

STRONGWELL®

COMPOSOLITE®

FIBERGLASS BUILDING PANEL SYSTEM



COMPOSOLITE® Building Panel System



Odor control covers at the Trinity River Waste Water Treatment Plant in Dallas, Texas, utilize COMPOSOLITE® panels because of the product's extensive benefits. The panels provided strong, lightweight, corrosion resistant covers for the large wastewater treatment facility.



An all-composite bascule bridge in Bridgetown, Barbados, was built using Strongwell's COMPOSOLITE® building panel system, EXTREN® structural shapes and a custom heavy-duty building panel. The drawbridge is mainly used by pedestrians in this tourist destination, but it is also designed to support vehicular traffic.



The Lexington Waste Water Treatment Plant used COMPOSOLITE® panels to refurbish its above-ground trickling filters. COMPOSOLITE® was chosen because of its corrosion resistance, ease of installation and long-term reduced maintenance cost.

COMPOSOLITE® is a patented advanced composite building panel system suitable for major load bearing structural applications. The modular construction system consists of a small number of interlocking fiber reinforced polymer (FRP) structural components produced by the pultrusion process. The main building panel is 3" thick x 24" wide (80mm x 605mm) nominal size and features a cellular construction. Panels can be connected using the 3-way connectors, 45° connectors, toggles and/or hangers.

This uniquely designed system of interlocking components makes it possible to design fiberglass structures at significantly lower costs for a broad range of construction applications. COMPOSOLITE® structures can be designed in "kit form" and shipped flat to the job site.

Typical applications include:

- Buildings
- Bridge Decks
- Platforms & Walkways
- Secondary Containment
- Bridge Enclosure Systems
- Tank Covers
- Cellular Enclosures
- Baffles

System Design

COMPOSOLITE® is a system of five interlocking components manufactured of pultruded fiberglass reinforced polymer. The system combines manufacturing simplicity with an almost unlimited number of configurations.

The COMPOSOLITE® panel features integrally molded longitudinal grooves into which a connector or toggle is inserted during assembly. 3-way and 45° connectors allow the system components to turn corners and facilitate the joining of walls or sides. Toggles lock panels and connectors together securely. For added flexibility, the system also includes a hanger and an end cap.

For permanent structures, joints between panels and connectors are bonded during assembly. Adhesive is applied along the length of the panel and connector. The toggle, to which adhesive is not applied, is then inserted to mechanically secure the components and create even pressure along the length of the joint until the adhesive between the panel and connector cures.

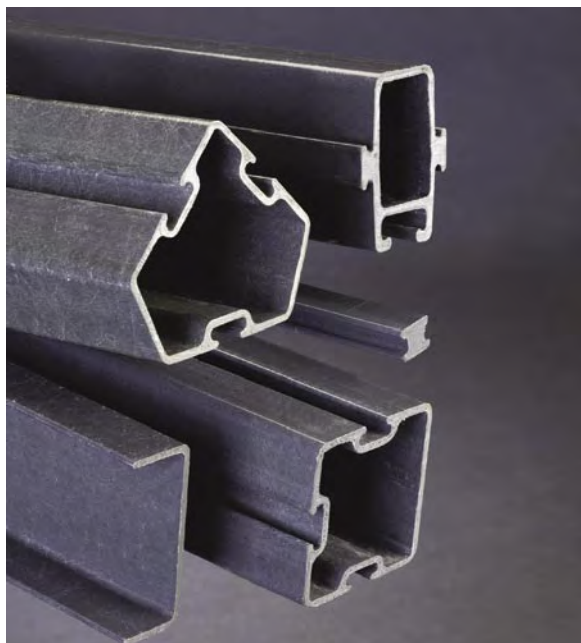
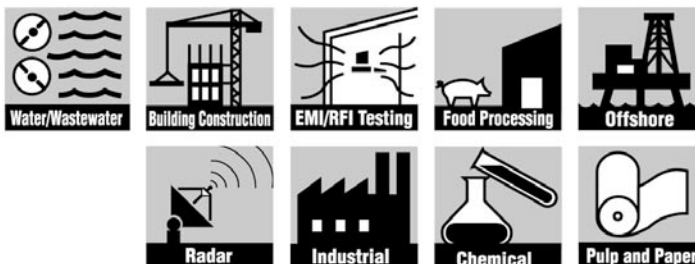
Materials of Construction

The FRP construction of COMPOSOLITE® makes the system particularly well-suited for outdoor use and/or corrosive environments.

Standard COMPOSOLITE® features a polyester fire retardant resin system in a slate gray color. The standard fire retardant resin meets the requirements of Class 1 rating of 25 or less per ASTM E-84 and the self-extinguishing requirements of ASTM D-635. The resin is UV inhibited and the composite includes a surface veil on all exposed surfaces for enhanced corrosion and UV protection.

Other colors and resins, including polyester, vinyl ester and NSF 61 certified resin systems, are available upon request.

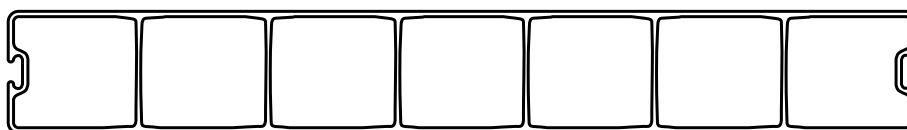
System Components



Mechanical Properties *(minimum)*

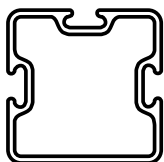
Properties	ASTM		
	Test Method	Value	(MPa)
Flexural Strength, LW	D790	24.5 ksi	(169)
Flexural Strength, CW	D790	8.2 ksi	(57)
Flexural Modulus , LW	D790	885 ksi	(6102)
Flexural Modulus, CW	D790	646 ksi	(4454)
Tensile Strength	D638	31.1 ksi	(214)
Tensile Modulus	D638	2,486 ksi	(17140)
Short Beam Shear	D2344	3.19 ksi	(22)

NOTE: All values are minimum ultimate properties from coupon tests.

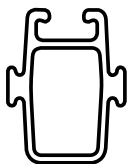


Panel

(3.16" x 23.80" nominal size — 80.26mm x 604.52mm actual) 7.48 lbs/ft (11.13 kg/m)



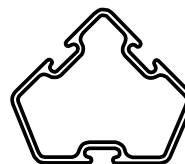
3-Way Connector
3" x 3" nominal size
(80mm x 80mm)
1.70 lbs/ft
(2.53 kg/m)



Hanger
1-1/2" x 3" nominal size
(80mm x 40mm)
1.59 lbs/ft
(2.37 kg/m)



Toggle
.33 lbs/ft
(0.49 kg/m)



45° Connector
1.75 lbs/ft
(2.61 kg/m)



End Cap
.60 lbs/ft
(0.89 kg/m)

Applications and Solutions



COMPOSOLITE® panels withstand the harsh environment of cooling towers with ease. The panel system not only provides excellent structural properties, but the rot and corrosion resistant panels will last for years to come.



COMPOSOLITE® panels and SAFRAIL™ handrail compose this walkway installed along a commuter rail track by the Maryland Transit Administration. The nonconductive and corrosion resistant FRP walkway provides a safe walking surface and has lower installation and maintenance costs than a steel walkway.



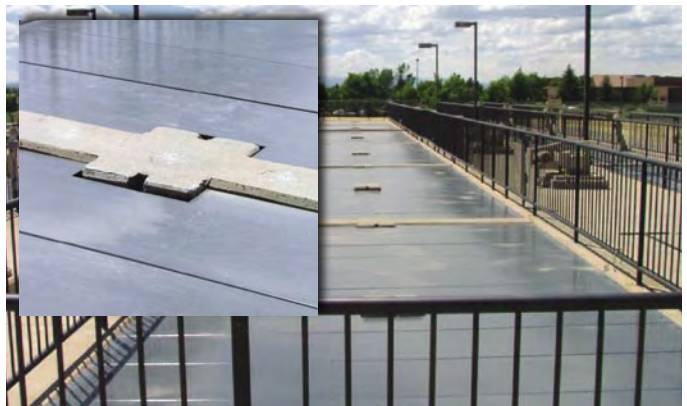
Versatile COMPOSOLITE® panels serve as a baffle system in this chlorine contact chamber.



COMPOSOLITE® panels are ideal for use as odor control covers. The strong yet lightweight covers are easy to handle and can withstand the harsh environment for years. The panels also require little to no maintenance.



COMPOSOLITE® building panels are incorporated into reusable scaffolding in this bridge reconstruction project. The panels were pultruded in a safety yellow color and served as working platforms when construction workers replaced the bridge's bearings. Upon completion, the panels can be stored for use on future projects.





An oil containment system using COMPOSOLITE® surrounds a transformer at this electric utility substation. Compared to concrete or earthen containment systems, the COMPOSOLITE® system saves time and money during installation.



A visitor center in Bristol, UK, is constructed of COMPOSOLITE® panels, 3-way connectors and toggles with no supporting frame. Cells of panels and 3-way connectors were filled with foam for thermal insulation.



COMPOSOLITE® panels are fabricated into attractive, strong, lightweight and rot resistant gates that provide access to trash storage bins. The aesthetically pleasing and low maintenance material is a better alternative to steel or wood gates.



A removable dock system featuring lightweight, corrosion resistant COMPOSOLITE® panels and EXTREN® structural shapes is located on the Baufort Sea. The sea freezes in winter, making easy removal of dock sections a necessity for the customer. Each section is 12' wide by 30' (3.66m x 9.14m) long.



A floating office in the San Francisco Bay was constructed using the COMPOSOLITE® building panel system. The fiberglass structure was designed using COMPOSOLITE® FRP panels because they are less expensive than steel or concrete and were also easy to assemble.



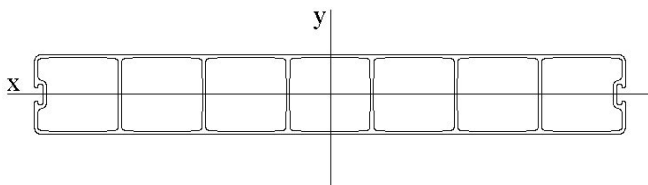
A wash housing is constructed using COMPOSOLITE® 3-way connectors, toggles and panels. No internal structure is required. Dimensions are 36' x 16' x 14'-3/4" (11m x 4.88m x 4.29m) high. Low maintenance, ease of construction and an attractive appearance greatly benefited the customer.

Allowable Uniform Load Table (psf) (kPa)

SPAN (ft.) (m)	@Δ=Span/60			@Δ=Span/120			@Δ=Span/180		
	Δ (IN.) (mm)	Siding	Roofing	Δ (IN.) (mm)	Siding	Roofing	Δ (IN.) (mm)	Siding	Roofing
4 (1.22)	.8 (20.3)	*778 (37.3)	*774 (37.1)	.4 (10.2)	*778 (37.3)	*774 (37.1)	.27 (6.9)	*778 (37.3)	*774 (37.1)
5 (1.52)	1.0 (25.4)	*624 (29.9)	*620 (29.7)	.5 (12.7)	*624 (29.9)	*620 (29.7)	.33 (8.4)	490 (23.5)	486 (23.3)
6 (1.83)	1.2 (30.5)	*520 (24.9)	*516 (24.7)	.6 (15.2)	449 (21.5)	445 (21.3)	.40 (10.2)	299 (14.3)	295 (14.1)
7 (2.13)	1.4 (35.6)	*466 (22.3)	*466 (22.3)	.7 (17.8)	303 (14.5)	299 (14.3)	.47 (11.9)	204 (9.8)	200 (9.6)
8 (2.44)	1.6 (40.6)	*390 (18.7)	*386 (18.5)	.8 (20.3)	214 (10.2)	210 (10.1)	.53 (13.5)	142 (6.8)	138 (6.6)
9 (2.74)	1.8 (45.7)	311 (14.9)	308 (14.7)	.9 (22.9)	156 (7.5)	152 (7.3)	.60 (15.2)	104 (5.0)	100 (4.7)
10 (3.05)	2.0 (50.8)	233 (11.1)	229 (11.0)	1.0 (25.4)	116 (5.5)	112 (5.4)	.67 (17.0)	78 (3.7)	74 (3.5)
11 (3.35)	2.2 (55.9)	176 (8.4)	172 (8.2)	1.1 (27.9)	88 (4.2)	84 (4.0)	.73 (18.5)	59 (2.8)	55 (2.6)
12 (3.66)	2.4 (61.0)	140 (6.7)	136 (6.5)	1.2 (30.5)	70 (3.4)	64 (3.1)	.80 (20.3)	47 (2.3)	43 (2.1)
13 (3.96)	2.6 (66.0)	110 (5.3)	106 (5.1)	1.3 (33.0)	56 (2.7)	52 (2.5)	.87 (22.1)	37 (1.8)	33 (1.6)
14 (4.27)	2.8 (71.1)	90 (4.3)	86 (4.1)	1.4 (35.6)	48 (2.3)	44 (2.1)	.93 (23.6)	30 (1.4)	26 (1.2)
15 (4.57)	3.0 (76.2)	74 (3.5)	70 (3.4)	1.5 (38.1)	37 (1.8)	33 (1.5)	1.00 (25.4)	25 (1.2)	21 (1.0)
16 (4.88)	3.2 (81.3)	61 (2.9)	57 (2.7)	1.6 (40.6)	30 (1.4)	26 (1.2)	1.09 (27.7)	21 (1.0)	17 (0.8)
17 (5.18)	3.4 (86.4)	51 (2.4)	47 (2.3)	1.7 (43.2)	25 (1.2)	21 (1.0)	1.13 (28.7)	17 (0.8)	13 (0.6)
18 (5.49)	3.6 (91.4)	43 (2.1)	39 (1.9)	1.8 (45.7)	22 (1.1)	18 (.86)	1.20 (30.5)	14 (0.7)	10 (0.5)
19 (5.79)	3.8 (95.5)	36 (1.7)	32 (1.5)	1.9 (48.3)	18 (.86)	14 (.67)	1.27 (32.3)	12 (0.6)	8 (0.4)
20 (6.10)	4.0 (101.6)	32 (1.5)	28 (1.3)	2.0 (50.8)	15 (.71)	11 (.52)	1.33 (33.8)	11 (0.5)	7 (0.3)

*Controlled by strength with a factor of safety of 2.50 for flexural and 3.0 for shear. Note: All values are typical.

Section Properties



$$I_x = 15.9 \text{ in.}^4 (6.62 \times 10^6 \text{ mm}^4)$$

$$S_x = 10.2 \text{ in.}^3 (0.167 \times 10^6 \text{ mm}^3)$$

$$r_x = 1.33 \text{ in.} (33.8 \text{ mm})$$

$$I_y = 422 \text{ in.}^4 (176 \times 10^6 \text{ mm}^4)$$

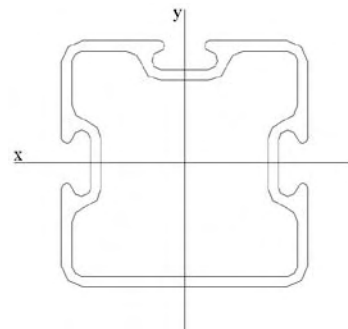
$$S_y = 39.9 \text{ in.}^3 (0.654 \times 10^6 \text{ mm}^3)$$

$$r_y = 6.88 \text{ in.} (176 \text{ mm})$$

$$A = 8.89 \text{ in.}^2 (5735 \text{ mm}^2)$$

$$Aw_x = 2.78 \text{ in.}^2 (1794 \text{ mm}^2)$$

$$Aw_y = 6.11 \text{ in.}^2 (3942 \text{ mm}^2)$$



$$I_{xx} = 2.73 \text{ in.}^4 (1.14 \times 10^6 \text{ mm}^4)$$

$$I_{yy} = 2.69 \text{ in.}^4 (1.11 \times 10^6 \text{ mm}^4)$$

$$S_{xx} = 1.80 \text{ in.}^3 (2.95 \times 10^4 \text{ mm}^3)$$

$$S_{yy} = 1.71 \text{ in.}^3 (2.80 \times 10^4 \text{ mm}^3)$$

$$A = 2.01 \text{ in.}^2 (1296 \text{ mm}^2)$$

$$r_x = 1.17 \text{ in.} (30 \text{ mm})$$

$$r_y = 1.17 \text{ in.} (29 \text{ mm})$$

Load Table (Metric)

Span (ft) (m)		E _a I (10 ⁶ lbf-in ²) (10 ⁹ N-cm ²)															
6 (1.83)	C	300 (1334)	600 (2667)	900 (4001)	1000 (4445)	1250 (5557)	1500 (6668)	1750 (7780)	2000 (8891)	2250 (10002)	2500 (11114)	2750 (12225)	3000 (13336)	--	--	--	--
	ΔC	.06" (1.53)	.11" (2.80)	.19" (4.82)	.19" (4.83)	.23" (5.85)	.28" (7.12)	.32" (8.13)	.39" (9.40)	.42" (10.68)	.46" (11.69)	.51" (12.96)	.55" (13.98)	42.7 (1.23)	--	--	--
	ΔU	.03" (0.76)	.07" (1.78)	.10" (2.54)	.11" (2.80)	.14" (3.56)	.17" (4.32)	.20" (5.08)	.23" (5.85)	.26" (6.61)	.28" (7.12)	.31" (7.88)	.34" (8.64)	42.7 (1.23)	--	--	--
7 (2.13)	C	300 (1334)	600 (2667)	900 (4001)	1000 (4445)	1250 (5557)	1500 (6668)	1750 (7780)	2000 (8891)	2250 (10002)	2500 (11114)	--	--	--	--	--	--
	ΔC	.08" (2.03)	.15" (3.81)	.23" (5.85)	.26" (6.61)	.32" (8.13)	.38" (9.66)	.45" (11.44)	.51" (12.96)	.58" (14.74)	.64" (16.27)	--	--	48.2 (1.38)	--	--	--
	ΔU	.05" (1.27)	.10" (2.54)	.14" (3.56)	.16" (4.07)	.20" (5.08)	.24" (6.10)	.28" (7.12)	.32" (8.13)	.36" (9.15)	.40" (10.17)	--	--	48.2 (1.38)	--	--	--
8 (2.44)	C	300 (1334)	600 (2667)	900 (4001)	1000 (4445)	1250 (5557)	1500 (6668)	1750 (7780)	2000 (8891)	2250 (10002)	--	--	--	--	--	--	--
	ΔC	.15" (3.81)	.23" (5.85)	.34" (8.64)	.38" (9.66)	.48" (12.20)	.58" (14.74)	.67" (17.03)	.77" (19.57)	.86" (21.86)	--	--	--	48.6 (1.39)	--	--	--
	ΔU	.07" (1.78)	.14" (3.56)	.21" (5.34)	.24" (6.10)	.30" (7.63)	.36" (9.15)	.41" (10.42)	.47" (11.95)	.53" (13.47)	--	--	--	48.6 (1.39)	--	--	--
9 (2.74)	C	300 (1334)	600 (2667)	900 (4001)	1000 (4445)	1250 (5557)	1500 (6668)	1750 (7780)	2000 (8891)	--	--	--	--	--	--	--	--
	ΔC	.16" (4.07)	.32" (8.13)	.47" (11.95)	.53" (13.47)	.66" (16.78)	.79" (20.08)	.92" (23.38)	1.05" (26.69)	--	--	--	--	50.2 (1.44)	--	--	--
	ΔU	.10" (2.54)	.20" (5.08)	.29" (7.37)	.33" (8.39)	.41" (10.42)	.49" (12.45)	.57" (14.49)	.65" (16.52)	--	--	--	--	50.2 (1.44)	--	--	--
10 (3.04)	C	300 (1334)	600 (2667)	900 (4001)	1000 (4445)	1250 (5557)	1500 (6668)	1750 (7780)	--	--	--	--	--	--	--	--	--
	ΔC	.21" (5.34)	.42" (10.68)	.63" (16.01)	.70" (17.79)	.87" (22.11)	1.05" (26.69)	1.22" (31.01)	--	--	--	--	--	51.8 (1.49)	--	--	--
	ΔU	.13" (3.30)	.26" (6.61)	.39" (9.91)	.44" (11.18)	.54" (13.73)	.65" (16.52)	.76" (19.32)	--	--	--	--	--	51.8 (1.49)	--	--	--
11 (3.35)	C	300 (1334)	600 (2667)	900 (4001)	1000 (4445)	1250 (5557)	1500 (6668)	1750 (7780)	--	--	--	--	--	--	--	--	--
	ΔC	.27" (6.86)	.55" (13.98)	.82" (20.84)	.92" (23.38)	1.14" (28.98)	1.4" (35.58)	1.6" (40.67)	--	--	--	--	--	52.4 (1.50)	--	--	--
	ΔU	.17" (4.32)	.35" (8.89)	.52" (13.21)	.57" (14.48)	.72" (18.29)	.85" (21.59)	1.00" (25.40)	--	--	--	--	--	52.4 (1.50)	--	--	--
12 (3.66)	C	300 (1334)	600 (2667)	900 (4001)	1000 (4445)	1250 (5557)	1500 (6668)	--	--	--	--	--	--	--	--	--	--
	ΔC	.35" (8.90)	.70" (17.79)	1.05" (26.69)	1.17" (29.74)	1.46" (37.11)	1.75" (44.48)	--	--	--	--	--	--	53.5 (1.54)	--	--	--
	ΔU	.22" (5.59)	.44" (11.18)	.65" (16.52)	.72" (18.30)	.91" (23.13)	1.09" (27.70)	--	--	--	--	--	--	53.5 (1.54)	--	--	--
13 (3.96)	C	300 (1334)	600 (2667)	900 (4001)	1000 (4445)	1250 (5559)	--	--	--	--	--	--	--	--	--	--	--
	ΔC	.44" (11.18)	.77" (22.37)	1.31" (33.30)	1.46" (37.11)	1.82" (46.26)	--	--	--	--	--	--	--	54.4 (1.56)	--	--	--
	ΔU	.28" (7.12)	.57" (14.49)	.85" (21.60)	.95" (24.15)	1.18" (29.99)	--	--	--	--	--	--	--	54.4 (1.56)	--	--	--
14 (4.27)	C	300 (1334)	600 (2667)	900 (4001)	1000 (4445)	1250 (5557)	--	--	--	--	--	--	--	--	--	--	--
	ΔC	.54" (13.73)	1.08" (27.45)	1.63" (41.43)	1.81" (46.00)	2.26" (57.44)	--	--	--	--	--	--	--	54.7 (1.57)	--	--	--
	ΔU	.34" (8.64)	.68" (17.28)	1.02" (25.93)	1.13" (28.72)	1.41" (35.84)	--	--	--	--	--	--	--	54.7 (1.57)	--	--	--
15 (4.57)	C	300 (1334)	600 (2667)	900 (4001)	1000 (4445)	--	--	--	--	--	--	--	--	--	--	--	--
	ΔC	.66" (16.78)	1.33" (33.80)	1.99" (50.58)	2.21" (56.17)	--	--	--	--	--	--	--	--	55.1 (1.58)	--	--	--
	ΔU	.41" (10.42)	.82" (20.84)	1.24" (31.52)	1.38" (35.08)	--	--	--	--	--	--	--	--	55.1 (1.58)	--	--	--
16 (4.87)	C	300 (1334)	600 (2667)	900 (4001)	1000 (4445)	--	--	--	--	--	--	--	--	--	--	--	--
	ΔC	.80" (20.33)	1.60" (40.67)	2.39" (60.75)	2.66" (67.61)	--	--	--	--	--	--	--	--	55.4 (1.59)	--	--	--
	ΔU	.51" (12.96)	1.0" (25.42)	1.50" (38.13)	1.66" (42.19)	--	--	--	--	--	--	--	--	55.4 (1.59)	--	--	--
17 (5.18)	C	300 (1334)	600 (2667)	900 (4001)	1000 (4445)	--	--	--	--	--	--	--	--	--	--	--	--
	ΔC	.96" (24.40)	1.91" (48.55)	2.87" (72.95)	3.19" (81.08)	--	--	--	--	--	--	--	--	55.5 (1.59)	--	--	--
	ΔU	.61" (15.50)	1.19" (30.25)	1.80" (45.75)	2.0" (50.83)	--	--	--	--	--	--	--	--	55.5 (1.59)	--	--	--
18 (5.49)	C	300 (1334)	600 (2667)	900 (4001)	1000 (445)	--	--	--	--	--	--	--	--	--	--	--	--
	ΔC	1.13" (28.72)	2.27" (57.70)	3.40" (86.42)	3.78" (96.08)	--	--	--	--	--	--	--	--	55.6 (1.60)	--	--	--
	ΔU	.70" (17.79)	1.41" (35.84)	2.11" (53.63)	2.36" (59.98)	--	--	--	--	--	--	--	--	55.6 (1.60)	--	--	--
19 (5.79)	C	300 (1334)	600 (2667)	900 (4001)	--	--	--	--	--	--	--	--	--	--	--	--	--
	ΔC	1.3" (33.03)	2.70" (68.63)	4.0" (101.67)	--	--	--	--	--	--	--	--	--	56.0 (1.61)	--	--	--
	ΔU	.84" (21.35)	1.69" (42.95)	2.48" (63.03)	--	--	--	--	--	--	--	--	--	56.0 (1.61)	--	--	--
20 (6.10)	C	300 (1334)	600 (2667)	900 (4001)	--	--	--	--	--	--	--	--	--	--	--	--	--
	ΔC	1.54" (39.13)	3.07" (78.03)	4.60" (116.92)	--	--	--	--	--	--	--	--	--	56.4 (1.62)	--	--	--
	ΔU	.96" (24.40)	1.91" (48.55)	2.87" (72.95)	--	--	--	--	--	--	--	--	--	56.4 (1.62)	--	--	--

E_a I = The typical apparent stiffness based on deflection testing; the load tables developed based on this stiffness are typical values

U = Uniform load (lbf/ft) (N/m)

C = Concentrated load (lbf) (N)

ΔC = Deflection inches (mm) under concentrated load

ΔU = Deflection inches (mm) under uniform load



STRONGWELL

ISO-9001:2000 Certified Manufacturing Plants

BRISTOL DIVISION

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