width	26-27	Pages 34-35	Multiflex Page 45	N/A
Seismic Corridor Cover		Contact Factory	Corridors in base isolated structures with multi-directional movement	Carpet, vinyl	Commercial and healthcare interiors	100-200% of joint width	28-29	N/A	Contact Factory	N/A

All CS Expansion Joint Covers, Seals and Processes are ISO 9001: 2000 compliant. All CS Expansion Joint Covers feature a 5-year limited warranty. Select expansion joint covers are now available for purchase online. Go to www.csgroup.com/buyejc.

100 Our baseline systems are assigned a cost score of 100. Use the cost index to indicate how each system rates when compared to the baseline score of 100.

Selection Chart

Use the selection chart below as a guide on choosing the right expansion joint cover for your next project. Each cover type on the chart includes valuable information such as joint size ranges, finishes that can be applied and corresponding page numbers for more detailed information. If you have questions or have a unique situation, we would love to help. Contact your local representative or call us at 800.233.8493.

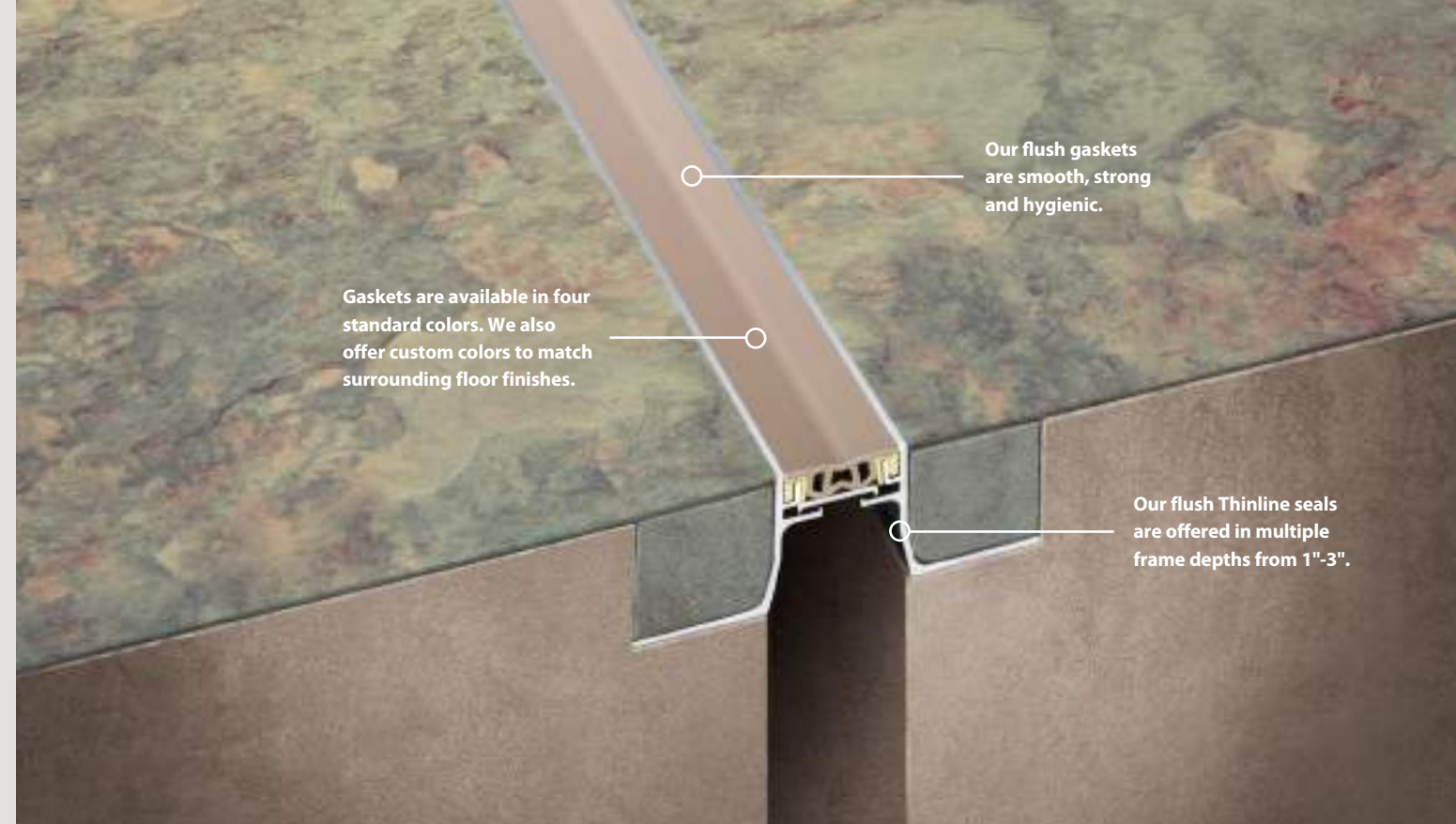
Cover Type	Appearance	Joint Size	Description	Finishes	Designed For	Total Movement	Page #	Matching Floor	Fire Barriers	Cost Index
WALL & CEILING COVERS										
Flush Thinline Gasketed		1" to 10"	Minimum exposed surface, sealed gasket installation	Drywall, ceramic tile	Hygienic, matches Thinline floor covers	50-200% of joint width	30-31	14-15	Reflex® or Multiflex® Page 45	55
Flush Twinline Dual Gasketed		2" and up	Minimum exposed surface, sealed gasket installation, larger movement	Drywall, ceramic tile	Hygienic, matches Twinline floor covers	100-200% of joint width	32-33	16-17	Reflex or Multiflex Page 45	180
Seismic Flush Twinline		4" and up	Minimum exposed surface, optional sealed gasket installation, seismic movement	Drywall, ceramic tile	All commercial and healthcare interiors	100-200% of joint width	32-33	18-21	Multiflex or FB-97 Page 45	N/A
Allway™ Metal		1" to 4"	Robust applications, low maintenance, full movement range	All finishes	Industrial, matches Allway floor covers	100-200% of joint width	34-35	24-25	Reflex or Multiflex Page 45	100
EXTERIOR COVERS										
Exterior Wall		2" and up	Minimum exposed surface, sealed gasket installation, full movement range	All finishes	All exteriors, colorable	100-200% of joint width	36-37	N/A	Contact Factory	150
Seismic Exterior Wall		8" and up	Customizable for larger sized joints, multi-directional movement	All finishes	All exteriors	100-200% of joint width	38-39	N/A	Contact Factory	N/A
Roof		2" and up	Formed aluminum and EPDM bellows options, full movement range	All roof finishes	All roofs	100-200% of joint width	40-41	N/A	Contact Factory	N/A
Parking & Stadiums		1" to 16"	Exterior, waterproof applications, full movement range	Concrete, paver	Vehicular traffic, stadium seating bowls and concourse	50-200% of joint width	42-43	N/A	Contact Factory	N/A

All CS Expansion Joint Covers, Seals and Processes are ISO 9001: 2000 compliant. All CS Expansion Joint Covers feature a 5-year limited warranty. Select expansion joint covers are now available for purchase online. Go to www.csgroup.com/buyejc.

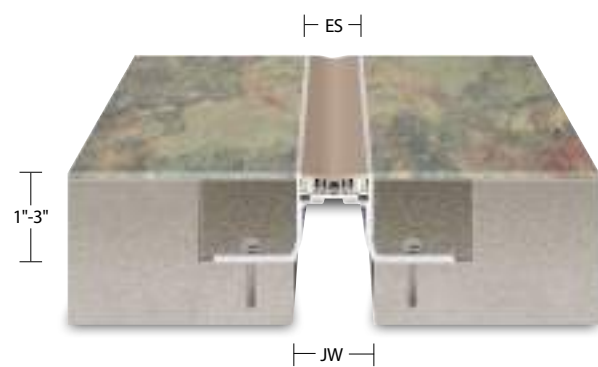
100 Our baseline systems are assigned a cost score of 100. Use the cost index to indicate how each system rates when compared to the baseline score of 100.

Flush Thinline Floor Covers 1"-2"

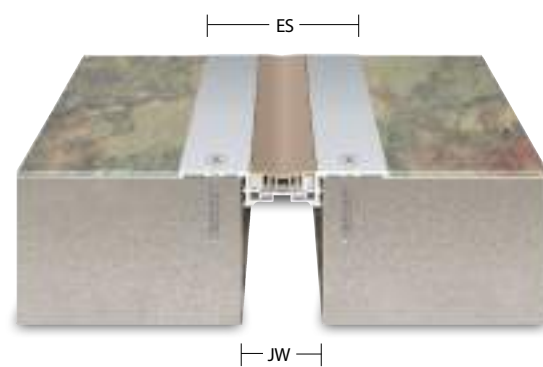
These flush gasketed covers are used for small interior joints where minimal visual impact is preferred. They are perfect for wheeled equipment and are ADA-compliant.



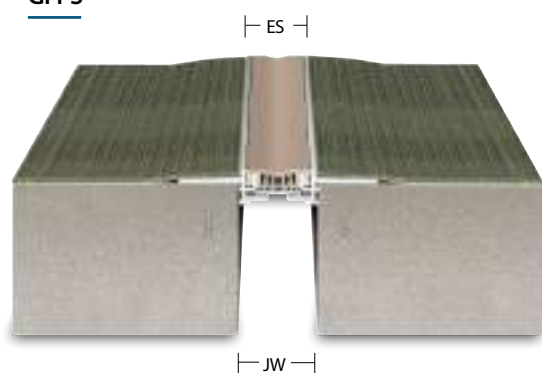
GFT



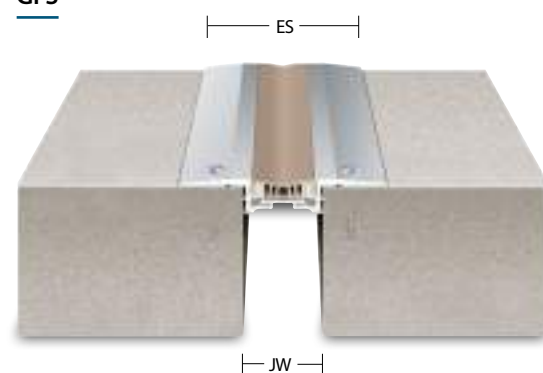
GFST



GFPS



GFS



MODEL DATA

FLOOR TO FLOOR COVERS

JOINT WIDTH	1"	2"	1"	2"	1"	2"	1"	2"
MINIMUM OPENING	0.75"	1.50"	0.75"	1.50"	0.75"	1.50"	0.75"	1.50"
MAXIMUM OPENING	1.25"	2.50"	1.25"	2.50"	1.25"	2.50"	1.25"	2.50"
EXPOSED SURFACE	1.25"	1.88"	1.18"	1.88"	4.31"	5.13"	4.31"	5.13"
SPECIFY MODEL	GFT 100	GFT 200	GFPS 100	GFPS 200	GFS 100	GFS 200	GFST 100	GFST 200

FLOOR TO WALL COVERS

JOINT WIDTH	1"	2"	1"	2"	1"	2"	1"	2"
MINIMUM OPENING	0.75"	1.50"	0.75"	1.50"	0.75"	1.50"	0.75"	1.50"
MAXIMUM OPENING	1.25"	2.50"	1.25"	2.50"	1.25"	2.50"	1.25"	2.50"
EXPOSED SURFACE	1.13"	1.93"	1.09"	1.94"	2.69"	3.56"	2.66"	3.56"
SPECIFY MODEL	GFTW 100	GFTW 200	GFPSW 100	GFPSW 200	GFSW 100	GFSW 200	GFSTW 100	GFSTW 200

For odd and larger sized joints, call 800.233.8493 or visit www.c-sgroup.com/ejc.

GASKET COLORS



Note: Custom colors are available. Call 800.233.8493.



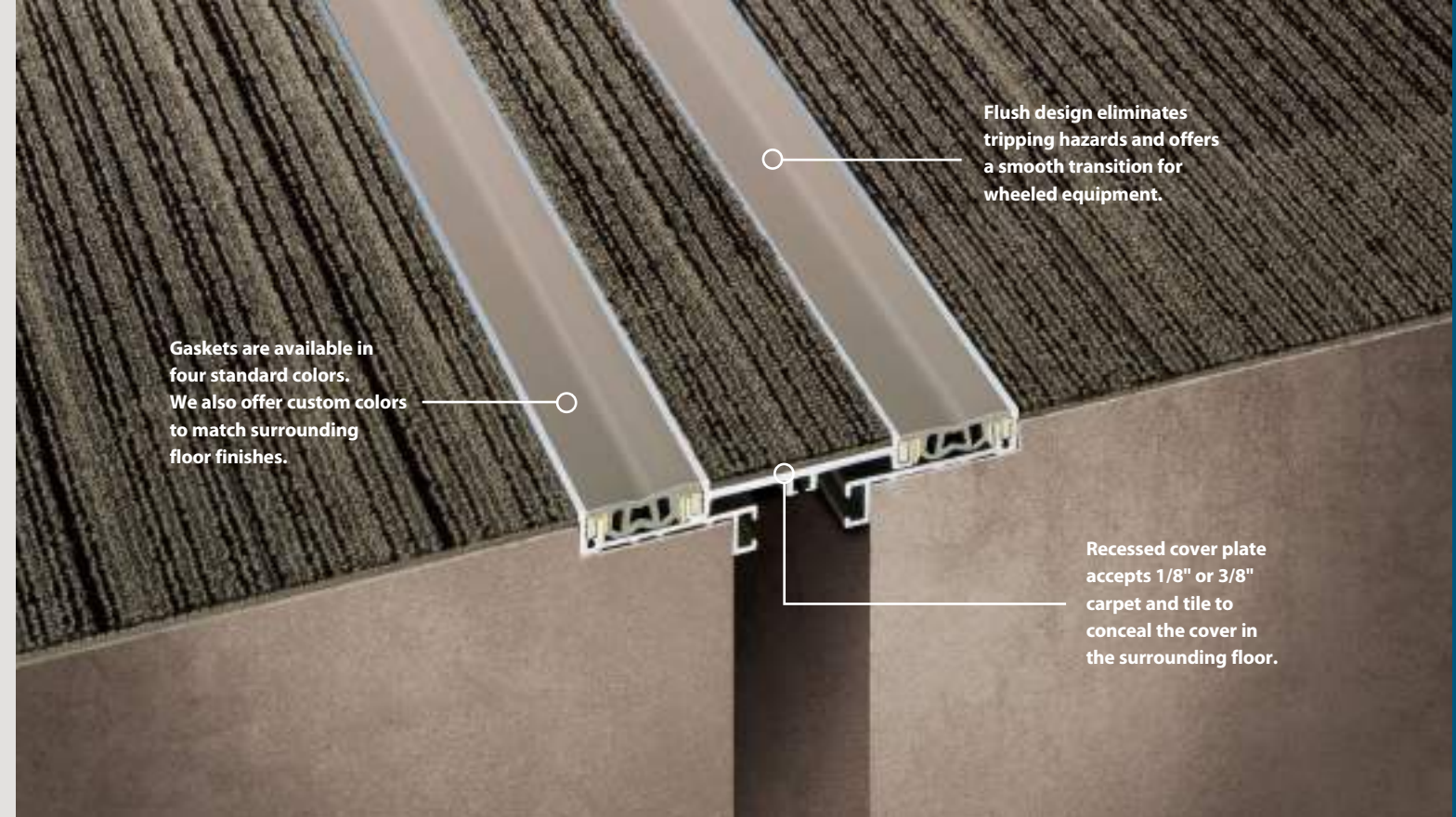
Dual Durometer

- Harder material for stronger, more secure attachment to aluminum extrusions
- Softer material used to allow for thermal movement

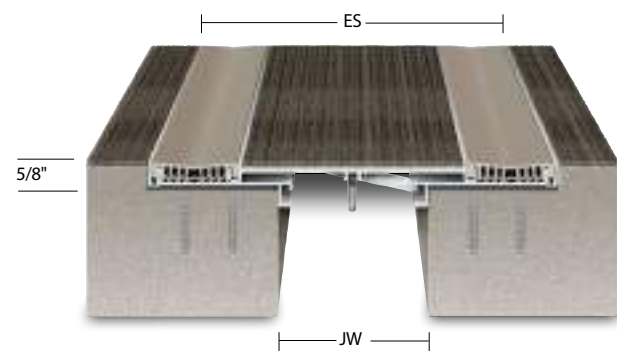
For comprehensive information on these products, visit www.c-sgroup.com/ejc.

Flush Twinline Floor Covers 2"-4"

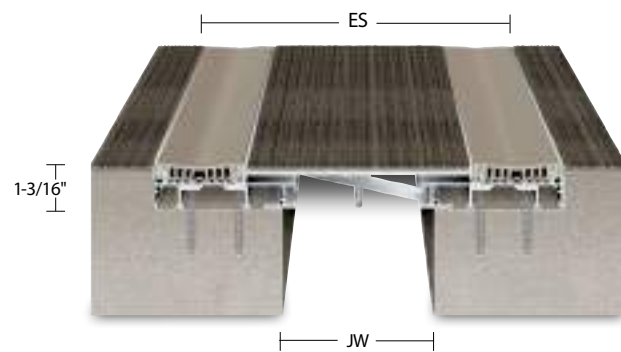
Dual gasketed flush covers offer added thermal movement for joints larger than 2" yet maintain a flush profile.



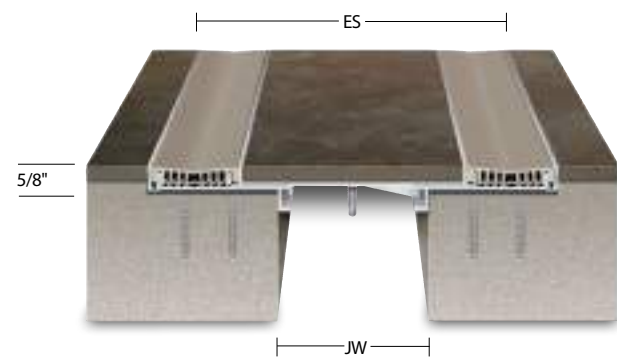
GTR



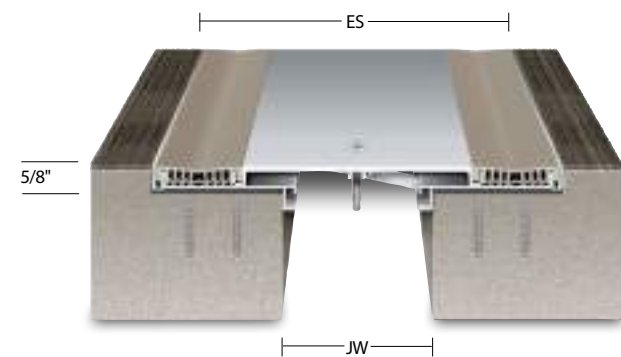
DGTR



GTRD



GTP



MODEL DATA

FLOOR TO FLOOR COVERS

JOINT WIDTH	2"	3"	4"	2"	3"	4"	2"	3"	4"
MINIMUM OPENING	1.25"	1.25"	2.25"	1.25"	1.25"	1.25"	1.25"	1.25"	1.25"
MAXIMUM OPENING	3.75"	6.00"	6.25"	3.75"	6.00"	6.25"	3.75"	6.00"	6.25"
EXPOSED SURFACE	6.50"	10.00"	11.00"	6.50"	10.00"	11.00"	6.50"	10.00"	11.00"
SPECIFY MODEL	GTR 200	GTR 300	GTR 400	DGTR 200	DGTR 300	DGTR 400	GTP 200	GTP 300	GTP 400

FLOOR TO WALL COVERS

JOINT WIDTH	2"	3"	4"	2"	3"	4"	2"	3"	4"
MINIMUM OPENING	1.00"	1.50"	2.50"	1.00"	1.50"	2.50"	1.00"	1.50"	2.50"
MAXIMUM OPENING	3.00"	4.50"	5.50"	3.00"	4.50"	5.50"	3.00"	4.50"	5.50"
EXPOSED SURFACE	4.25"	6.50"	7.50"	4.25"	6.50"	7.50"	4.25"	6.50"	7.50"
SPECIFY MODEL	GTRW 200	GTRW 300	GTRW 400	DGTRW 200	DGTRW 300	DGTRW 400	GTPW 200	GTPW 300	GTPW 400

GTRD and GTR have the same model data. For odd and larger sized joints, call 800.233.8493 or visit www.c-sgroup.com/ejc.

GASKET COLORS

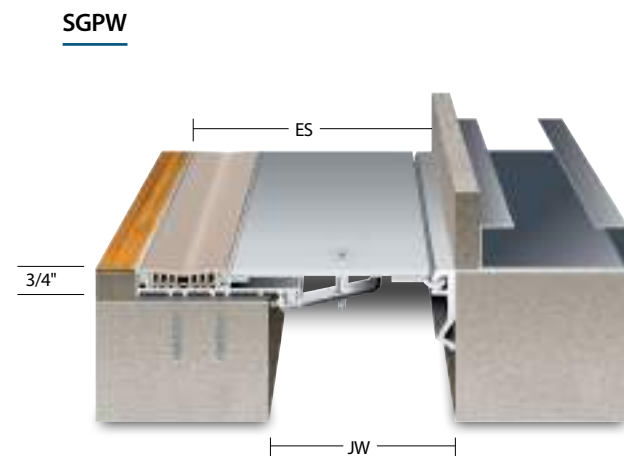
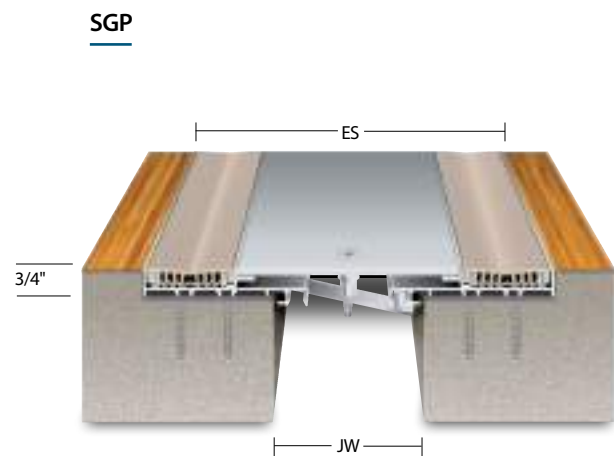
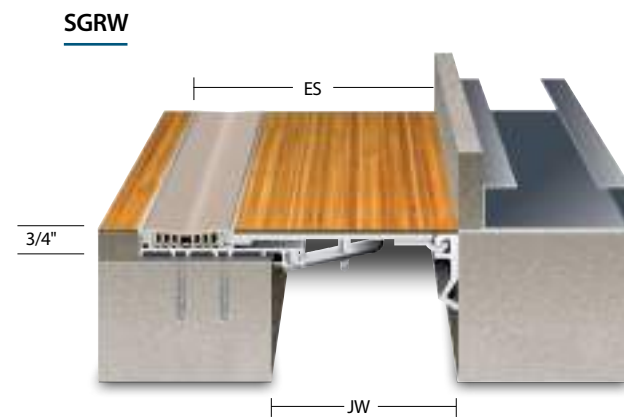
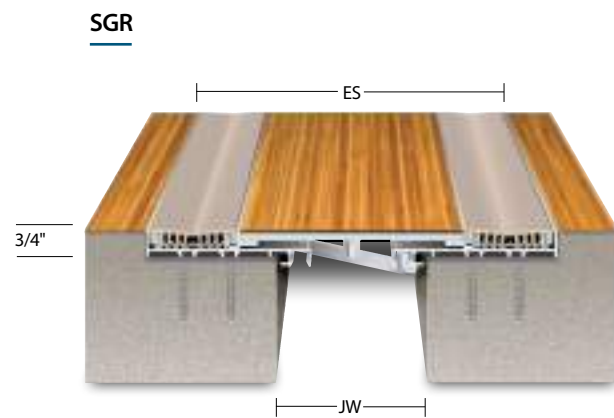
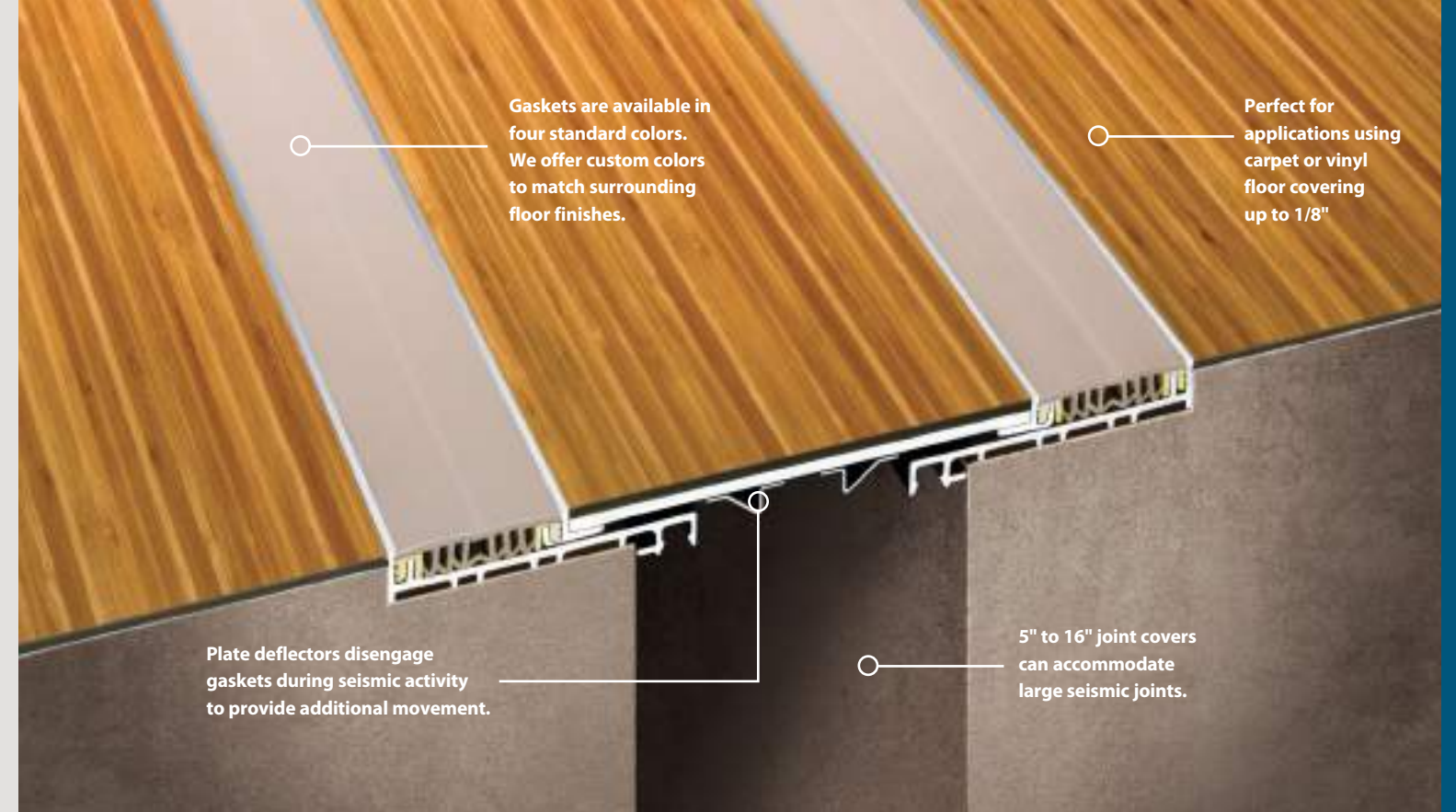


Note: Custom colors are available. Call 800.233.8493.

For comprehensive information on these products, visit www.c-sgroup.com/ejc.

Flush Seismic Floor Covers 5" and Up

Flush seismic covers are designed to perform during seismic movement and provide a smooth transition for joints larger than 5".



MODEL DATA

FLOOR TO FLOOR COVERS

JOINT WIDTH	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"
MINIMUM OPENING	2.75"	2.75"	2.75"	2.75"	2.75"	2.75"	2.75"	2.75"	2.75"	2.75"	2.75"	2.75"
MAXIMUM OPENING	9.25"	9.25"	12.25"	13.25"	14.13"	16.25"	18.13"	18.38"	21.25"	22.25"	22.75"	25.25"
EXPOSED SURFACE	12.00"	13.00"	15.00"	16.00"	18.00"	19.00"	21.00"	22.00"	24.00"	25.00"	27.00"	28.00"
SPECIFY MODEL	SGR 500	SGR 600	SGR 700	SGR 800	SGR 900	SGR 1000	SGR 1100	SGR 1200	SGR 1300	SGR 1400	SGR 1500	SGR 1600

FLOOR TO WALL COVERS

JOINT WIDTH	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"
MINIMUM OPENING	3.56"	4.06"	4.94"	5.44"	5.94"	6.44"	6.94"	7.44"	7.94"	8.44"	8.94"	9.44"
MAXIMUM OPENING	6.56"	7.75"	9.69"	10.63"	11.56"	13.13"	14.63"	15.25"	17.13"	18.13"	18.75"	20.63"
EXPOSED SURFACE	8.50"	9.50"	11.00"	12.00"	13.50"	14.50"	16.00"	17.00"	18.50"	19.50"	21.00"	20.00"
SPECIFY MODEL	SGRW 500	SGRW 600	SGRW 700	SGRW 800	SGRW 900	SGRW 1000	SGRW 1100	SGRW 1200	SGRW 1300	SGRW 1400	SGRW 1500	SGRW 1600

SGR and SGP have the same model data. SGRW and SGPW have the same model data. For odd and larger sized joints, call 800.233.8493 or visit www.c-sgroup.com/ejc.

GASKET COLORS



Note: Custom colors are available. Call 800.233.8493.

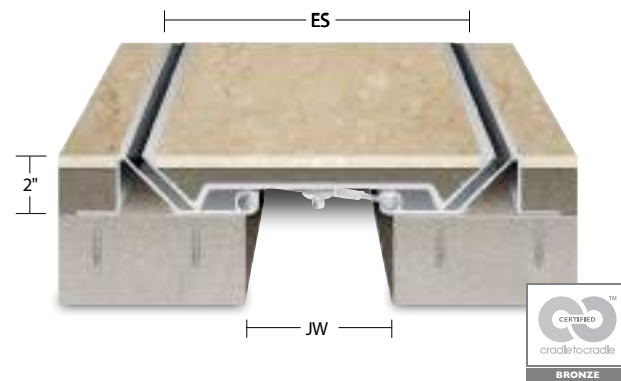
For comprehensive information on these products, visit www.c-sgroup.com/ejc.

Pan Seismic Floor Covers 2" and Up

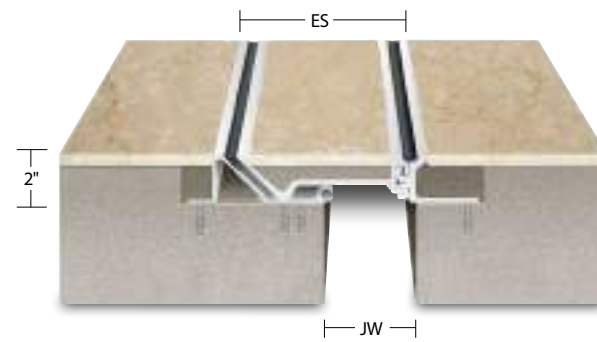
Virtually invisible seismic floor covers are used for interior and exterior applications. Designed to accept a variety of floor finishes, they handle multi-directional movement.



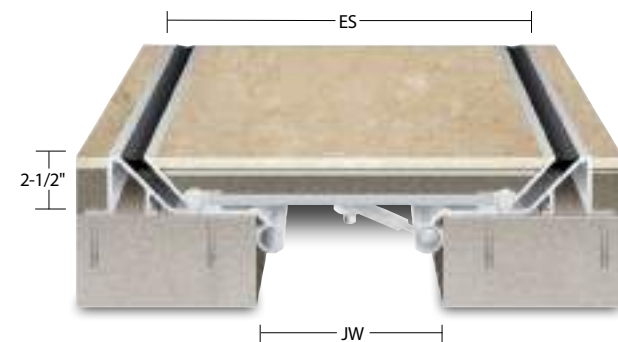
SSR-200-400



SSRH 200-400



SSR-500+



MODEL DATA

FLOOR TO FLOOR COVERS

JOINT WIDTH	2"	4"	6"	8"	10"	12"	14"	16"
MINIMUM OPENING	0.75"	1.50"	2.56"	4.00"	4.00"	4.00"	4.00"	4.00"
MAXIMUM OPENING	6.90"	8.50"	10.38"	13.13"	16.00"	18.88"	21.75"	24.75"
EXPOSED SURFACE	13.69"	13.69"	17.75"	20.75"	23.75"	26.75"	29.75"	32.75"
SPECIFY MODEL	SSR 200	SSR 400	SSR 600	SSR 800	SSR 1000	SSR 1200	SSR 1400	SSR 1600

FLOOR TO WALL COVERS

JOINT WIDTH	2"	4"	6"	8"	10"	12"	14"	16"
MINIMUM OPENING	1.00"	1.75"	1.06"	1.06"	1.06"	1.06"	1.06"	1.06"
MAXIMUM OPENING	4.00"	6.00"	10.00"	13.00"	16.00"	19.00"	22.00"	25.00"
EXPOSED SURFACE	7.88"	8.88"	13.69"	16.69"	19.69"	22.69"	25.69"	28.69"
SPECIFY MODEL	SSRW 200	SSRW 400	SSRW 600	SSRW 800	SSRW 1000	SSRW 1200	SSRW 1400	SSRW 1600

SSRH and SSRW have the same model data. For odd and larger sized joints, call 800.233.8493 or visit www.c-sgroup.com/ejc.

Construction Specialties, Inc. holds a patent(s) on one or more of the products listed herein. For detailed patent information, see www.c-sgroup.com/patents.

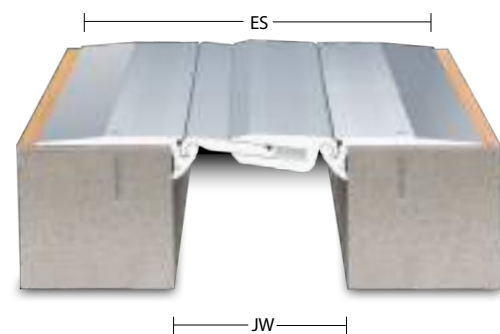
For comprehensive information on these products, visit www.c-sgroup.com/ejc.

Restofit™ Joint Systems

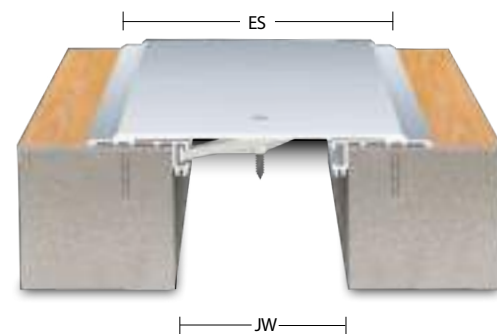
Restofit is designed for quick and easy installation in both new and retrofit applications and requires little maintenance. Models are suitable for a variety of floor finishes and provide minimal visual impact.



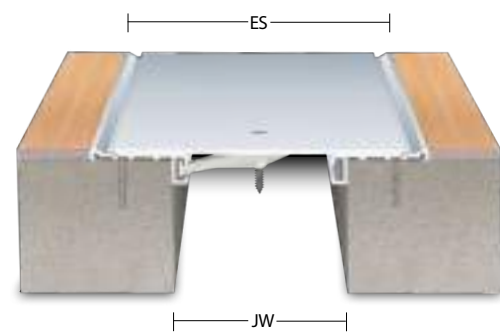
RFA



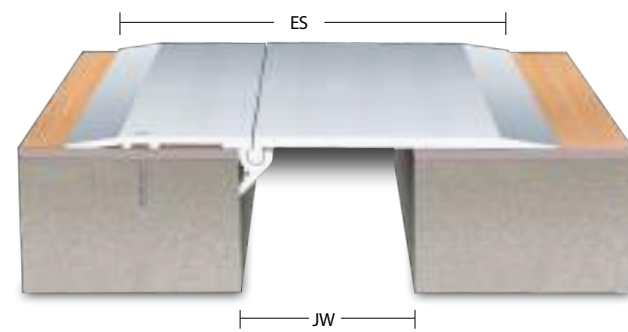
RFB



RFC



RFD



MODEL DATA

FLOOR TO FLOOR COVERS

JOINT WIDTH	2"	3"	4"	2"	3"	4"	2"	3"	4"	1"	2"	3"	4"	5"	6"	7"	8"
MINIMUM OPENING	1.75"	2.63"	3.38"	1.25"	1.25"	1.25"	1.25"	1.25"	1.25"	0.75"	0.75"	0.75"	0.75"	0.75"	0.75"	0.75"	0.75"
MAXIMUM OPENING	2.25"	3.38"	4.63"	4.00"	6.00"	7.00"	4.00"	6.00"	7.00"	2.00"	4.00"	6.00"	6.50"	8.00"	8.00"	11.00"	11.00"
EXPOSED SURFACE	8.25"	9.25"	10.25"	6.00"	7.00"	8.00"	5.75"	6.75"	7.75"	9.38"	9.38"	11.38"	11.38"	15.38"	15.38"	18.38"	18.38"
SPECIFY MODEL	RFA 200	RFA 300	RFA 400	RFB 200	RFB 300	RFB 400	RFC 200	RFC 300	RFC 400	RFD 100	RFD 200	RFD 300	RFD 400	RFD 500	RFD 600	RFD 700	RFD 800

FLOOR TO WALL COVERS

JOINT WIDTH	2"	3"	4"	2"	3"	4"	2"	3"	4"	1"	2"	3"	4"	5"	6"	7"	8"
MINIMUM OPENING	1.75"	2.63"	3.38"	0.38"	0.38"	0.38"	0.38"	0.38"	0.38"	0.75"	0.75"	0.75"	0.75"	0.75"	0.75"	0.75"	0.75"
MAXIMUM OPENING	2.25"	3.38"	4.63"	3.50"	4.50"	5.50"	3.50"	4.50"	5.50"	2.00"	4.00"	6.00"	6.50"	8.00"	8.00"	11.00"	11.00"
EXPOSED SURFACE	8.25"	6.13"	7.13"	4.00"	5.00"	6.00"	3.88"	4.88"	5.88"	5.38"	5.38"	7.38"	7.38"	10.75"	10.75"	13.75"	13.75"
SPECIFY MODEL	RFA 200	RFA 300	RFA 400	RFB 200	RFB 300	RFB 400	RFC 200	RFC 300	RFC 400	RFD 100	RFD 200	RFD 300	RFD 400	RFD 500	RFD 600	RFD 700	RFD 800

For odd and larger sized joints, call 800.233.8493 or visit www.c-sgroup.com/ejc.

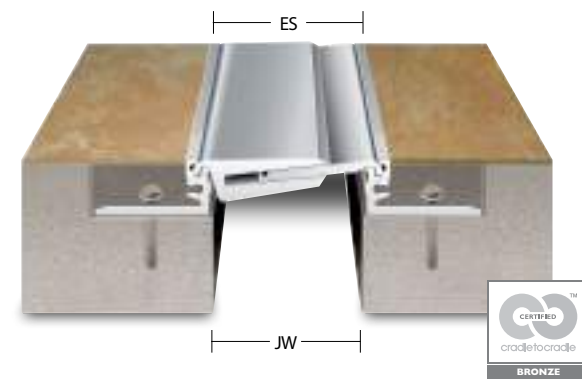
For comprehensive information on these products, visit www.c-sgroup.com/ejc.

Standard Allway™ Metal Floor Covers 1"- 4"

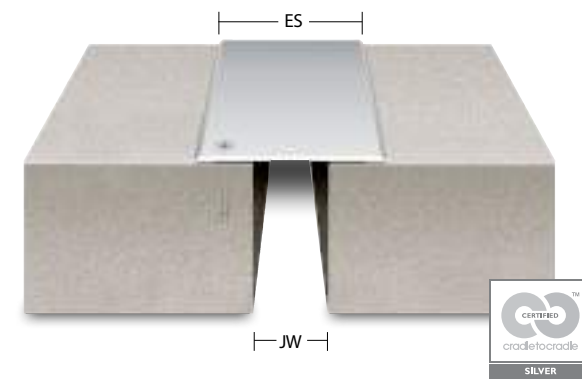
Designed to hold up in applications with high traffic, our Allway covers work with most floor finishes and require little maintenance.



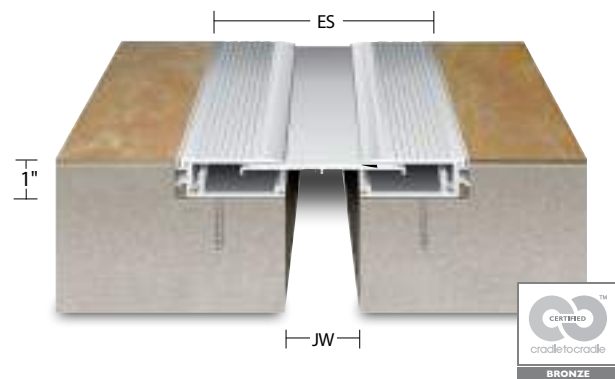
APF



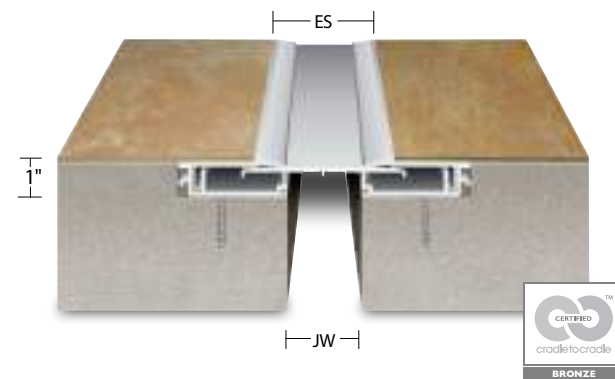
PC



ALS



ALR



MODEL DATA

FLOOR TO FLOOR COVERS

JOINT WIDTH	1"	2"	3"	4"	2"	4"	2"	4"	2"	4"
MINIMUM OPENING	0.75"	1.63"	2.50"	3.25"	0.00"	0.88"	0.00"	0.88"	0.00"	0.00"
MAXIMUM OPENING	1.25"	2.38"	3.50"	4.75"	4.00"	7.00"	4.00"	7.00"	3.75"	6.75"
EXPOSED SURFACE	1.70"	3.30"	4.37"	5.28"	3.65"	6.44"	7.75"	11.75"	5.25"	8.25"
SPECIFY MODEL	APF 100	APF 200	APF 300	APF 400	ALR 200	ALR 400	ALS 200	ALS 400	PC 200	PC 400

FLOOR TO WALL COVERS

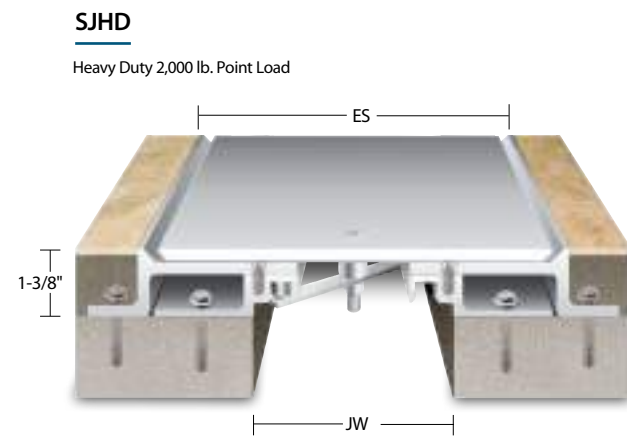
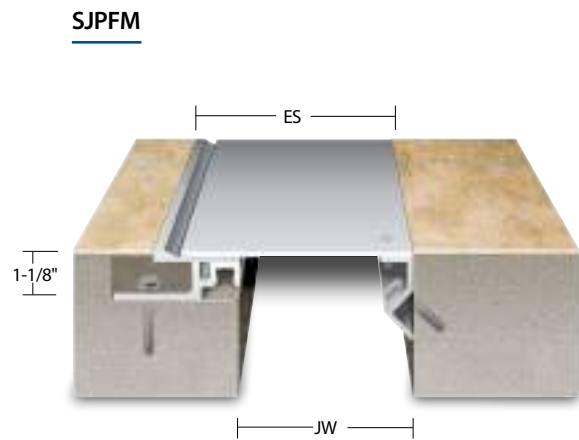
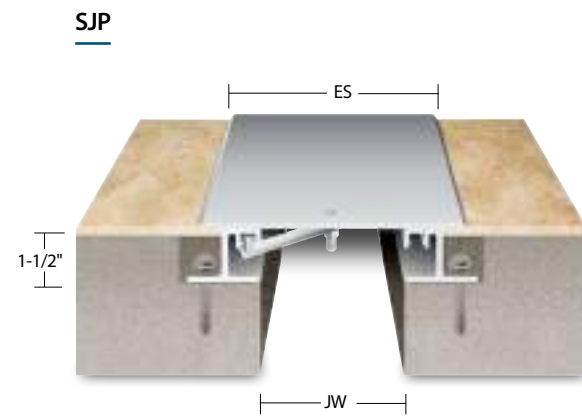
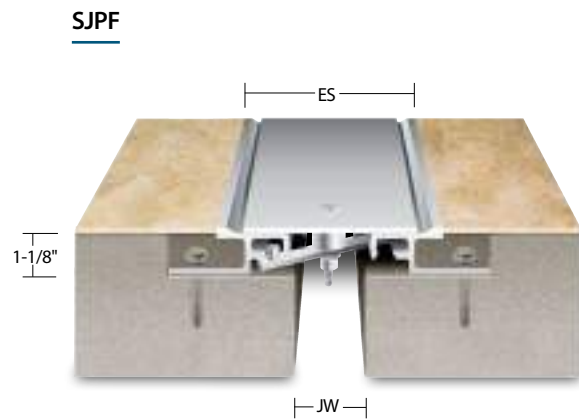
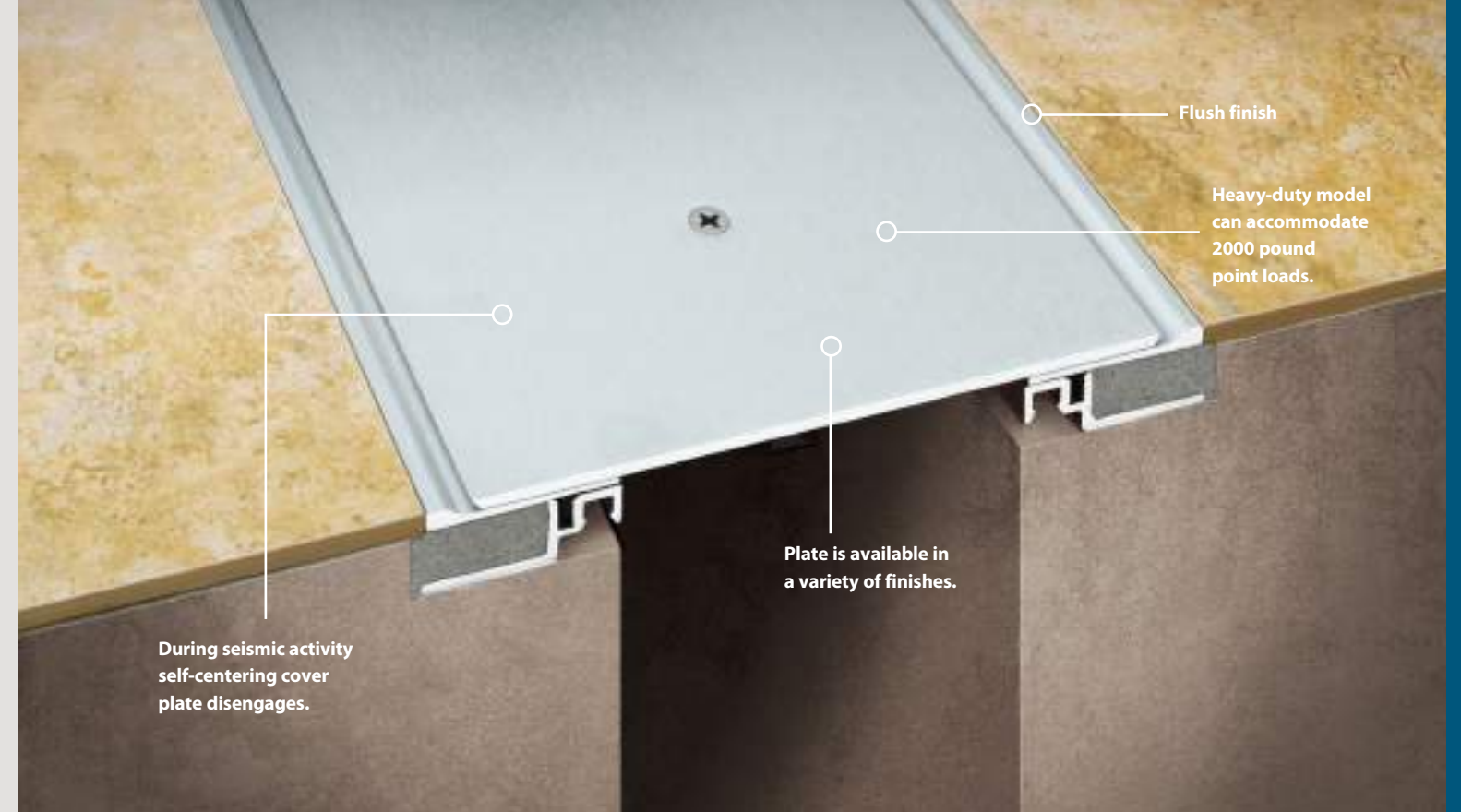
JOINT WIDTH	1"	2"	3"	4"	2"	4"	2"	4"	2"	4"
MINIMUM OPENING	0.75"	1.63"	2.50"	3.25"	1.00"	2.44"	1.00"	2.44"	0.00"	0.00"
MAXIMUM OPENING	1.25"	2.38"	3.50"	4.75"	3.00"	5.50"	3.00"	5.50"	3.75"	6.75"
EXPOSED SURFACE	1.70"	3.30"	4.37"	5.28"	2.81"	5.19"	4.88"	7.88"	3.75"	6.75"
SPECIFY MODEL	APFW 100	APFW 200	APFW 300	APFW 400	ALRW 200	ALRW 400	ALSW 200	ALSW 400	PCW 200	PCW 400

For odd and larger sized joints, call 800.233.8493 or visit www.c-sgroup.com/ejc.

For comprehensive information on these products, visit www.c-sgroup.com/ejc.

Seismic Allway™ Metal Floor Covers 4" and Up

Interior and exterior seismic metal covers are designed to provide multi-directional movement while remaining flush during thermal movement. A heavy-duty model is available for heavy point loads.



MODEL DATA

FLOOR TO FLOOR COVERS

JOINT WIDTH	4"	6"	8"	2"	4"	6"	2"	4"	6"	8"	10"	12"	14"	16"
MINIMUM OPENING	2.75"	2.75"	2.75"	1.00"	1.00"	1.00"	1.00"	1.00"	1.00"	1.00"	1.00"	1.00"	1.00"	1.00"
MAXIMUM OPENING	6.36"	9.25"	13.50"	4.00"	6.50"	9.88"	4.50"	7.50"	11.13"	14.25"	16.75"	21.00"	23.75"	24.25"
EXPOSED SURFACE	8.75"	11.75"	14.75"	5.50"	8.00"	11.50"	4.50"	7.50"	11.88"	15.00"	18.00"	21.00"	24.00"	27.00"
SPECIFY MODEL	SJ400HD	SJ600HD	SJ800HD	SJPF 200	SJPF 400	SJPF 600	SJP 200	SJP 400	SJP 600	SJP 800	SJP 1000	SJP 1200	SJP 1400	SJP 1600

FLOOR TO WALL COVERS

JOINT WIDTH	4"	6"	8"	2"	4"	6"	2"	4"	6"	8"	10"	12"	14"	16"
MINIMUM OPENING	1.00"	1.00"	5.38"	0.00"	0.00"	0.00"	0.00"	0.00"	0.00"	4.50"	5.50"	6.50"	7.50"	8.50"
MAXIMUM OPENING	6.32"	8.82"	11.04"	3.00"	5.25"	7.94"	3.25"	5.75"	8.50"	10.00"	13.31"	16.50"	18.75"	20.00"
EXPOSED SURFACE	6.38"	8.88"	11.38"	3.75"	6.00"	8.75"	3.25"	5.75"	8.94"	11.50"	14.00"	16.50"	19.00"	21.50"
SPECIFY MODEL	SJW400HD	SJW600HD	SJW800HD	SJPFW 200	SJPFW 400	SJPFW 600	SJPW 200	SJPW 400	SJPW 600	SJPW 800	SJPW 1000	SJPW 1200	SJPW 1400	SJPW 1600

SJPFM and SJPFW have the same model data. For odd and larger sized joints, call 800.233.8493 or visit www.c-sgroup.com/ejc.

For comprehensive information on these products, visit www.c-sgroup.com/ejc.

Seismic Corridor Covers for Base Isolated Structures

Because base isolated structures are free to move in any direction, they create distinct challenges for the design of the seismic joint covers. Our solution is an integrated assembly where floor, wall and ceiling covers are connected and move in unison. The MACC System, or cab assembly, provides multi-directional movement of up to 100% in four directions. The floor cover may be used independently of the wall and ceiling covers for lineal applications where lateral shear is a problem. (Specify model XYZ.)

COVER DETAILS

Unique honeycomb structure supports the plate throughout movement cycle.

Product also available as a conventional lineal cover, model XYZ.



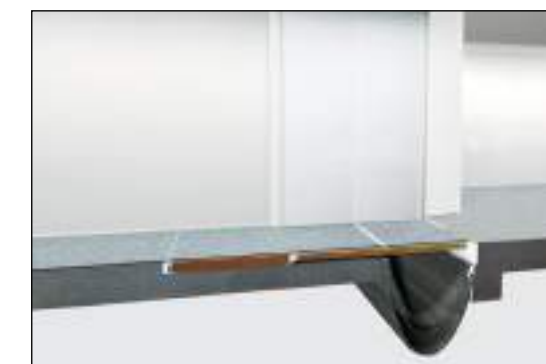
Typical Floor Section



Floor/Wall Section

- OSHPD-approved designs
- Complies with ASTM E1399
- Complimentary pre-construction design assistance
- Fire rating available; compliant with UL 2079
- Wide range of custom finishes available
- Virtually any joint size/movement capability can be accommodated.

HOW THE MACC SYSTEM WORKS



Full Open (During Tension) During an event, the MACC system slides out fully in the expansion (or tension) mode.



Full Closed (During Compression) During an event, the MACC system slides fully into the adjoining structure in the contraction (or compression) mode.

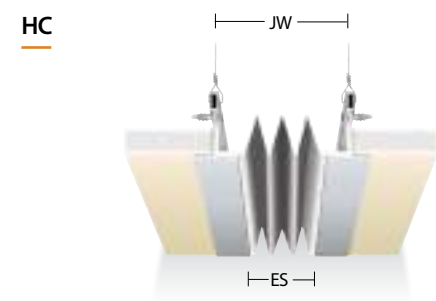
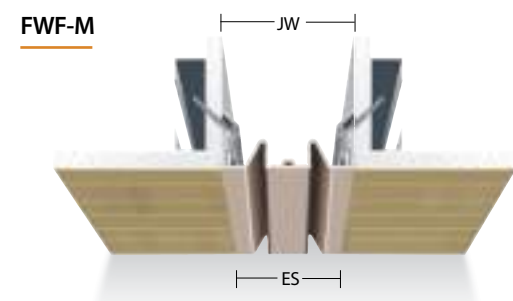
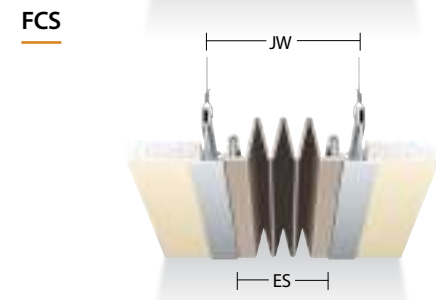
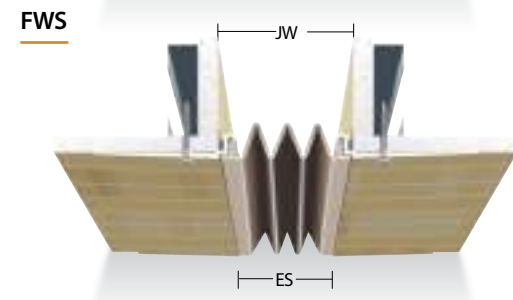
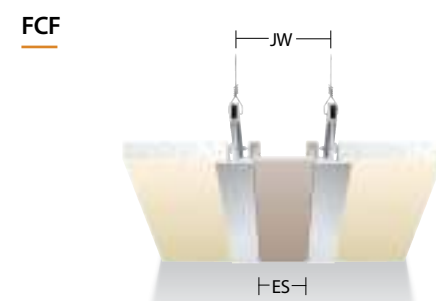
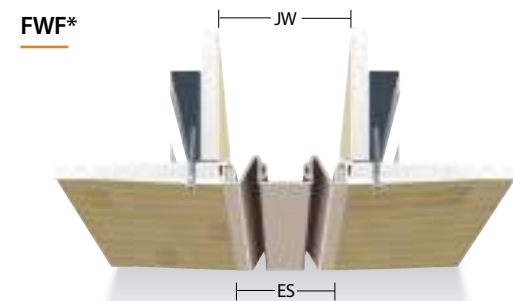
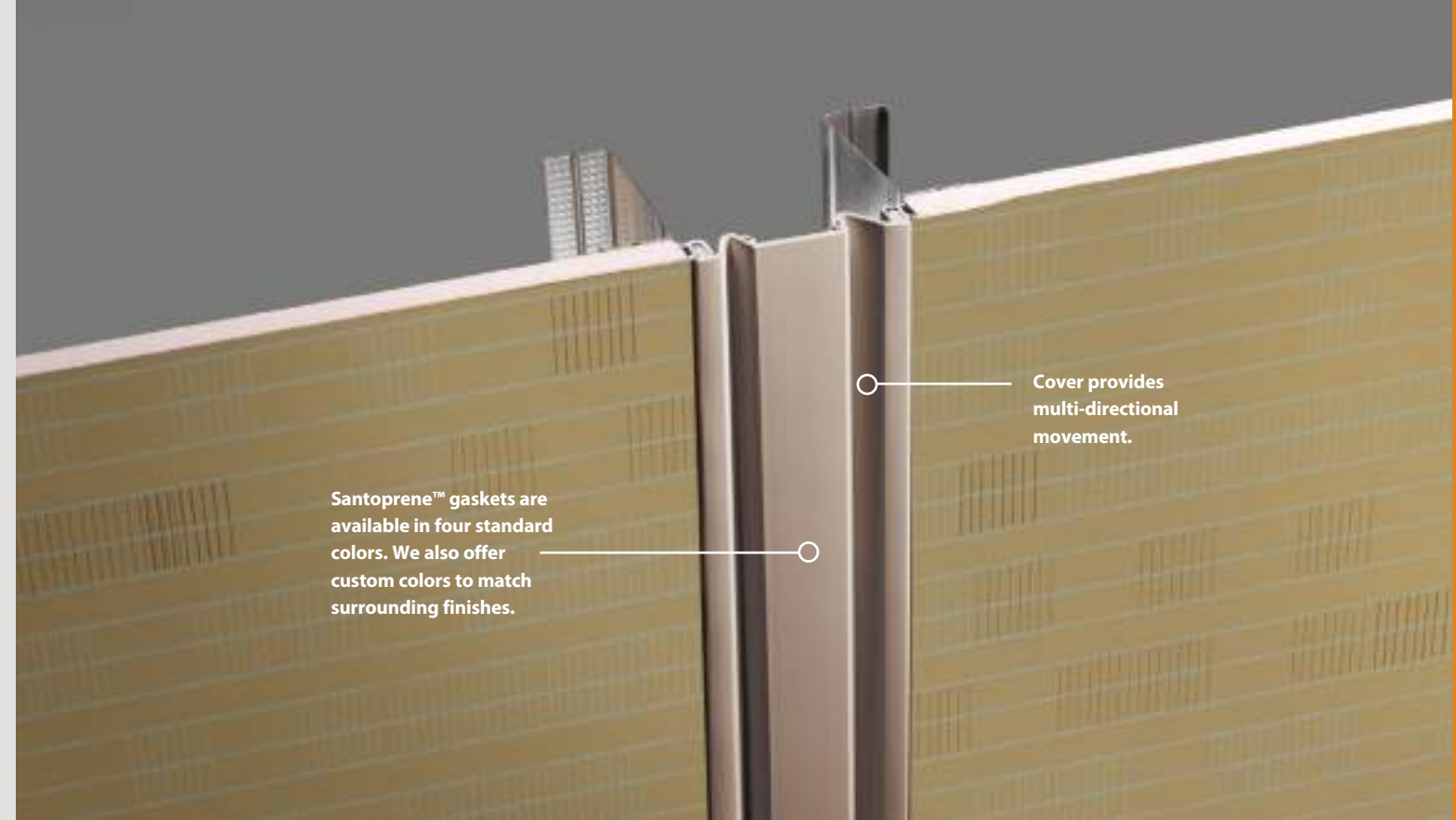


Project: De Young Museum
Architects: Fong & Chan Architects | Herzog & de Meuron
Products: XLS Exterior Wall Covers, MACC Multi-Axial Corridor Cover System

The project team utilized advanced strategies to design the DeYoung Museum, located five miles from the San Andreas Fault. The MACC systems allow the corridors on the base isolated building to move up to 42" in any direction during a seismic event. The 60" wide custom covers are filled with the same unique, copper cladding as the rest of the building, which provides a seamless appearance to the façade.

Flush Thinline Wall and Ceiling Covers 1"-10"

These flush gasketed wall and ceiling covers are designed to align with our flush gasketed floor covers. These covers are suitable for most wall and ceiling finishes and are unobtrusive.



Optional ribbed gaskets provide greater movement (models FWS, FCS and HC).

MODEL DATA

WALL TO WALL COVERS

JOINT WIDTH	1"	2"	3"	4"	2"	3"	4"
MINIMUM OPENING	0.60"	0.60"	1.25"	1.25"	1.25"	1.25"	1.25"
MAXIMUM OPENING	1.25"	2.50"	4.50"	6.00"	4.00"	6.00"	8.00"
EXPOSED SURFACE	1.06"	2.06"	3.00"	4.00"	2.00"	3.00"	4.00"
SPECIFY MODEL	FWF 100	FWF 200	FWF 300	FWF 400	FWS 200	FWS 300	FWS 400

CEILING COVERS

1"	2"	3"	4"	2"	3"	4"
0.60"	0.60"	1.25"	1.25"	1.25"	1.25"	1.25"
1.25"	2.50"	4.50"	6.00"	4.00"	6.00"	8.00"
0.81"	1.63"	3.00"	4.00"	2.00"	3.00"	4.00"
FCF 100	FCF 200	FCF 300	FCF 400	FCS 200	FCS 300	FCS 400

CORNER WALL COVERS

JOINT WIDTH	1"	2"	3"	4"	2"	3"	4"
MINIMUM OPENING	0.75"	0.75"	1.25"	1.25"	1.25"	1.25"	1.25"
MAXIMUM OPENING	1.25"	2.50"	4.50"	6.00"	4.00"	6.00"	8.00"
EXPOSED SURFACE	1.06"	2.06"	3.00"	4.00"	2.00"	3.00"	4.00"
SPECIFY MODEL	FWFC 100	FWFC 200	FWFC 300	FWFC 400	FWSC 200	FWSC 300	FWSC 400

CORNER CEILING COVERS

1"	2"	3"	4"	2"	3"	4"
0.75"	0.75"	1.25"	1.25"	1.25"	1.25"	1.25"
1.25"	2.50"	4.50"	6.00"	4.00"	6.00"	8.00"
1.00"	1.75"	3.00"	4.00"	2.00"	3.00"	4.00"
FCFC 100	FCFC 200	FCFC 300	FCFC 400	FCSC 200	FCSC 300	FCSC 400

FWF-M, FWF and FWFC have the same model data. HC and FCS have the same model data. For odd and larger sized joints, call 800.233.8493 or visit www.c-sgroup.com/ejc.

GASKET COLORS

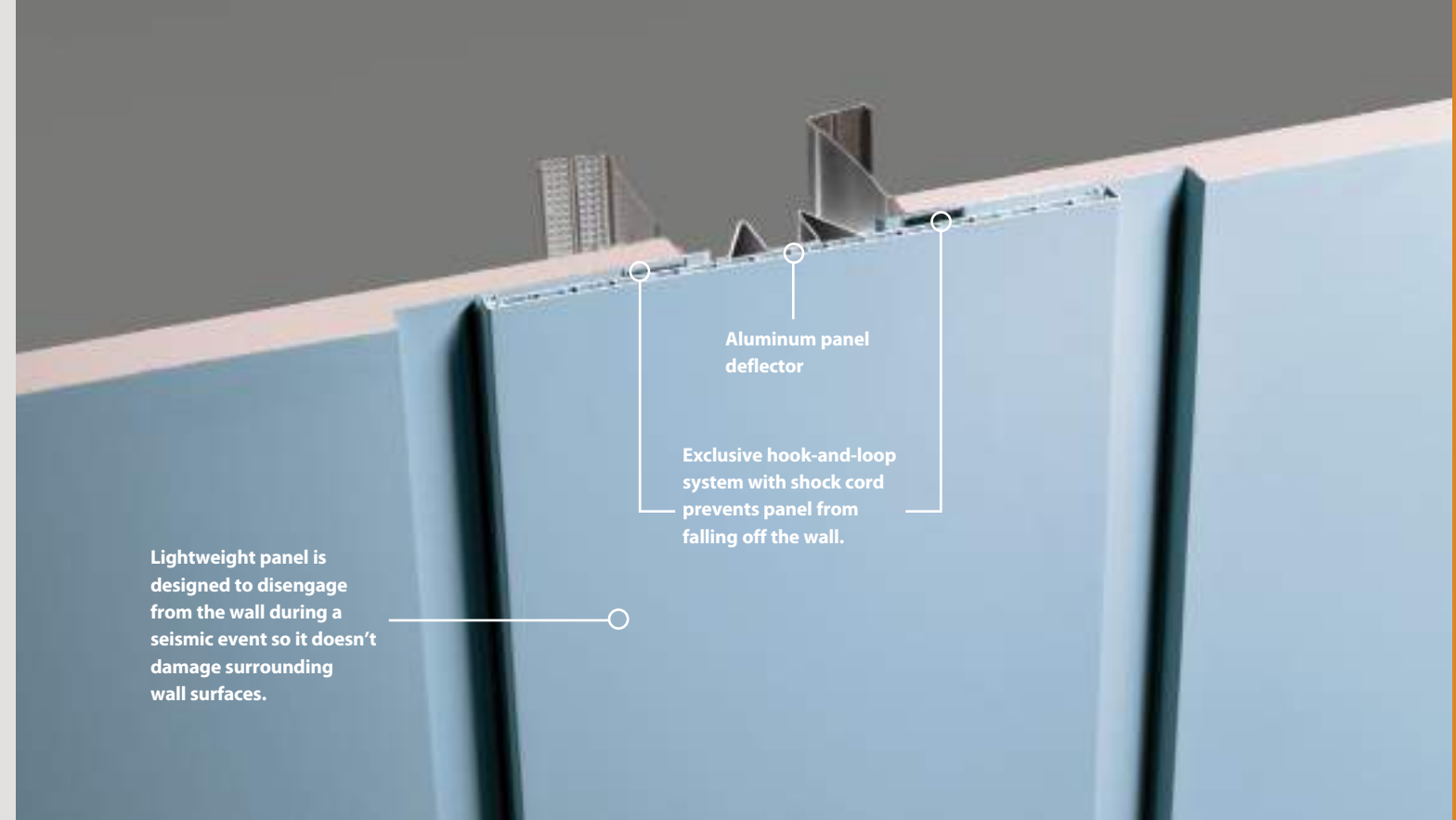


Note: Custom colors are available. Call 800.233.8493.
*For more available models see our website.

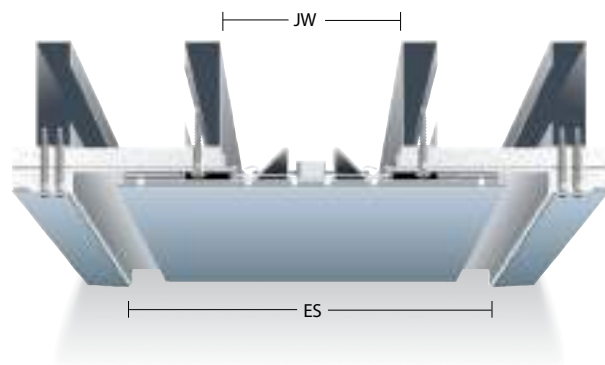
For comprehensive information on these products, visit www.c-sgroup.com/ejc.

Flush Twinline Wall and Ceiling Covers 2" and Up

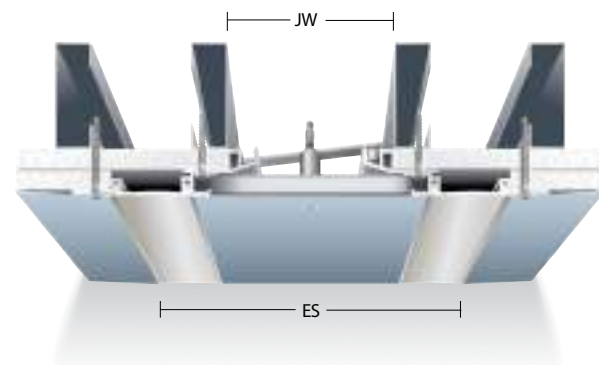
Twinline wall and ceiling covers are designed to allow for greater ranges of movement while maintaining a seamless look.



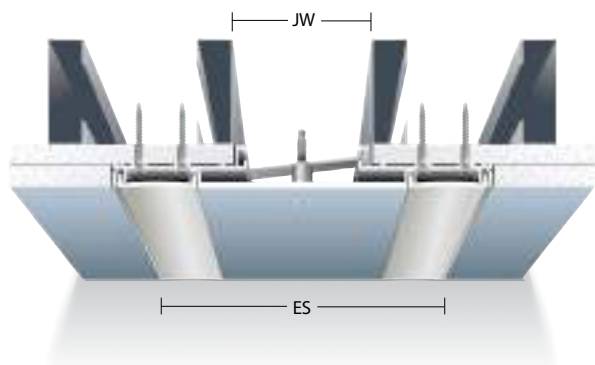
LAF



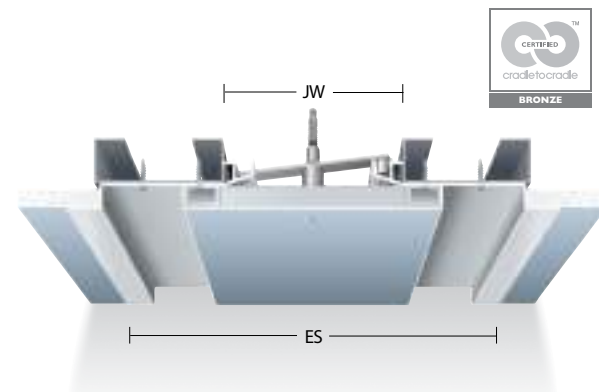
SGW



GTW



SGC



MODEL DATA

WALL TO WALL COVERS

JOINT WIDTH	2"	4"	6"	8"	10"	12"	14"	16"	4"	6"	8"	10"	12"	14"	16"
MINIMUM OPENING	1.25"	1.25"	2.75"	2.75"	2.75"	2.75"	2.75"	2.75"	1.00"	1.00"	1.00"	1.00"	1.00"	1.00"	1.00"
MAXIMUM OPENING	3.75"	6.25"	9.25"	12.75"	15.75"	18.75"	21.75"	24.75"	8.00"	12.00"	16.00"	20.00"	24.00"	28.00"	32.00"
EXPOSED SURFACE	6.50"	11.00"	13.00"	16.00"	19.00"	22.00"	25.00"	28.00"	14.31"	16.31"	18.31"	20.31"	22.31"	24.31"	26.31"
SPECIFY MODEL	GTW 200	GTW 400	SGW 600	SGW 800	SGW 1000	SGW 1200	SGW 1400	SGW 1600	LAF 400	LAF 600	LAF 800	LAF 1000	LAF 1200	LAF 1400	LAF 1600

CORNER WALL COVERS

JOINT WIDTH	2"	4"	6"	8"	10"	12"	14"	16"	4"	6"	8"	10"	12"	14"	16"
MINIMUM OPENING	1.00"	2.50"	4.25"	5.50"	6.50"	7.50"	8.50"	9.50"	2.50"	2.50"	2.50"	2.50"	2.50"	2.50"	2.50"
MAXIMUM OPENING	3.00"	5.50"	7.50"	10.25"	12.75"	15.25"	17.75"	20.25"	8.00"	12.00"	16.00"	20.00"	24.00"	28.00"	32.00"
EXPOSED SURFACE	4.25"	7.50"	9.50"	12.00"	14.50"	17.00"	19.50"	22.00"	9.13"	11.13"	13.13"	15.13"	17.13"	19.13"	21.13"
SPECIFY MODEL	GTWC 200	GTWC 400	SGWC 600	SGWC 800	SGWC 1000	SGWC 1200	SGWC 1400	SGWC 1600	L AFC 400	L AFC 600	L AFC 800	L AFC 1000	L AFC 1200	L AFC 1400	L AFC 1600

SGC and SGW have the same model data. For odd and larger sized joints, call 800.233.8493 or visit www.c-sgroup.com/ejc.

GASKET COLORS

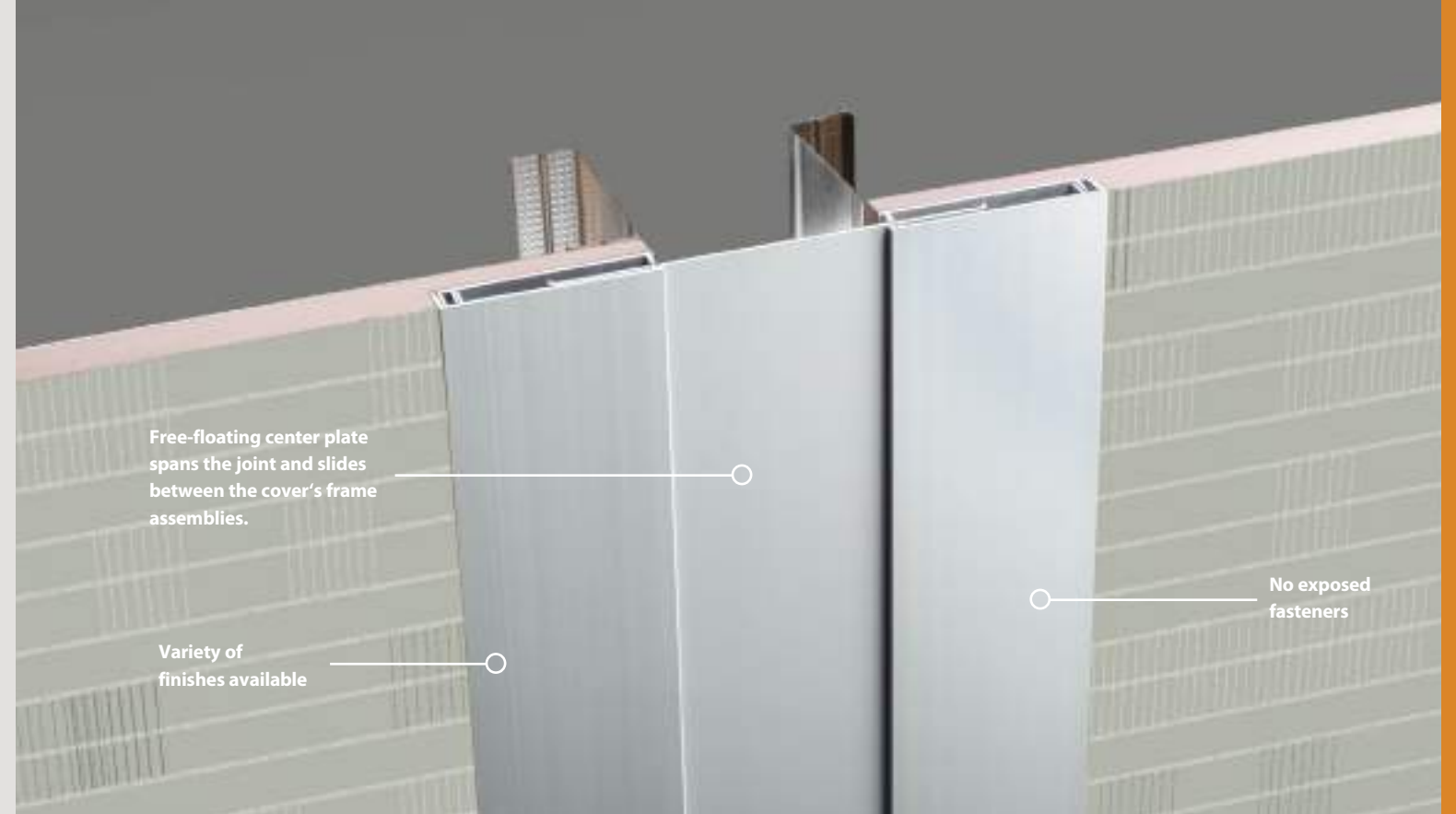


Note: Custom colors are available. Call 800.233.8493.

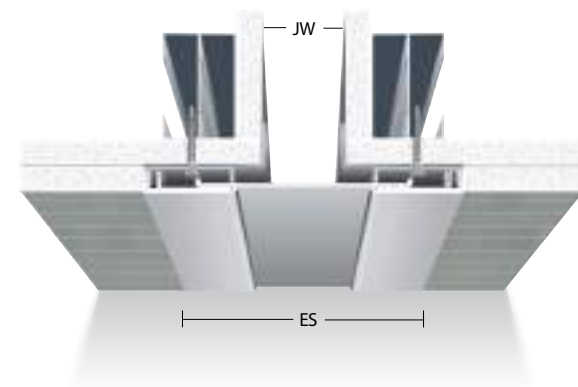
For comprehensive information on these products, visit www.c-sgroup.com/ejc.

Allway™ Metal Wall and Ceiling Covers 1" and Up

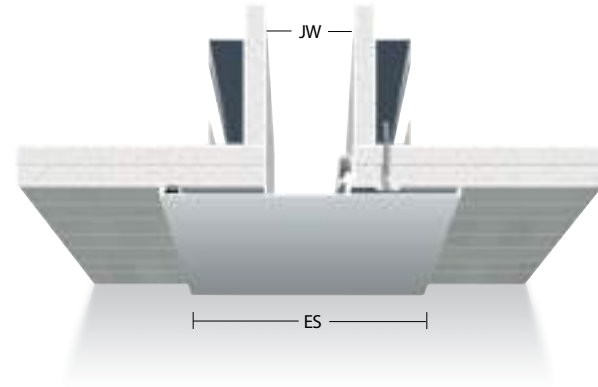
These metal covers for interior applications are designed as durable options in high use areas.



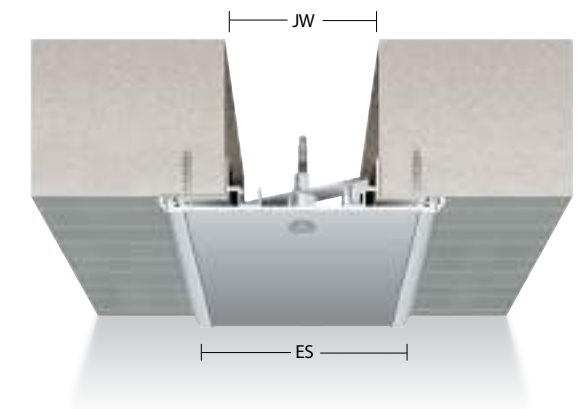
AFW



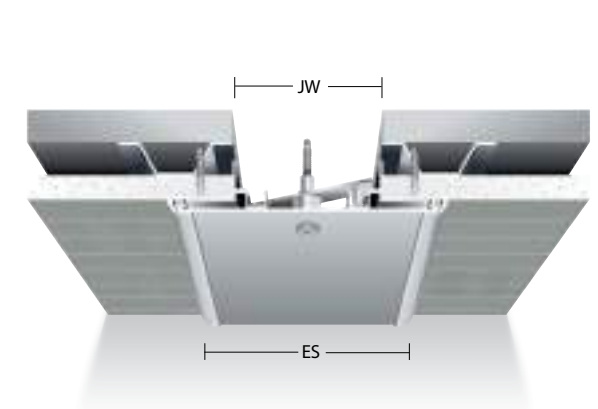
ASM



SFW



SFC



MODEL DATA

WALL TO WALL COVERS

JOINT WIDTH	1"	2"	3"	4"	1"	2"	3"	4"	4"	8"	12"	16"
MINIMUM OPENING	0.25"	0.38"	0.00"	1.00"	0.38"	0.38"	0.38"	0.38"	2.88"	2.88"	2.88"	2.88"
MAXIMUM OPENING	1.88"	3.50"	6.38"	7.38"	1.50"	3.00"	6.00"	6.00"	7.25"	14.13"	18.50"	25.88"
EXPOSED SURFACE	5.00"	7.75"	10.75"	11.75"	3.13"	4.63"	7.63"	7.63"	7.50"	15.00"	21.00"	27.00"
SPECIFY MODEL	AFW 100	AFW 200	AFW 300	AFW 400	ASM 100	ASM 200	ASM 300	ASM 400	SFW 400	SFW 800	SFW 1200	SFW 1600

CORNER WALL COVERS

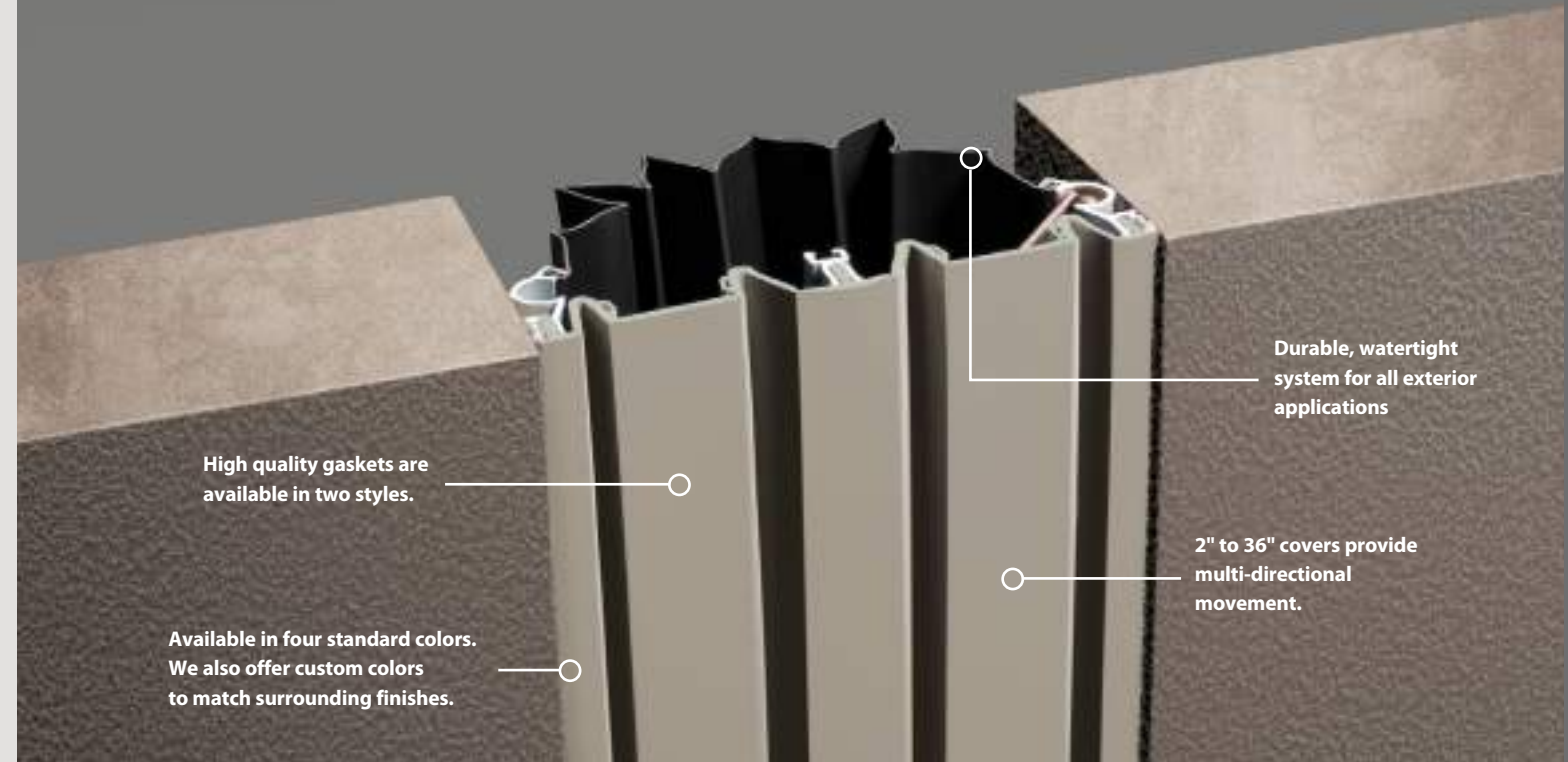
JOINT WIDTH	1"	2"	3"	4"	1"	2"	3"	4"	4"	8"	12"	16"
MINIMUM OPENING	0.63"	1.19"	1.50"	2.50"	0.50"	0.50"	0.50"	0.50"	0.00"	5.44"	7.44"	9.44"
MAXIMUM OPENING	1.44"	2.75"	4.69"	5.69"	1.50"	3.00"	6.00"	6.00"	5.50"	11.06"	15.25"	19.44"
EXPOSED SURFACE	2.38"	4.25"	6.25"	7.25"	1.88"	3.38"	6.38"	6.38"	5.75"	11.50"	16.25"	21.50"
SPECIFY MODEL	AFWC 100	AFWC 200	AFWC 300	AFWC 400	ASMC 100	ASMC 200	ASMC 300	ASMC 400	SCW 400	SCW 800	SCW 1200	SCW 1600

SFC and SFW have the same model data. For odd and larger sized joints, call 800.233.8493 or visit www.c-sgroup.com/ejc.
 Note: additional wall and ceiling cover models SFW and SFC are available. Go to www.c-sgroup.com/ejc.

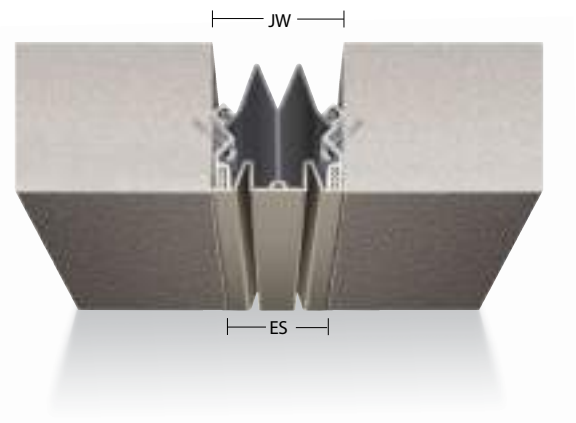
For comprehensive information on these products, visit www.c-sgroup.com/ejc.

Exterior Wall Flexible Seals 2" and Up

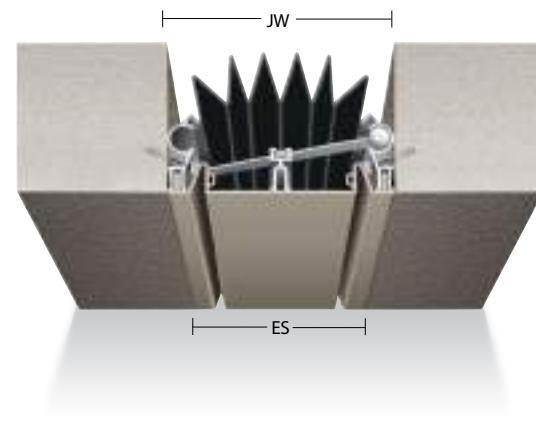
Our exterior flexible seals are designed for vertical applications where weather protection is critical.



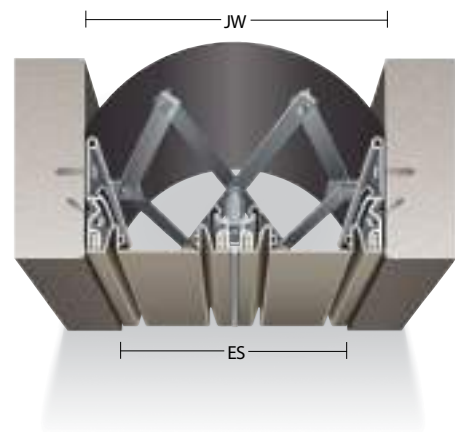
SF-300



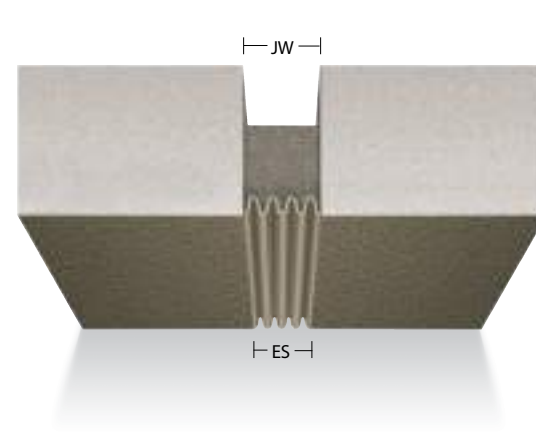
SF-800



SF-1200



VF



MODEL DATA

EXTERIOR WALL COVERS

JOINT WIDTH	2"	3"	4"	5"	6"	7"	8"	9"	10"	12"	14"	16"	1.0"	2.0"	3.0"	4.0"	6.0"	8.0"
MINIMUM OPENING	1.25"	1.25"	1.25"	1.25"	1.75"	2.50"	2.50"	2.50"	2.50"	6.00"	6.00"	6.00"	0.50"	1.00"	1.50"	2.00"	3.00"	4.00"
MAXIMUM OPENING	3.00"	4.50"	6.00"	7.50"	9.00"	10.50"	12.00"	13.50"	15.00"	18.00"	21.00"	24.00"	1.50"	3.00"	4.50"	6.00"	9.00"	12.00"
EXPOSED SURFACE	2.00"	3.00"	4.00"	5.00"	6.00"	7.00"	8.00"	9.00"	10.00"	12.00"	14.00"	16.00"	1.00"	2.00"	3.00"	4.00"	6.00"	8.00"
SPECIFY MODEL	SF 200	SF 300	SF 400	SF 500	SF 600	SF 700	SF 800	SF 900	SF 1000	SF 1200	SF 1400	SF 1600	VF 100	VF 200	VF 300	VF 400	VF 600	VF 800

EXTERIOR WALL COVERS

JOINT WIDTH	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"
MINIMUM OPENING	1.25"	1.75"	1.75"	2.50"	2.50"	2.50"	2.50"	6.00"	6.00"	6.00"	6.00"	6.00"	6.00"
MAXIMUM OPENING	8.00"	10.00"	12.00"	14.00"	16.00"	18.00"	20.00"	22.00"	24.00"	26.00"	28.00"	30.00"	32.00"
EXPOSED SURFACE	4.00"	5.00"	6.00"	7.00"	8.00"	9.00"	10.00"	11.00"	12.00"	13.00"	14.00"	15.00"	16.00"
SPECIFY MODEL	SC 400	SC 500	SC 600	SC 700	SC 800	SC 900	SC 1000	SC 1100	SC 1200	SC 1300	SC 1400	SC 1500	SC 1600

For odd and larger sized joints, call 800.233.8493 or visit www.c-sgroup.com/ejc.
Factory fabricated transitions are available

STANDARD VF COLORS

White	Precast White	Limestone	Gray	Natural Stone	Sandstone	Dusty Rose
Adobe Tan	Rustic Brick	Blue Spruce	Rustic Brick	Charcoal	Bronze	Black

STANDARD GASKET COLORS

White	Greige	Gray	Black
-------	--------	------	-------

PREMIUM GASKET COLORS

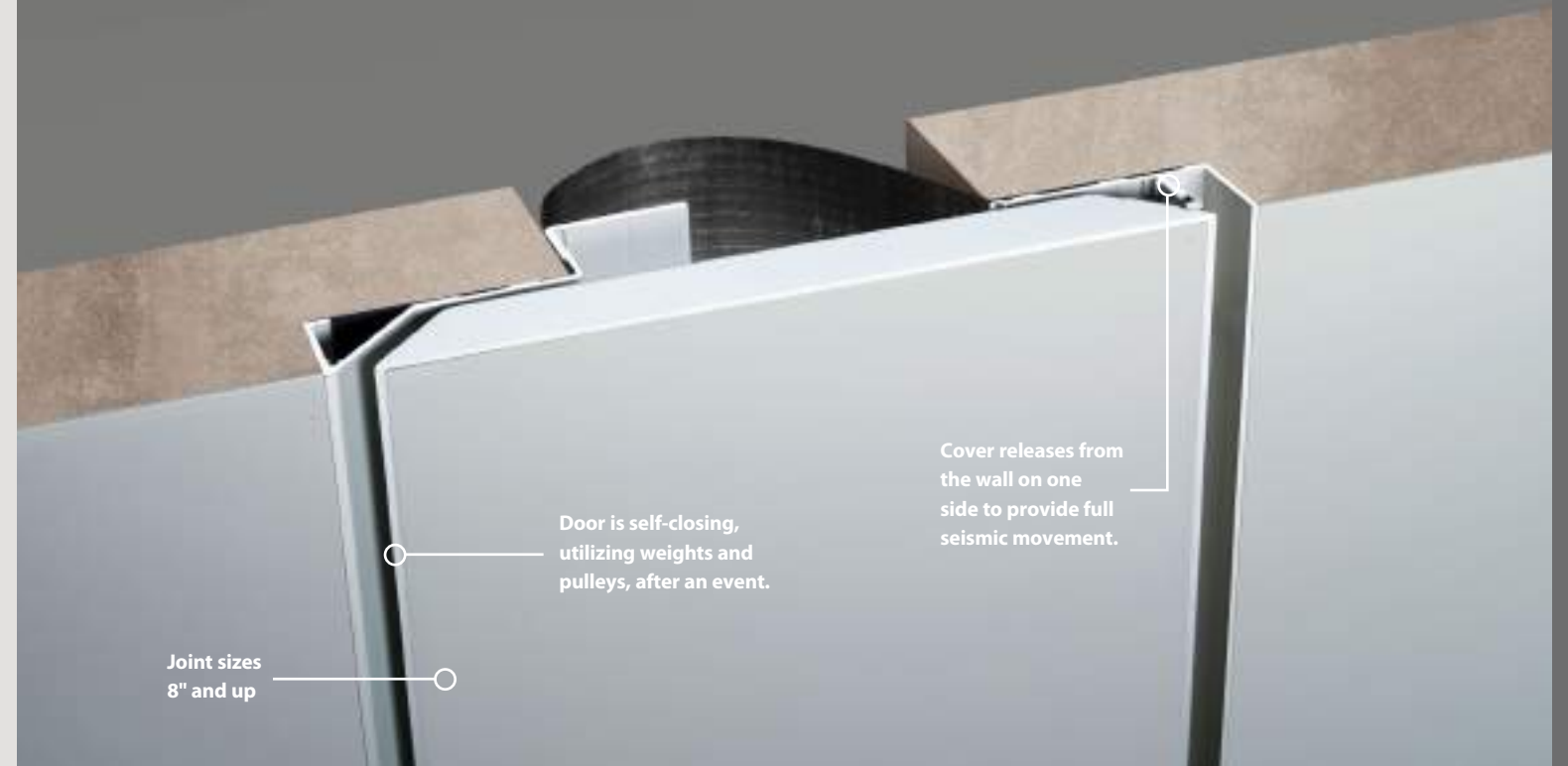
Platinum

Note: Custom colors are available. Call 800.233.8493.

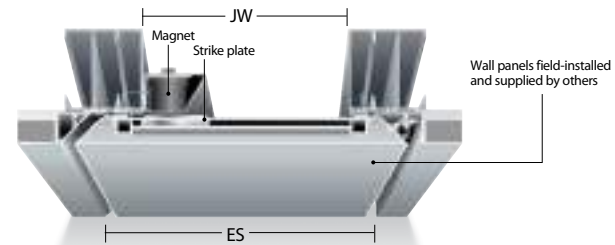
For comprehensive information on these products, visit www.c-sgroup.com/ejc.

Seismic Exterior Wall Covers 8" and Up

Seismic exterior wall covers allow high ranges of movement while blending with exterior finishes for an unobtrusive look.



XLS



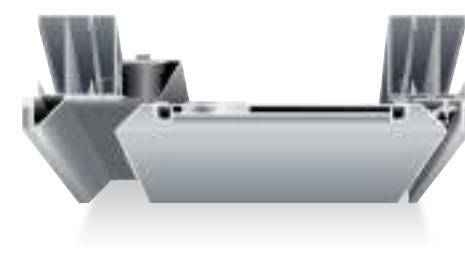
XLS Contracted

Counterweight cord (magnet not shown)

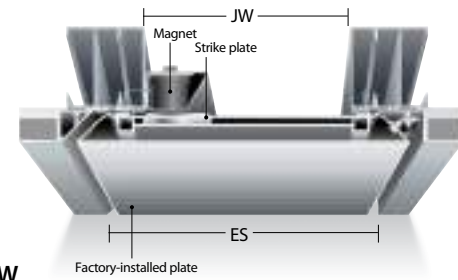


XLS Expanded

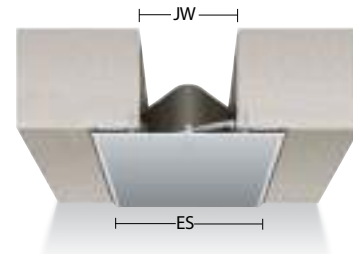
Magnet (counterweight cord not shown)



XLP



ESW



MODEL DATA

EXTERIOR WALL TO WALL COVERS

JOINT WIDTH	8"	10"	12"	14"	16"	4"	8"	12"	16"
MINIMUM OPENING	4.00"	4.00"	4.00"	4.00"	4.00"	2.50"	2.50"	2.50"	2.50"
MAXIMUM OPENING	16.00"	20.00"	24.00"	28.00"	32.00"	6.00"	13.00"	19.00"	25.00"
EXPOSED SURFACE	17.31"	19.31"	21.31"	23.31"	25.31"	12.00"	18.00"	24.00"	30.00"
SPECIFY MODEL	XLS/XLP 800	XLS/XLP 1000	XLS/XLP 1200	XLS/XLP 1400	XLS/XLP 1600	ESW 400	ESW 800	ESW 1200	ESW 1600

EXTERIOR CORNER WALL COVERS

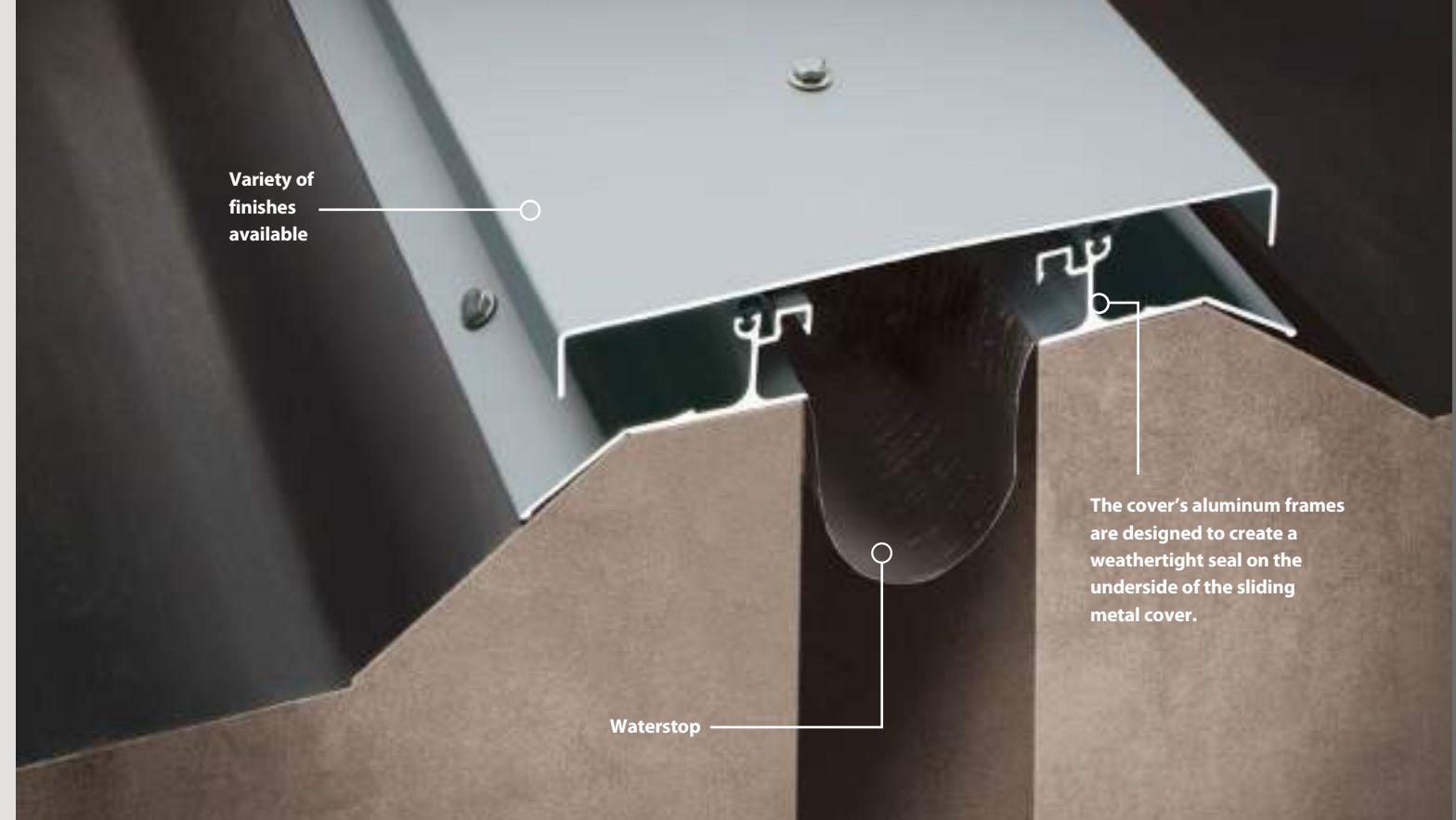
JOINT WIDTH	8"	10"	12"	14"	16"	4"	8"	12"	16"
MINIMUM OPENING	4.00"	4.00"	4.00"	4.00"	4.00"	3.25"	5.25"	7.25"	8.75"
MAXIMUM OPENING	16.00"	20.00"	24.00"	28.00"	32.00"	6.50"	10.50"	15.50"	20.50"
EXPOSED SURFACE	13.00"	15.00"	17.00"	19.00"	21.00"	8.00"	13.00"	18.00"	23.00"
SPECIFY MODEL	XLSC/XLPC 800	XLSC/XLPC 1000	XLSC/XLPC 1200	XLSC/XLPC 1400	XLSC/XLPC 1600	ESC 400	ESC 800	ESC 1200	ESC 1600

For odd and larger sized joints, call 800.233.8493 or visit www.c-sgroup.com/ejc.

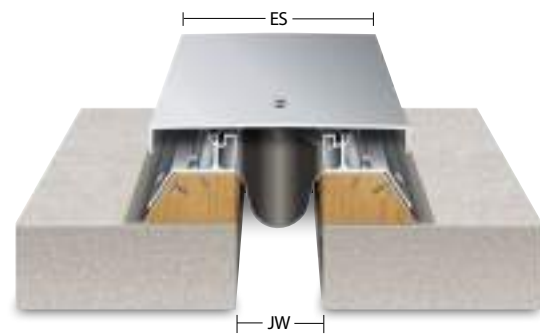
For comprehensive information on these products, visit www.c-sgroup.com/ejc.

Roof Covers 2" and Up

We offer multiple types of roof covers for flat and built-up roofs. Our metal and bellows roof covers expand and contract for multi-directional movement.



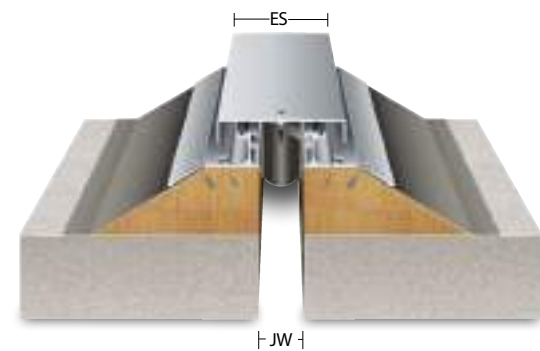
SRJ



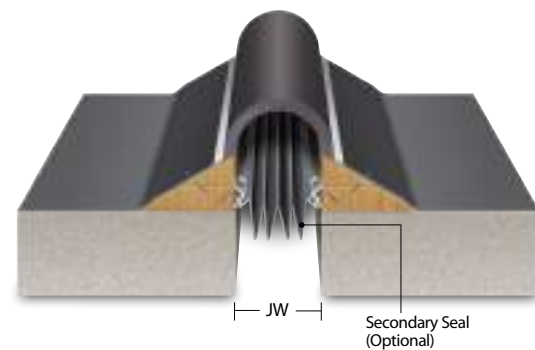
MARC



RJT



BRJ



MODEL DATA

ROOF TO ROOF COVERS

JOINT WIDTH	2"	4"	6"	8"	10"	12"	14"	16"	4"	6"	8"	10"	12"	14"	16"
MINIMUM OPENING	0.00"	0.00"	0.00"	0.00"	0.00"	0.00"	0.00"	0.00"	1.00"	1.00"	1.00"	1.00"	1.00"	1.00"	1.00"
MAXIMUM OPENING	3.00"	6.00"	9.00"	12.00"	15.00"	18.00"	21.00"	24.00"	7.50"	11.75"	12.50"	16.75"	20.75"	21.00"	24.25"
EXPOSED SURFACE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12.00"	15.00"	18.00"	21.00"	24.00"	27.00"	30.00"
SPECIFY MODEL	BRJ 200	BRJ 400	BRJ 600	BRJ 800	BRJ 1000	BRJ 1200	BRJ 1400	BRJ 1600	SRJ 400	SRJ 600	SRJ 800	SRJ 1000	SRJ 1200	SRJ 1400	SRJ 1600

ROOF TO WALL COVERS

JOINT WIDTH	2"	4"	6"	8"	10"	12"	14"	16"	4"	6"	8"	10"	12"	14"	16"
MINIMUM OPENING	0.00"	0.00"	0.00"	0.00"	0.00"	0.00"	0.00"	0.00"	0.00"	0.00"	4.50"	5.50"	6.50"	7.50"	8.50"
MAXIMUM OPENING	3.00"	6.00"	9.00"	12.00"	15.00"	18.00"	21.00"	24.00"	6.25"	8.75"	10.25"	13.25"	16.25"	17.50"	20.00"
EXPOSED SURFACE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.00"	10.50"	13.00"	15.50"	18.00"	20.50"	23.00"
SPECIFY MODEL	BRJW 200	BRJW 400	BRJW 600	BRJW 800	BRJW 1000	BRJW 1200	BRJW 1400	BRJW 1600	SRJW 400	SRJW 600	SRJW 800	SRJW 1000	SRJW 1200	SRJW 1400	SRJW 1600

For odd and larger sized joints, call 800.233.8493 or visit www.c-sgroup.com/ejc.

Note: RJT model data can be found at c-sgroup.com/ejc.

Note: MARC model data can be found at c-sgroup.com/ejc.

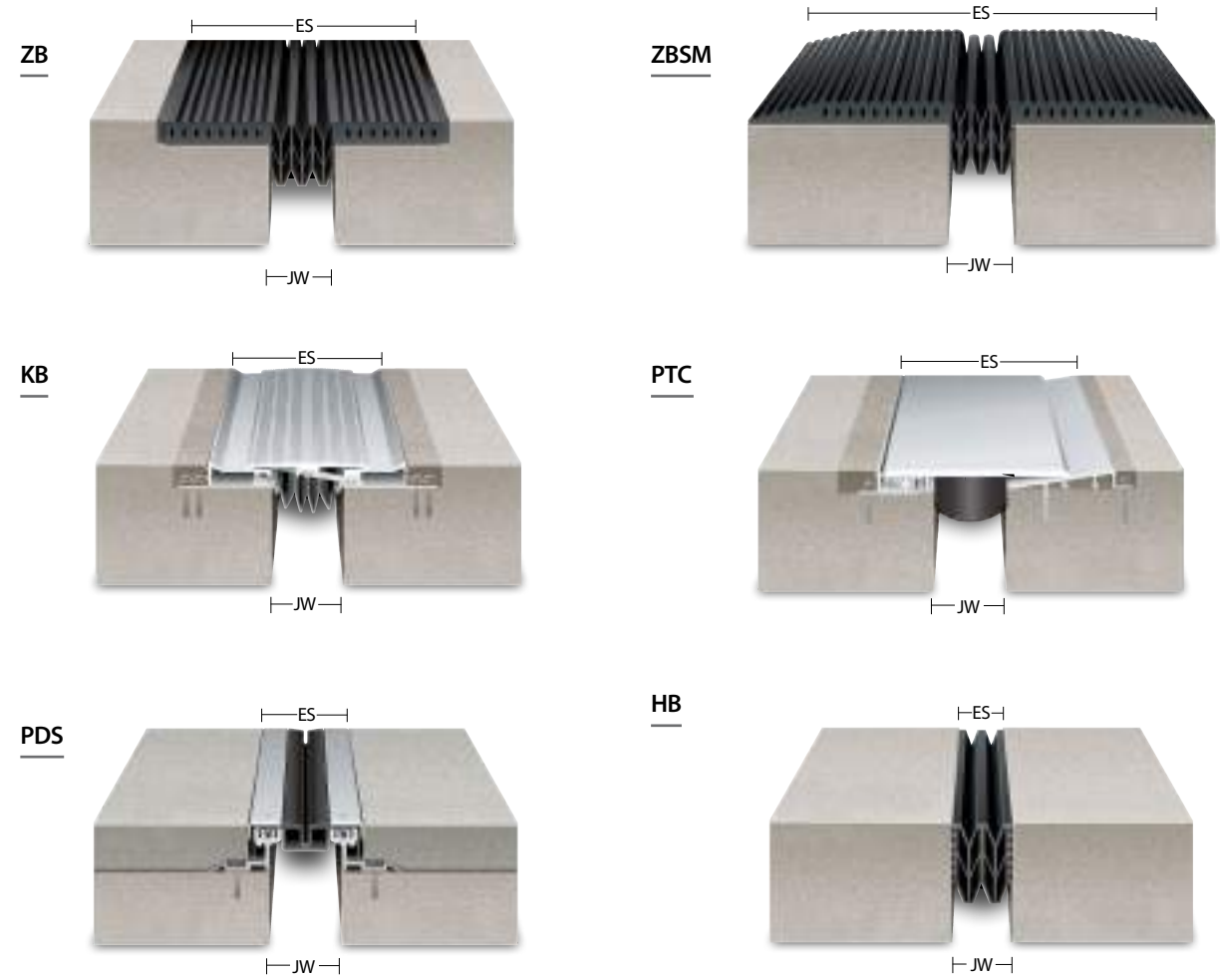
For comprehensive information on these products, visit www.c-sgroup.com/ejc.

Parking Covers and Seals 1"-16"

Our parking joint covers are designed to eliminate problems associated with standard parking joints.



PARKING COVERS



MODEL DATA

FLOOR TO FLOOR COVERS

JOINT WIDTH	4"	6"	8"	6"	8"	10"	12"	14"	16"	4"	6"	8"
MINIMUM OPENING	2.00"	2.00"	3.00"	0.00"	0.00"	0.00"	0.00"	0.00"	0.00"	3.00"	4.00"	5.50"
MAXIMUM OPENING	6.50"	9.50"	12.50"	11.00"	13.00"	16.00"	19.00"	22.00"	25.0"	5.25"	7.75"	10.25"
EXPOSED SURFACE	11.25"	16.25"	20.50"	19.63"	21.63"	24.63"	27.38"	30.38"	33.38"	7.63"	11.13"	14.13"
SPECIFY MODEL	KB 400	KB 600	KB 800	PTC 600	PTC 800	PTC 1000	PTC 1200	PTC 1400	PTC 1600	KBW 400	KBW 600	KBW 800

FLOOR TO FLOOR COVERS

JOINT WIDTH	1.0"	2.0"	3.0"	4.0"	1.0"	2.0"	3.0"	4.0"	1.0"	2.0"	3.0"	4.0"
MINIMUM OPENING	0.50"	1.00"	1.50"	2.00"	0.50"	1.00"	1.50"	2.00"	0.00"	0.75"	1.75"	1.50"
MAXIMUM OPENING	1.50"	3.00"	4.50"	6.00"	1.50"	3.00"	4.50"	6.00"	2.25"	3.25"	4.25"	6.50"
EXPOSED SURFACE	8.00"	9.00"	10.00"	11.00"	1.00"	2.00"	3.00"	4.00"	4.75"	4.75"	4.75"	6.75"
SPECIFY MODEL	ZB 100	ZB 200	ZB 300	ZB 400	HB 100	HB 200	HB 300	HB 400	PDA-100	PDA-200	PDA-300	PDA-400

ZBSM and ZB have the same model data. PDS and PDA have the same model data. For odd and larger sized joints, call 800.233.8493 or visit www.c-sgroup.com/ejc.

For comprehensive information on these products, visit www.c-sgroup.com/ejc.

No matter what joint cover you need, we've got the right fire barrier.

When an expansion or seismic joint passes through a fire-rated structure, it is necessary to maintain the fire integrity of that structure.

Maintaining the integrity of a two-inch wide joint is quite simple; however, a joint designed for seismic movement up to 24 inches becomes a more difficult proposition. **In general, the wider the joint, the more complex the fire barrier.** We have simplified our fire barrier for small joint sizes for easy installation and to maximize cost effectiveness. (See Reflex®.) It is critical to coordinate transitions between floor and wall fire barrier to properly rate the condition. Current building codes require fire barrier to limit the passing of heat and flame for two, three and sometimes four hours, as well as accommodate the dynamic movement for which the joint was designed. ASTM E 1966 and UL 2079 specify criteria for cycling a fire barrier 500 times prior to fire testing.



UL TESTING

We test all our fire barrier at Underwriters Laboratory (UL) because they represent the most stringent and universally accepted testing authority. UL 2079 cycling tests are included.

REFLEX® 1"-4"



Stainless steel foil drape with block insulation affords maximum economy in material and installation. Wall barriers require no stainless foil drape.

NOMINAL JOINT WIDTH	CS MODEL FLOORS	CS MODEL GYPSUM WALL	CS MODEL MASONRY WALL
1	RFX-1F	RFX-1W (GYP.)	RFX-1W (CONC)
	RFX-1F		RFX-1W (1 HR CONC)
2	RFX-2F	RFX-2W (GYP.)	RFX-2W (CONC)
	RFX-2F	RFX-2W (1 HR GYP.)	RFX-2W (1 HR CONC)
3	RFX-3F	RFX-3WC	RFX-3WC
4	RFX-4F	RFX-4WC	RFX-4WC

MONOFLEX (OFX) 3"-20" & MULTIFLEX® (MFX) 3"-12"



Sandwiched layers of stainless steel foil and insulation contained in a stainless steel mesh. Multiflex should be used where lateral shear is required in floor applications having a 3"-12" joint width.

NOMINAL JOINT WIDTH	CS MODEL FLOORS	CS MODEL GYPSUM WALL	CS MODEL MASONRY WALL
3-20	OFX-3F-20F	OFX-3W-20W (GYP)	OFX-3W-20W (CONC)
3-12	MFX-3F-12F	OFX-3W-12W (GYP)	OFX-3W-12W (CONC)

FB97 13" AND UP



Multiple drape configurations of stainless foil and insulation utilize air pockets for additional insulation performance. Sliding frame is available for 200% lateral shear applications in floors.

NOMINAL JOINT WIDTH	CS MODEL FLOORS	CS MODEL GYPSUM WALL	CS MODEL MASONRY WALL
13-24	FB97-13-24	FB97-13-24 (GYP)	FB97-13-24 (CONC)
25-36	FB97-25-36	NA	NA
13-24	FB97-13(LS)-24(LS)	NA	NA
25-36	FB97-25(LS)-36(LS)	NA	NA

LS designation indicates a special adaptation of the floor fire barrier to accommodate lateral shear movement. FB-97 wall fire barriers naturally provide lateral shear movement.

For comprehensive information on these products, visit www.c-sgroup.com/ejc.

Our pricing is all-inclusive.



ALL OF THE FOLLOWING ARE INCLUDED IN OUR PRICE:

Accurate quotes when you need them, how you need them

Complete shop drawings

A project manager to control the process from quote through installation

All code-compliant hardware required to mount covers properly to the building

Specialized equipment to help with installation

Staggered shipments to ensure materials arrive at the proper times

Remember to ask—**“What’s included?”**



Construction Specialties®

CS creates products that solve complex building challenges around the world:

Acrovyn by Design®

Acrovyn® Doors & Frames

Acrovyn® Wall Panels

Acrovyn® Wall Protection

Architectural Louvers

Cubicle Curtains & Track

Entrance Flooring

Expansion Joint Covers

Grilles & Vision Barriers

Specialty Venting

Sun Controls

6696 State Route 405
Muncy, Pennsylvania 17756 U.S.A.
800.233.8493

895 Lakefront Promenade
Mississauga, Ontario L5E 2C2 Canada
888.895.8955

www.c-sgroup.com

© Copyright 2016 Construction Specialties, Inc.

Construction Specialties, Inc. reserves the right to make design changes or to withdraw any design without notice.
Construction Specialties, Inc. holds a patent(s) on one or more of the products listed herein.

For detailed patent information, see www.c-sgroup.com/patents.

Printed in U.S.A. Series 17

