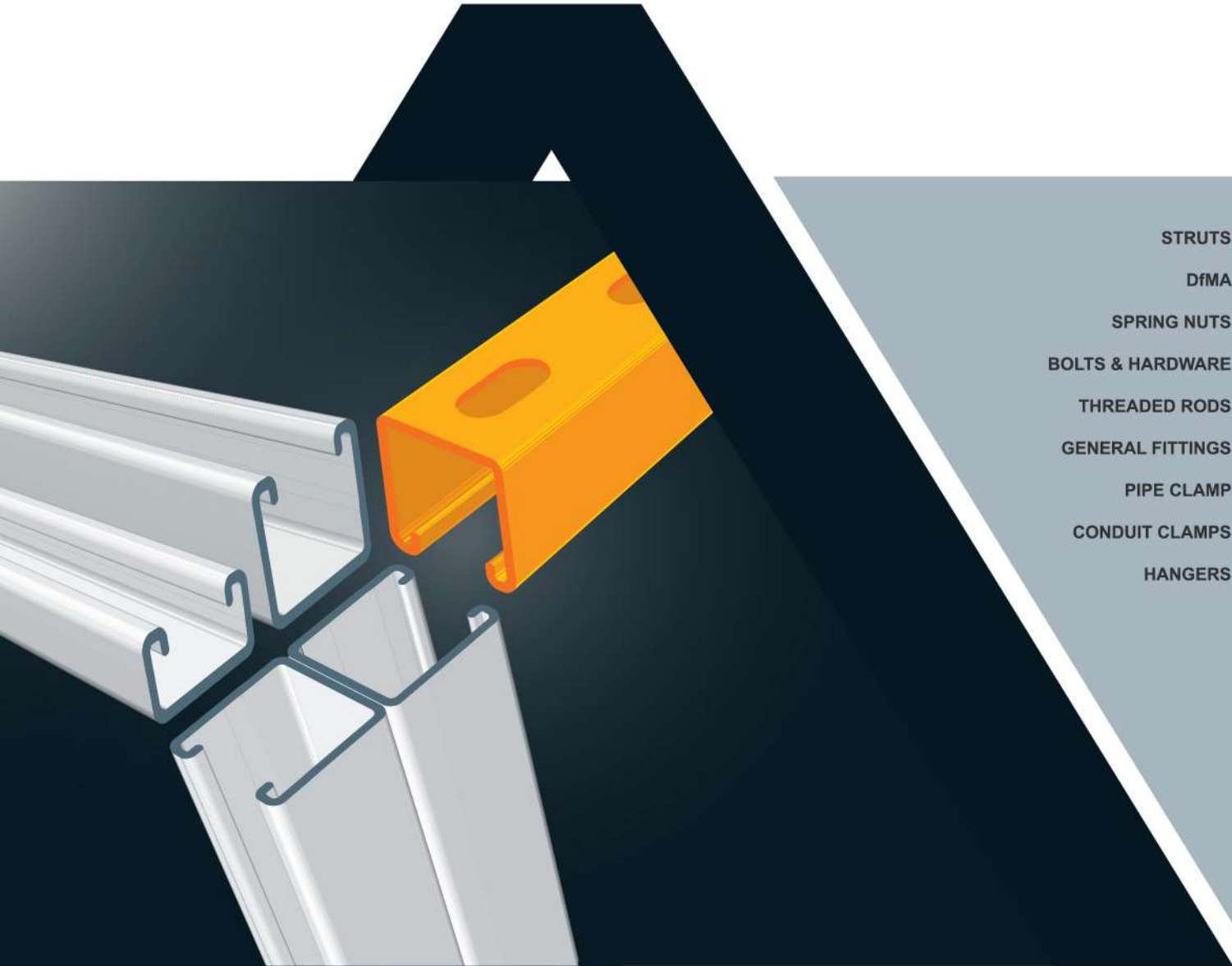


# METAL FRAMING

## CATALOGUE



STRUTS

DfMA

SPRING NUTS

BOLTS & HARDWARE

THREADED RODS

GENERAL FITTINGS

PIPE CLAMP

CONDUIT CLAMPS

HANGERS



Edition 2.0

# SMARTr<sup>®</sup>

Your Trusted Partner in  
Electrical & Mechanical Support

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# INTRODUCTION TO **SMARTr**<sup>®</sup>

Your Trusted  
Partner  
in Electrical &  
Mechanical Support



**SMARTr's** extensive product portfolio includes Metal Framing systems to meet and exceed industry standards for all light, medium and heavy-duty applications that are used in support of equipment for Electrical, DfMA (Design for Manufacture and Assembly), Mechanical, Plumbing, HVAC and Data Centres in new and retrofit Commercial and Industrial installations. Our comprehensive product range continues to grow through clients needs on unique applications that require specialised fittings for individual project needs.

## DfMA (Design for Manufacture & Assembly)

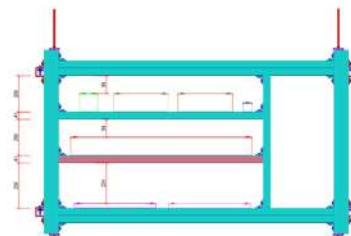
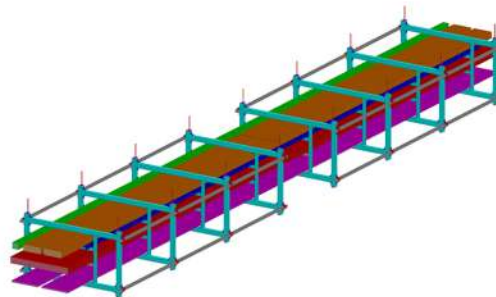
SMART's cut-to-length service maintains the integrity of the galvanised coating, reduces on site waste and provides substantial labour savings.

### Key benefits of DfMA include:

Shorter construction period – Most of the construction is done off-site, reducing the construction time and the amount of manpower required on-site

Improved workmanship – Due to stringent quality control in prefabrication factories

Reduction in dis-amenities – As lesser construction work is carried out on-site, it causes less disruption to the community

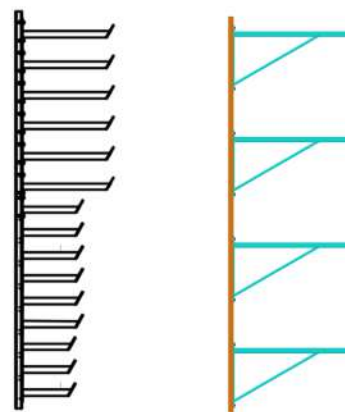


## Tunnel Strut Systems

Tunnel support calls for stringent standard and design requirements for safety and working in tight spaces.

SMART's design team is able to cater and design to specified tunnel project needs, based on highly detailed project requirements.

SMART has served various tunnel projects in many parts of the country, and continues to service ongoing projects.

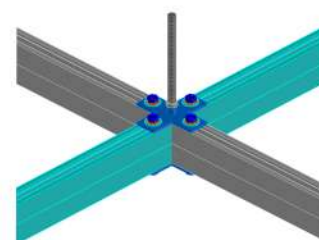
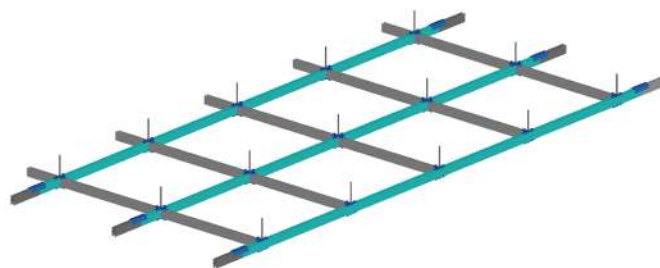


## High Ceiling Strut Systems

SMART's high ceiling strut systems is designed to deliver optimal operational flexibility and containment efficiency, and engineered to support other requirements, including cable management and fire suppression.

SMART high ceiling systems allow for extremely rapid installation times providing extensive cost benefits over the more traditional & cumbersome structural ceiling systems.

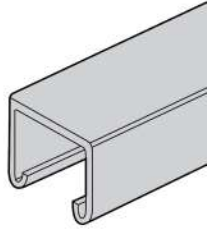
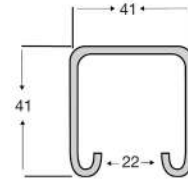
High ceiling strut systems are the optimal choice for applications where complex and concentrated overhead services are required including lighting, cable trays, fibre duct, fire protection, and power busways.



# SMART<sup>tr</sup> STRUT CHANNELS

## 41 x 41

ITEM CODE	: SS-4141-25 (For Hot-Dipped Galvanized)(For 2.5MM)
DIMENSION	: 41mm x 41mm
STD MATERIAL	: Hot-Roll Low-Carbon Steel
AVAIL THICKNESS	: 1.6~2.5MM
WEIGHT	: 2.78kg/M (For 2.5MM)
AVAILABLE LENGTH	: 3m / 5.8m / 6m as standard length
STD FINISH	: Hot-Dipped Galvanized
AVAILABLE FINISH	: Zinc Plated / Pre-Galvanized / Epoxy Powder Coated Stainless Steel 304 / 316 / 316L



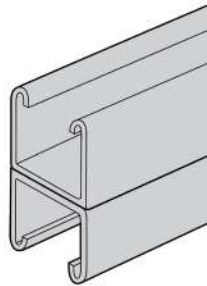
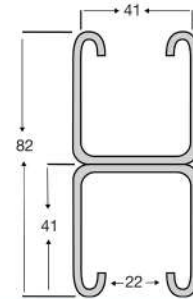
BEAM LOADING (METRIC) (FOR 2.5MM)					COLUMN LOADING (METRIC)	
Span or Column Effective Length (mm)	Max. Allowable Uniform Load (kg)	Max. Allowable Load Deflection (mm)	Uniform loading at Deflection		Max. Allowable Load At Slot Face (kg)	Max. Column Load Applied at C.G.K = 1.2 (kN)
			Span/240 (kg)	Span/360 (kg)		
500	927	1	927	927	2129	34.8
1000	463	4	460	336	1397	21.3
1500	309	9	224	153	1091	13.4
2000	231	15	122	82	887	9.6
2500	185	24	82	51	734	-
3000	154	34	51	40	-	-
3500	133	46	40	31	-	-
4000	122	62	31	20	-	-
4500	101	78	31	20	-	-
5000	91	97	20	NR	-	-
6000	81	136	NR	NR	-	-

Area of Section (cm <sup>2</sup> )	AXIS X - X			AXIS Y - Y		
	Moment of Inertia (cm <sup>4</sup> )	Section Modulus (cm <sup>3</sup> )	Radius of Gyration (cm)	Moment of Inertia (cm <sup>4</sup> )	Section Modulus (cm <sup>3</sup> )	Radius of Gyration (cm)
3.58	7.68	3.30	1.46	9.80	4.75	1.65

**Note:**  
I - Moment of Inertia  
Z - Section Modulus  
R - Radius of Gyration

## 41 X 41 2PC COMBINATION

ITEM CODE	: SS-4141-25BB (For Hot-Dipped Galvanized)(For 2.5MM)
DIMENSION	: 41mm x 82mm
STD MATERIAL	: Hot-Roll Low-Carbon Steel
AVAIL THICKNESS	: 1.6~2.5MM
WEIGHT	: 5.5kg/M (For 2.5MM)
AVAILABLE LENGTH	: 3m / 5.8m / 6m as standard length
STD FINISH	: Hot-Dipped Galvanized
AVAILABLE FINISH	: Zinc Plated / Pre-Galvanized / Epoxy Powder Coated Stainless Steel 304 / 316 / 316L



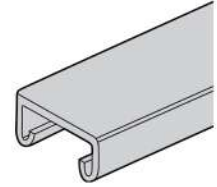
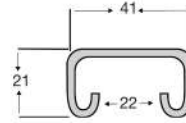
BEAM LOADING (METRIC)					COLUMN LOADING (METRIC)	
Span or Column Effective Length (mm)	Max. Allowable Uniform Load (kg)	Max. Allowable Load Deflection (mm)	Uniform loading at Deflection		Max. Allowable Load At Slot Face (kg)	Max. Column Load Applied at C.G.K = 1.2 (kN)
			Span/240 (kg)	Span/360 (kg)		
500	2688	1	2688	2688	2957	97.4
1000	1344	2	1325	1325	2886	83.9
1500	896	5	887	754	2733	56.4
2000	672	9	642	428	2437	33.3
2500	537	14	407	275	2080	21.3
3000	448	20	285	193	-	-
3500	377	26	203	142	-	-
4000	326	34	163	112	-	-
4500	295	44	122	81	-	-
5000	265	53	101	71	-	-
6000	224	78	71	40	-	-

Area of Section (cm <sup>2</sup> )	AXIS X - X			AXIS Y - Y		
	Moment of Inertia (cm <sup>4</sup> )	Section Modulus (cm <sup>3</sup> )	Radius of Gyration (cm)	Moment of Inertia (cm <sup>4</sup> )	Section Modulus (cm <sup>3</sup> )	Radius of Gyration (cm)
7.16	38.62	9.36	2.32	19.50	9.50	1.65

**Note:**  
I - Moment of Inertia  
Z - Section Modulus  
R - Radius of Gyration

## 41 x 21

ITEM CODE	: SS-4121-25 (For Hot-Dipped Galvanized) (For 2.5MM)
DIMENSION	: 41mm x 21mm
STD MATERIAL	: Hot-Roll Low-Carbon Steel
STD THICKNESS	: 1.6~2.5MM
WEIGHT	: 1.45kg/M (For 2.5MM)
AVAILABLE LENGTH	: 3m / 5.8m / 6m as standard length
STD FINISH	: Hot-Dipped Galvanized
AVAILABLE FINISH	: Zinc Plated / Pre-Galvanized / Epoxy Powder Coated Stainless Steel 304 / 316 / 316L



BEAM LOADING (METRIC)					COLUMN LOADING (METRIC)	
Span or Column Effective Length (mm)	Max. Allowable Uniform Load (kg)	Max. Allowable Load Deflection (mm)	Uniform loading at Deflection		Max. Allowable Load At Slot Face (kg)	Max. Column Load Applied at C.G.K = 1.2 (kN)
			Span/240 (kg)	Span/360 (kg)		
500	302	1.9	270	194	1050	24.4
1000	151	7.0	101	71	924	10.5
1500	100	15.0	41	31	640	-
1750	91	21.0	31	20	520	-
2000	75	26.8	31	20	-	-
2500	60	43.0	20	10	-	-
3000	50	60.0	10	10	-	-

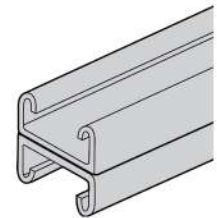
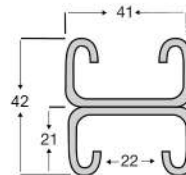
Area of Section (cm <sup>2</sup> )	AXIS X - X			AXIS Y - Y		
	Moment of Inertia (cm <sup>4</sup> )	Section Modulus (cm <sup>3</sup> )	Radius of Gyration (cm)	Moment of Inertia (cm <sup>4</sup> )	Section Modulus (cm <sup>3</sup> )	Radius of Gyration (cm)
2.55	1.54	1.18	0.78	5.94	2.88	1.53

**Note:**

I - Moment of Inertia  
Z - Section Modulus  
R - Radius of Gyration

## 41 X 21 2PC COMBINATION

ITEM CODE	: SS-4121-25BB (For Hot-Dipped Galvanized) (For 2.5MM)
DIMENSION	: 41mm x 42mm
STD MATERIAL	: Hot-Roll Low-Carbon Steel
STD THICKNESS	: 1.6~2.5MM
WEIGHT	: 2.9kg/M (For 2.5MM)
AVAILABLE LENGTH	: 3m / 5.8m / 6m as standard length
STD FINISH	: Hot-Dipped Galvanized
AVAILABLE FINISH	: Zinc Plated / Pre-Galvanized / Epoxy Powder Coated Stainless Steel 304 / 316 / 316L



BEAM LOADING (METRIC)					COLUMN LOADING (METRIC)	
Span or Column Effective Length (mm)	Max. Allowable Uniform Load (kg)	Max. Allowable Load Deflection (mm)	Uniform loading at Deflection		Max. Allowable Load At Slot Face (kg)	Max. Column Load Applied at C.G.K = 1.2 (kN)
			Span/240 (kg)	Span/360 (kg)		
500	893	1.4	795.0	795.0	1917	66.0
1000	446	4.3	467.0	326.1	1855	44.8
1500	297	9.6	214.0	142.7	1672	21
1750	245	11.7	163.1	101.0	1529	16
2000	223	16.0	122.2	81.3	1356	-
2500	178	24.0	81.3	50.1	1060	-
3000	148	36.0	50.0	40.2	-	-

Area of Section (cm <sup>2</sup> )	AXIS X - X			AXIS Y - Y		
	Moment of Inertia (cm <sup>4</sup> )	Section Modulus (cm <sup>3</sup> )	Radius of Gyration (cm)	Moment of Inertia (cm <sup>4</sup> )	Section Modulus (cm <sup>3</sup> )	Radius of Gyration (cm)
5.10	7.33	3.30	1.20	11.87	5.75	1.53

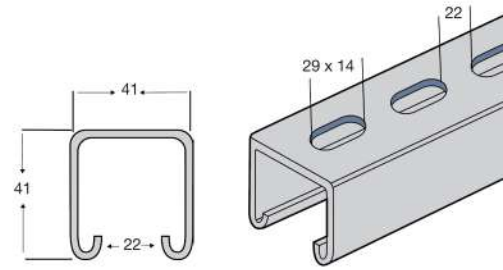
**Note:**

I - Moment of Inertia  
Z - Section Modulus  
R - Radius of Gyration

# SMART<sup>tr</sup> STRUT CHANNELS

## 41 X 41 SLOTTED

ITEM CODE	: SS-4141-25SL (For Hot-Dipped Galvanized) (For 2.5MM)
DIMENSION	: 41mm x 41mm
STD MATERIAL	: Hot-Roll Low-Carbon Steel
STD THICKNESS	: 1.6-2.5MM
WEIGHT	: 2.75kg/M (For 2.5MM)
AVAILABLE LENGTH	: 3m / 5.8m / 6m as standard length
STD FINISH	: Hot-Dipped Galvanized
AVAILABLE FINISH	: Zinc Plated / Pre-Galvanized / Epoxy Powder Coated Stainless Steel 304 / 316 / 316L



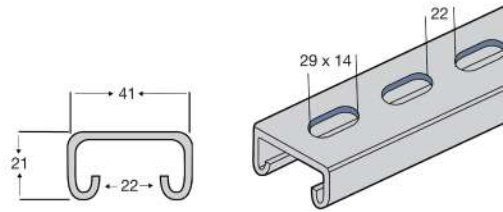
BEAM LOADING (METRIC)					COLUMN LOADING (METRIC)	
Span or Column Effective Length (mm)	Max. Allowable Uniform Load (kg)	Max. Allowable Load Deflection (mm)	Uniform loading at Deflection		Max. Allowable Load At Slot Face (kg)	Max. Column Load Applied at C.G.K = 1.2 (kN)
			Span/240 (kg)	Span/360 (kg)		
500	861	1.24	861	861	861	16.0
1000	430	4.37	430	272	272	13.6
1500	287	9.85	218	121	121	10.4
2000	215	17.48	122	67	67	8.8
2500	172	27.32	78	43	43	7.3
3000	143	39.25	54	30	30	-
3500	127	51.1	36	27	27	-
4000	113	69.5	27	18	18	-
4500	99	90.6	23	NR	NR	-
5000	87	114.8	18	NR	NR	-
6000	77	141.7	NR	NR	NR	-

Area of Section (cm <sup>2</sup> )	AXIS X - X			AXIS Y - Y		
	Moment of Inertia (cm <sup>4</sup> )	Section Modulus (cm <sup>3</sup> )	Radius of Gyration (cm)	Moment of Inertia (cm <sup>4</sup> )	Section Modulus (cm <sup>3</sup> )	Radius of Gyration (cm)
2.90	6.13	3.02	1.46	9.19	4.45	1.78

**Note:**  
I - Moment of Inertia  
Z - Section Modulus  
R - Radius of Gyration

## 41 X 21 SLOTTED

ITEM CODE	: SS-4121-25SL (For Hot-Dipped Galvanized) (For 2.5MM)
DIMENSION	: 41mm x 21mm
STD MATERIAL	: Hot-Roll Low-Carbon Steel
STD THICKNESS	: 1.6-2.5MM
WEIGHT	: 1.39kg/M (For 2.5MM)
AVAILABLE LENGTH	: 3m / 5.8m / 6m as standard length
STD FINISH	: Hot-Dipped Galvanized
AVAILABLE FINISH	: Zinc Plated / Pre-Galvanized / Epoxy Powder Coated Stainless Steel 304 / 316 / 316L



BEAM LOADING (METRIC)					COLUMN LOADING (METRIC)	
Span or Column Effective Length (mm)	Max. Allowable Uniform Load (kg)	Max. Allowable Load Deflection (mm)	Uniform loading at Deflection		Max. Allowable Load At Slot Face (kg)	Max. Column Load Applied at C.G.K = 1.2 (kN)
			Span/240 (kg)	Span/360 (kg)		
500	282	2.22	308.0	177.0	1298	-
1000	141	6.07	79.0	44.0	861	-
1500	94	13.64	35.0	20.0	-	-
1750	75	18.6	27.0	16.3	-	-
2000	64	24.26	20.0	11.0	-	-
2500	56	37.90	13.0	7.0	-	-
3000	47	54.57	9.0	5.0	-	-

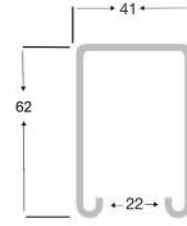
Area of Section (cm <sup>2</sup> )	AXIS X - X			AXIS Y - Y		
	Moment of Inertia (cm <sup>4</sup> )	Section Modulus (cm <sup>3</sup> )	Radius of Gyration (cm)	Moment of Inertia (cm <sup>4</sup> )	Section Modulus (cm <sup>3</sup> )	Radius of Gyration (cm)
1.97	0.99	0.92	0.71	5.31	2.57	1.65

**Note:**  
I - Moment of Inertia  
Z - Section Modulus  
R - Radius of Gyration

# SMART<sup>tr</sup> STRUT CHANNELS

## 41 x 62

**ITEM CODE** : SS-4162-25 (For Hot-Dipped Galvanized) (For 2.5MM)  
**DIMENSION** : 41mm x 62mm  
**STD MATERIAL** : Hot-Roll Low-Carbon Steel  
**AVAIL THICKNESS** : 1.6~2.5MM  
**WEIGHT** : 3.42kg/M (For 2.5MM)  
**AVAILABLE LENGTH** : 3m / 5.8m / 6m as standard length  
**STD FINISH** : Hot-Dipped Galvanized  
**AVAILABLE FINISH** : Zinc Plated / Pre-Galvanized / Epoxy Powder Coated  
 Stainless Steel 304 / 316 / 316L



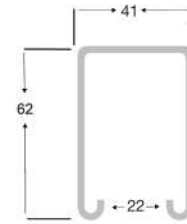
BEAM LOADING (METRIC) (FOR 2.5MM)					COLUMN LOADING (METRIC)	
Span or Column Effective Length (mm)	Max. Allowable Uniform Load (kg)	Max. Allowable Load Deflection (mm)	Uniform loading at Deflection		Max. Allowable Load At Slot Face (kg)	Max. Column Load Applied at C.G.K = 1.2 (kN)
			Span/240 (kg)	Span/360 (kg)		
610	1487	1	1487	1487	2036	50.8
914	993	2	993	993	1728	32.0
1219	743	4	743	648	1397	20.9
1524	594	6	594	412	1183	15.5
1829	494	9	430	285	1038	12.3
2134	426	12	317	213	929	10.2

Area of Section (cm <sup>2</sup> )	AXIS X - X			AXIS Y - Y		
	Moment of Inertia (cm <sup>4</sup> )	Section Modulus (cm <sup>3</sup> )	Radius of Gyration (cm)	Moment of Inertia (cm <sup>4</sup> )	Section Modulus (cm <sup>3</sup> )	Radius of Gyration (cm)
9.4	21.8	6.4	2.2	13.9	6.8	1.7

**Note:**  
 I - Moment of Inertia  
 Z - Section Modulus  
 R - Radius of Gyration

## 41 x 62 SLOTTED

**ITEM CODE** : SS-4162-25-SL (For Hot-Dipped Galvanized) (For 2.5MM)  
**DIMENSION** : 41mm x 62mm  
**STD MATERIAL** : Hot-Roll Low-Carbon Steel  
**AVAIL THICKNESS** : 1.6~2.5MM  
**WEIGHT** : 3.32kg/M (For 2.5MM)  
**AVAILABLE LENGTH** : 3m / 5.8m / 6m as standard length  
**STD FINISH** : Hot-Dipped Galvanized  
**AVAILABLE FINISH** : Zinc Plated / Pre-Galvanized / Epoxy Powder Coated  
 Stainless Steel 304 / 316 / 316L



BEAM LOADING (METRIC)					COLUMN LOADING (METRIC)	
Span or Column Effective Length (mm)	Max. Allowable Uniform Load (kg)	Max. Allowable Load Deflection (mm)	Uniform loading at Deflection		Max. Allowable Load At Slot Face (kg)	Max. Column Load Applied at C.G.K = 1.2 (kN)
			Span/240 (kg)	Span/360 (kg)		
610	1256	0.85	2284	2284	2513	82.7
914	1142	1.7	1126	1126	2453	71.3
1219	761	4.25	753	640	2323	47.9
1524	571	7.65	545	363	2071	28.3
1829	456	11.9	345	233	1768	18.1
2134	380	17	242	164	-	-

Area of Section (cm <sup>2</sup> )	AXIS X - X			AXIS Y - Y		
	Moment of Inertia (cm <sup>4</sup> )	Section Modulus (cm <sup>3</sup> )	Radius of Gyration (cm)	Moment of Inertia (cm <sup>4</sup> )	Section Modulus (cm <sup>3</sup> )	Radius of Gyration (cm)
7.99	32.82	7.95	1.97	16.57	8.07	1.40

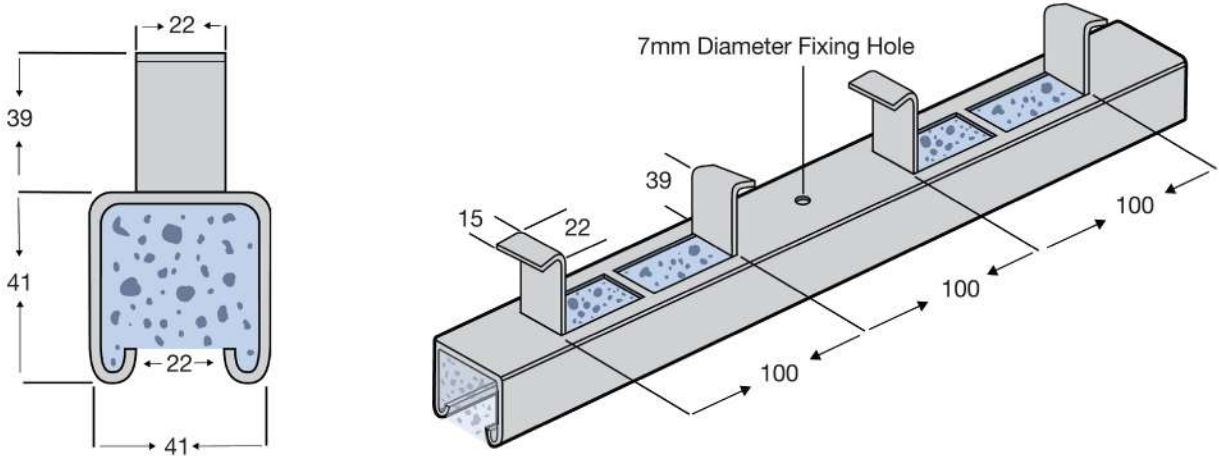
**Note:**  
 I - Moment of Inertia  
 Z - Section Modulus  
 R - Radius of Gyration



# PIPE CLAMPS AND BEAM CLAMPS

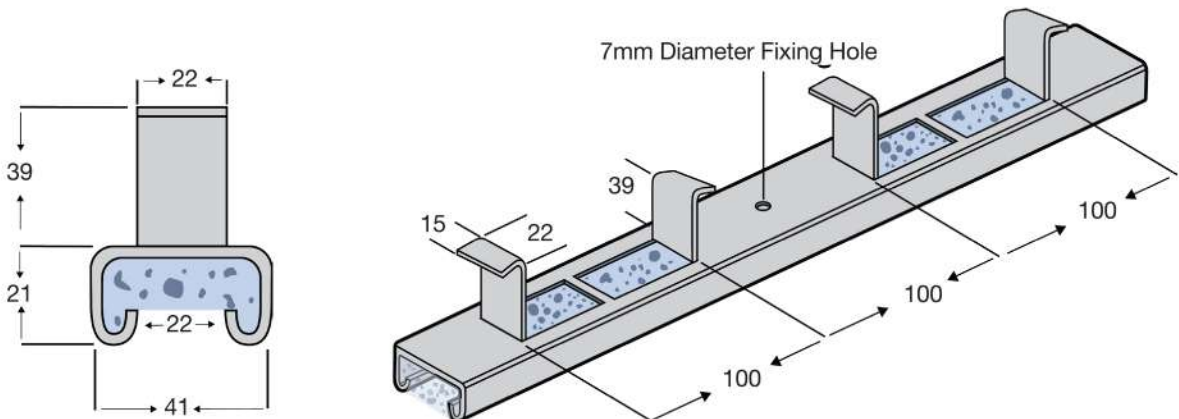
## 41 x 41 CI

- ITEM CODE** : SS-4141-25CI (For Hot-Dipped Galvanized) (For 2.5MM)
- DIMENSION** : 41mm x 41mm
- STD MATERIAL** : Hot-Roll Low-Carbon Steel
- AVAIL THICKNESS** : 1.6~2.5MM
- WEIGHT** : 2.80kg/M (For 2.5MM)
- AVAILABLE LENGTH** : As Ordered
- STD FINISH** : Hot-Dipped Galvanized
- AVAILABLE FINISH** : Zinc Plated / Pre-Galvanized / Epoxy Powder Coated / Stainless Steel 304 / 316 / 316L
- LOADING DATA** : The support capacity of any Concrete Insert depends largely on the strength of the concrete used.  
- We cannot guarantee any particular load.
- RECOMMENDED PULLOUT LOADING** : Inserts 300mm and over 8.43kN per 300mm
- NOTE** : Exercise care during installation, do not bend lugs.



## 41 x 21 CI

- ITEM CODE** : SS-4121-25CI (For Hot-Dipped Galvanized) (For 2.5MM)
- DIMENSION** : 41mm x 21mm
- STD MATERIAL** : Hot-Roll Low-Carbon Steel
- AVAIL THICKNESS** : 1.6~2.5MM
- WEIGHT** : 1.90kg/M (For 2.5MM)
- AVAILABLE LENGTH** : As Ordered
- STD FINISH** : Hot-Dipped Galvanized
- AVAILABLE FINISH** : Zinc Plated / Pre-Galvanized / Epoxy Powder Coated / Stainless Steel 304 / 316 / 316L
- LOADING DATA** : The support capacity of any Concrete Insert depends largely on the strength of the concrete used.  
- We cannot guarantee any particular load.
- RECOMMENDED PULLOUT LOADING** : Inserts 300mm and over 667kgf per 300mm
- NOTE** : Exercise care during installation, do not bend lugs.

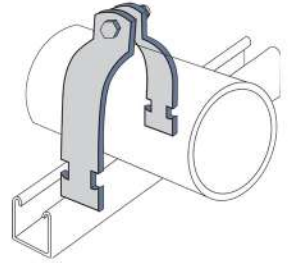


# SMART<sup>tr</sup> PIPE CLAMPS AND BEAM CLAMPS

## 2 PC CONDUIT PIPE CLAMP

**STD MATERIAL** : Steel  
**STD FINISH** : Pre-Galvanized  
**AVAILABLE FINISH** : HDG and other finishes available on request.  
**SIZE RANGE** : Larger size Conduit Pipe Clamp also available on request.

Code No.	Nominal Pipe Size (mm)	O.D Size (mm)	Thickness (mm)	Design Load (kg)
SSA-CONDCLAMP-20	20	26.7	2	272.26
SSA-CONDCLAMP-25	25	33.4	2	272.26
SSA-CONDCLAMP-32	32	42.2	2	272.26
SSA-CONDCLAMP-38	38	48.3	2.5	363.02
SSA-CONDCLAMP-50	50	60.3	2.5	363.02



## PIPE HANGER

**STD MATERIAL** : Steel  
**STD FINISH** : Pre-Galvanized  
**AVAILABLE FINISH** : HDG and other finishes available on request.  
**NOTE** : Pipe Hanger for Rigid Steel Conduit.

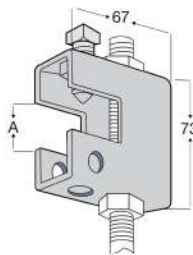
Code No.	Nominal Pipe Size (mm)	A Diameter (mm)	Weight/C (kg)
SSA-PH-20	20	8	8
SSA-PH-25	25	8	9
SSA-PH-32	32	8	11
SSA-PH-38	38	8	19
SSA-PH-50	50	8	27



## BEAM HANGER

**SSA-BC**  
**STD MATERIAL** : Steel  
**STD FINISH** : Pre-Galvanized  
**AVAILABLE FINISH** : HDG available on request.

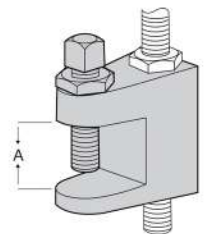
Max. Flange Thickness (mm)
16
22



## WEDGE C-CLAMP

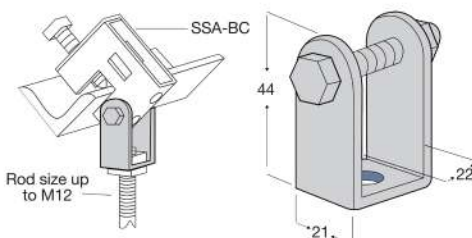
**SSA-BC-WCC**  
**STD MATERIAL** : Malleable Iron  
**STD FINISH** : Pre-Galvanized  
**AVAILABLE FINISH** : HDG available on request.

Max. Flange Thickness (mm)
25
35
45



## BEAM HANGER C/W SWIVEL BRACKET

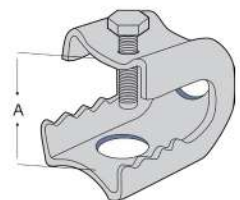
**SSA-BC-SW**  
**STD MATERIAL** : Steel  
**STD FINISH** : Pre-Galvanized  
**AVAILABLE FINISH** : HDG available on request.



## TIGER TOOTH CLAMP

**SSA-BC-TTC**  
**STD MATERIAL** : Steel  
**STD FINISH** : Pre-Galvanized  
**AVAILABLE FINISH** : HDG available on request.

Max. Flange Thickness (mm)
17
36



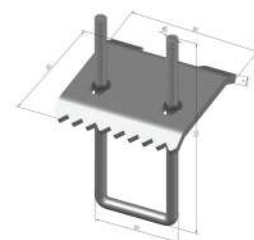
## 'U' BOLT 'I' BEAM CLAMP 86MM

**SSA-UBC-86** (Use with 41X41 Strut)  
**STD MATERIAL** : Steel  
**STD FINISH** : Pre-Galvanized  
**AVAILABLE FINISH** : HDG available on request



## 'U' BOLT 'I' BEAM CLAMP 127MM

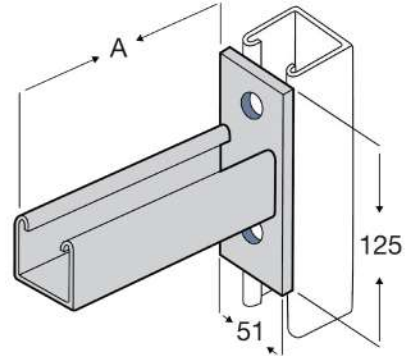
**SSA-UBC-127** (Use with 41X41 2 PC Combination)  
**STD MATERIAL** : Steel  
**STD FINISH** : Pre-Galvanized  
**AVAILABLE FINISH** : HDG available on request



## SINGLE CHANNEL BRACKET

**SSA-SCA**  
**STD MATERIAL** : Hot-Roll Low-Carbon Steel  
**STD FINISH** : Hot-Dipped Galvanized  
**AVAILABLE FINISH** : Zinc Plated / Pre-Galvanized / Epoxy Powder Coated / Stainless Steel 304 / 316 / 316L

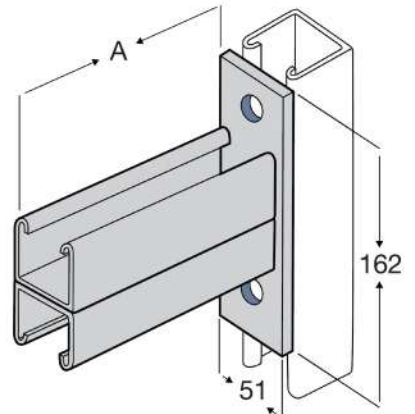
Code No.	A (mm)	Uniform Load Vertical Channel (kgf)
SSA-SCA-150	150	526
SSA-SCA-300	300	262
SSA-SCA-450	450	175
SSA-SCA-600	600	131
SSA-SCA-750	750	105
SSA-SCA-900	900	88



## DOUBLE CHANNEL BRACKET

**SSA-DCA**  
**STD MATERIAL** : Hot-Roll Low-Carbon Steel  
**STD FINISH** : Hot-Dipped Galvanized  
**AVAILABLE FINISH** : Zinc Plated / Pre-Galvanized / Epoxy Powder Coated / Stainless Steel 304 / 316 / 316L

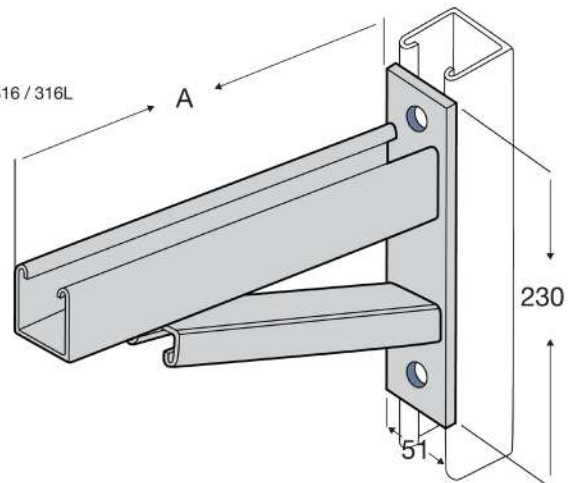
Code No.	A (mm)	Uniform Load Vertical Channel (kgf)
SSA-DCA-300	300	770
SSA-DCA-450	450	527
SSA-DCA-600	600	400
SSA-DCA-750	750	330
SSA-DCA-900	900	275



## BRACED CHANNEL BRACKET

**SSA-BCA**  
**STD MATERIAL** : Hot-Roll Low-Carbon Steel  
**STD FINISH** : Hot-Dipped Galvanized  
**AVAILABLE FINISH** : Zinc Plated / Pre-Galvanized / Epoxy Powder Coated / Stainless Steel 304 / 316 / 316L

Code No.	A (mm)	Uniform Load Vertical Channel (kgf)
SSA-BCA-300	300	1000
SSA-BCA-450	450	350
SSA-BCA-600	600	345
SSA-BCA-750	750	294
SSA-BCA-900	900	150



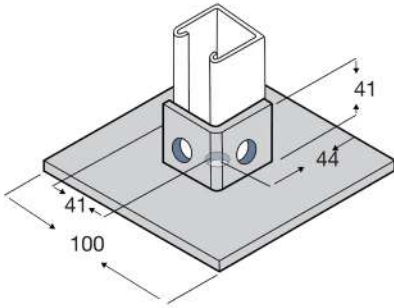
**Note** : Non-standard dimensions are available on request.

# SMART<sup>tr</sup> FLOOR BRACKET/POST BASE

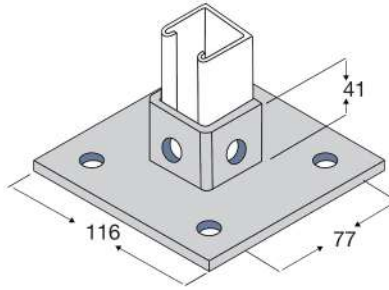
## Floor Bracket / Post Base

**STD DIMENSIONS** : For 41.3mm width series channel fittings.  
**STD HOLE DIA** : 12.5mm  
**STD MATERIAL** : Hot-Roll Low-Carbon Steel  
**STD FINISH** : Hot-Dipped Galvanized  
**AVAILABLE FINISH** : Zinc Plated / Pre-Galvanized / Epoxy Powder Coated / Stainless Steel 304 / 316 / 316L

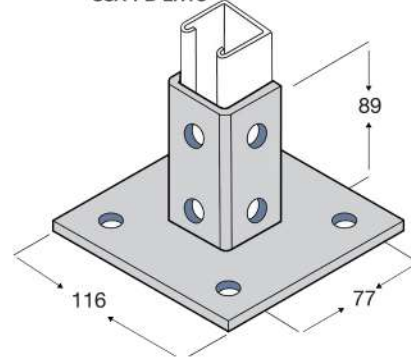
**1 HOLE SINGLE ANGLE**  
SSA-PB-ANGLE



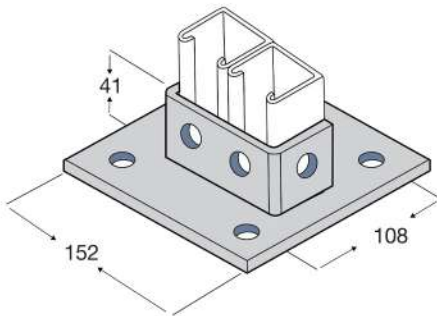
**1 HOLE SINGLE CHANNEL**  
SSA-PB-1H1C



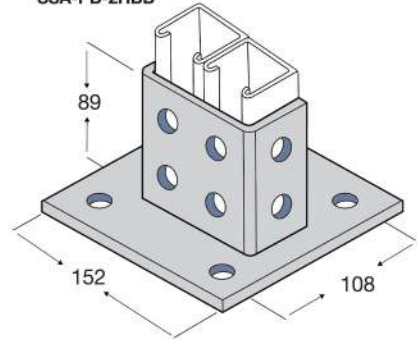
**2 HOLE SINGLE CHANNEL**  
SSA-PB-2H1C



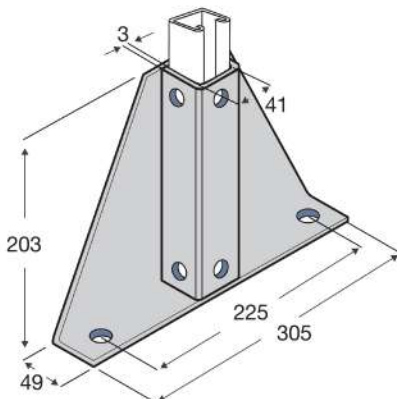
**1 HOLE DOUBLE CHANNEL**  
SSA-PB-1HBB



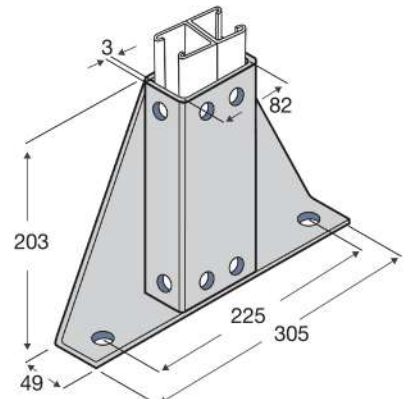
**2 HOLE DOUBLE CHANNEL**  
SSA-PB-2HBB



**2 HOLE SINGLE WING CHANNEL**  
SSA-PB-SW



**2 HOLE DOUBLE WING CHANNEL**  
SSA-PB-SWBB

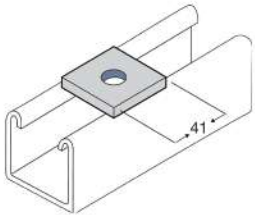


**Note** : Stainless Steel dimensions may vary from standard finish. Measurements available on request.  
 All pictures shown are for illustration purposes only. Actual products may vary due to product enhancement.

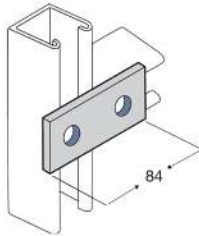
## FLAT PLATE FITTINGS

**STD DIMENSIONS** : For 41.3mm width series channel fittings.  
**STD HOLE DIA** : 10.5, 12.5mm  
**STD MATERIAL** : Hot-Roll Low-Carbon Steel (Stainless Steel 316 available on order)  
**STD FINISH** : Hot-Dipped Galvanized  
**AVAILABLE FINISH** : Zinc Plated / Pre-Galvanized / Epoxy Powder Coated / Stainless Steel 304 / 316 / 316L

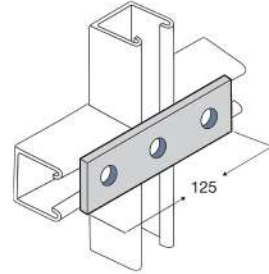
**SQUARE CHANNEL WASHER**  
SSA-SQ-WASHER



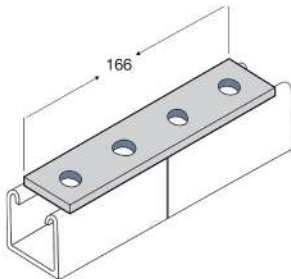
**2 HOLE SPLICE PLATE**  
SSA-FPF-2H



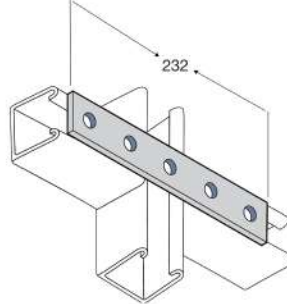
**3 HOLE SPLICE PLATE**  
SSA-FPF-3H



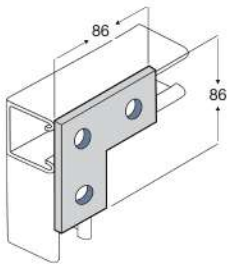
**4 HOLE SPLICE PLATE**  
SSA-FPF-4H



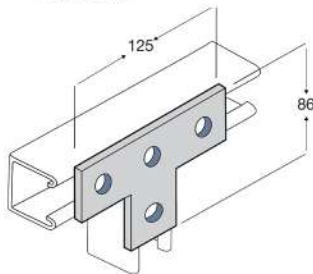
**5 HOLE SPLICE PLATE**  
SSA-FPF-5H



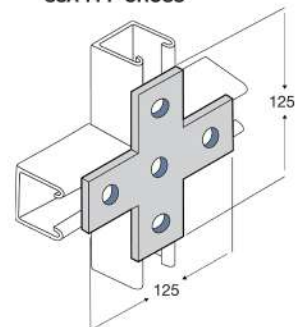
**3 HOLE HALF TEE PLATE**  
SSA-FBF-HT



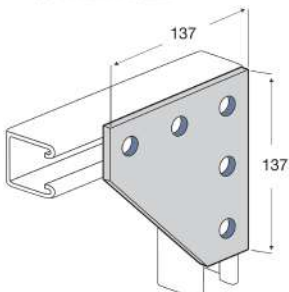
**4 HOLE TEE PLATE**  
SSA-FBF-T



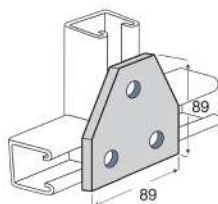
**5 HOLE CROSS PLATE**  
SSA-FPF-CROSS



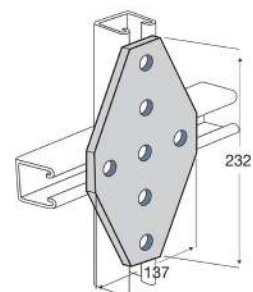
**5 HOLE CORNER ANGLED PLATE**  
SSA-FBF-ANGLE



**3 HOLE DIAGONAL HALF PLATE**  
SSA-FBF-DH



**7 HOLE DIAGONAL PLATE**  
SSA-FBF-D



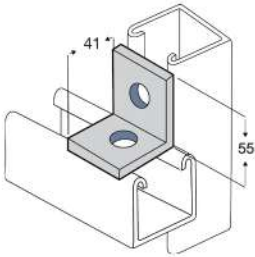
**Note** : Stainless Steel dimensions may vary from standard finish. Measurements available on request.

# SMART<sup>tr</sup> STRUT FITTINGS

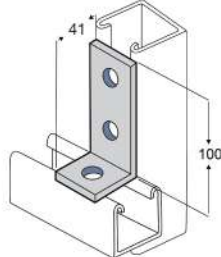
## ANGLE FITTINGS

**STD DIMENSIONS** : For 41.3mm width series channel fittings.  
**STD HOLE DIA** : 10.5, 12.5mm  
**STD MATERIAL** : Hot-Roll Low-Carbon Steel (Stainless Steel 316 available on order)  
**STD FINISH** : Hot-Dipped Galvanized  
**AVAILABLE FINISH** : Zinc Plated / Pre-Galvanized / Epoxy Powder Coated / Stainless Steel 304 / 316 / 316L

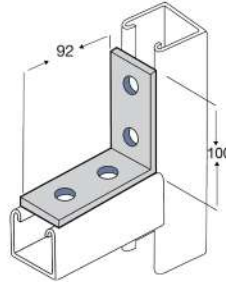
**2 HOLE CORNER ANGLE**  
SSA-AF-H11



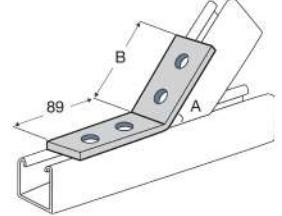
**3 HOLE CORNER ANGLE**  
SSA-AF-H21



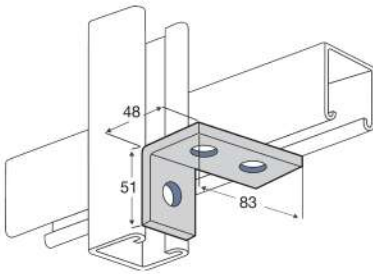
**4 HOLE CORNER ANGLE**  
SSA-AF-4CA



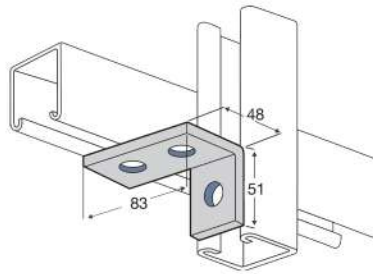
**CORNER ANGLE BEND**  
SSA-AF-D



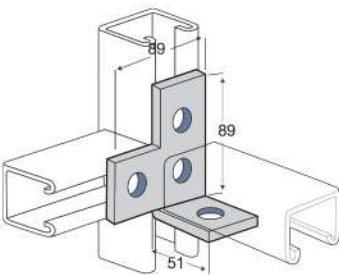
**3 HOLE HALF TEE ANGLE PLATE (RIGHT)**  
SSA-AF-3HTR



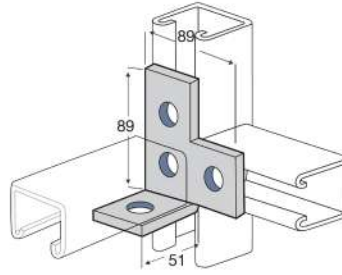
**3 HOLE HALF TEE ANGLE PLATE (LEFT)**  
SSA-AF-3HTL



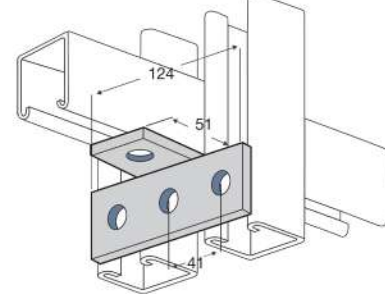
**4 HOLE ANGLE PLATE (LEFT)**  
SSA-AF-4LL



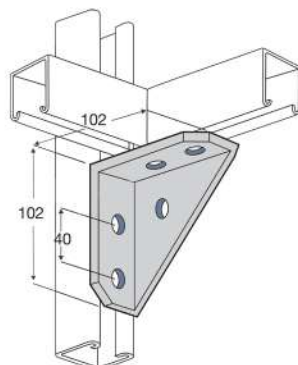
**4 HOLE ANGLE PLATE (RIGHT)**  
SSA-AF-4LR



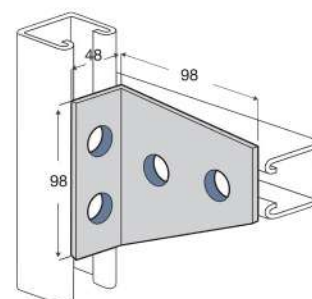
**4 HOLE TEE ANGLE PLATE**  
SSA-AF-4T



**ANGLE CORNER SUPPORT**  
SSA-ACS



**4 HOLE TRI ANGLE PLATE**  
SSA-AF-4TR



Code No.	A (rad)	B (mm)
SSA-AF-82D	1.44	
SSA-AF-75D	1.31	92
SSA-AF-67D	1.18	
SSA-AF-60D	1.05	
SSA-AF-52	0.92	
SSA-AF-45D	0.79	94
SSA-AF-37D	0.65	
SSA-AF-30D	0.52	
SSA-AF-22D	0.39	
SSA-AF-15D	0.26	96
SSA-AF-7D	0.13	

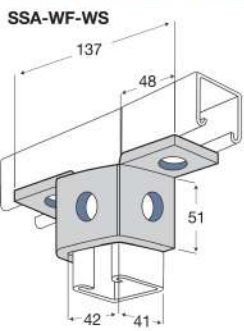
**Note** : Stainless Steel dimensions may vary from standard finish. Measurements available on request.

All pictures shown are for illustration purposes only. Actual products may vary due to product enhancement.

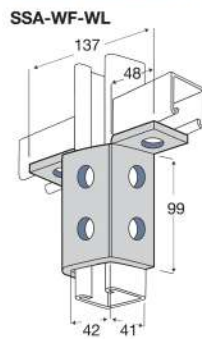
## WING FITTINGS

**STD DIMENSIONS** : For 41.3mm width series channel fittings.  
**STD HOLE DIA** : 10.5, 12.5mm  
**STD MATERIAL** : Hot-Roll Low-Carbon Steel (Stainless Steel 316 available on order)  
**STD FINISH** : Hot-Dipped Galvanized  
**AVAILABLE FINISH** : Zinc Plated / Pre-Galvanized / Epoxy Powder Coated / Stainless Steel 304 / 316 / 316L

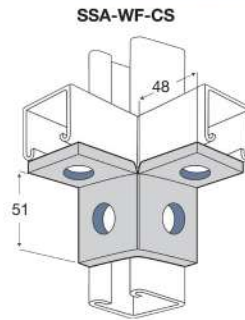
### WING SUPPORT SHORT



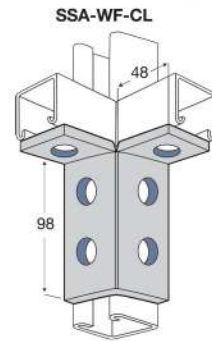
### WING SUPPORT LONG



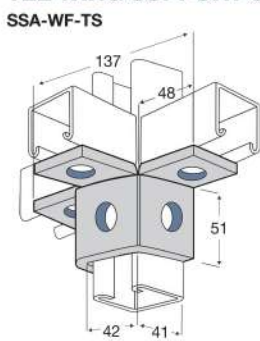
### CORNER SUPPORT SHORT



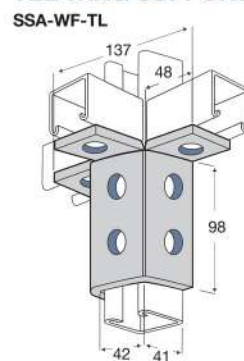
### CORNER SUPPORT LONG



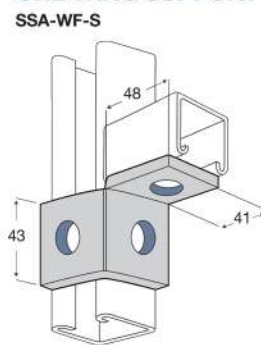
### TEE WING SUPPORT SHORT



### TEE WING SUPPORT LONG

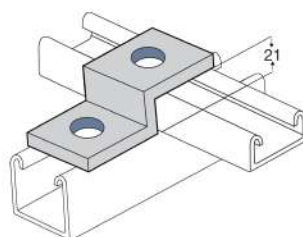


### ONE WING SUPPORT



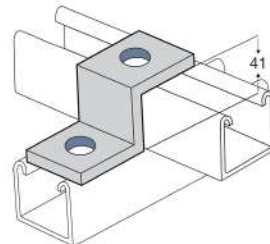
### 2 HOLE SHALLOW Z SUPPORT

SSA-FZ-2S



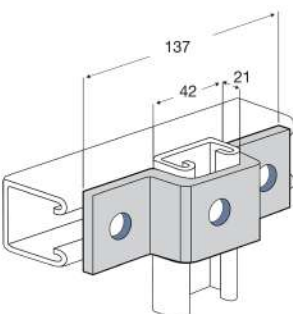
### 2 HOLE DEEP Z SUPPORT

SSA-ZF-2D



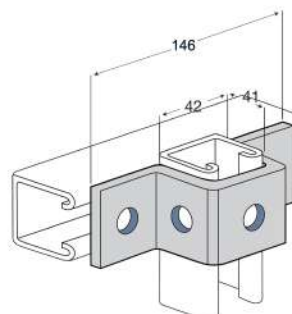
### SHALLOW U SUPPORT

SSA-UF-S



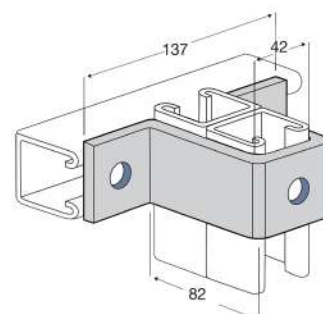
### U SUPPORT

SSA-UF-R



### DEEP U SUPPORT

SSA-UF-BB



# SMART<sup>tr</sup> CHANNEL NUTS & HARDWARE

## SPRING NUTS & WEDGE NUT

STD MATERIAL : Hot-Roll Low-Carbon Steel  
 STD FINISH : Zinc Plated  
 AVAILABLE FINISH : Hot Dipped Galvanized and Stainless Steel available on order

### CHANNEL NUT WITHOUT SPRING

Part No.	Thread Size Metric (mm)
SSA-SN-M6-O	6
SSA-SN-M8-O	8
SSA-SN-M10-O	10
SSA-SN-M12-O	12



### SHORT SPRING NUT

Part No.	Thread Size Metric (mm)
SSA-SN-M6-S	6
SSA-SN-M8-S	8
SSA-SN-M10-S	10
SSA-SN-M12-S	12



### REG. SPRING NUT

Part No.	Thread Size Metric (mm)
SSA-SN-M6	6
SSA-SN-M8	8
SSA-SN-M10	10
SSA-SN-M12	12



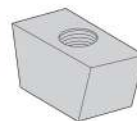
### LONG SPRING NUT

Part No.	Thread Size Metric (mm)
SSA-SN-M6-L	6
SSA-SN-M8-L	8
SSA-SN-M10-L	10
SSA-SN-M12-L	12



### WEDGE NUT

Part No.	Thread Size Metric (mm)
SSA-WN-M6	6
SSA-WN-M8	8
SSA-WN-M10	10
SSA-WN-M38	10
SSA-WN-M12	12



## BOLTS, NUTS & WASHER

STD MATERIAL : Hot-Roll Low-Carbon Steel  
 STD FINISH : Zinc Plated  
 AVAILABLE FINISH : Hot Dipped Galvanized and Stainless Steel available on order.

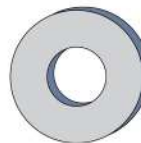
### HEX BOLT

Part No.	Thread Size Metric (mm)
SSA-HB-M6	6
SSA-HB-M8	8
SSA-HB-M10	10
SSA-HB-M12	12
SSA-HB-M16	16
SSA-HB-M20	20



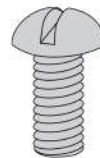
### FLAT WASHER

Part No.	Thread Size Metric (mm)
SSA-WASHER-M6	6
SSA-WASHER-M8	8
SSA-WASHER-M10	10
SSA-WASHER-M12	12
SSA-WASHER-M16	16
SSA-WASHER-M20	20



### TRUSS HEAD MACHINE SCREW

Part No.	Thread Size Metric (mm)
SSA-ROFFING BOLT-M6	6
SSA-ROFFING BOLT-M8	8
SSA-ROFFING BOLT-M10	10
SSA-ROFFING BOLT-M12	12
SSA-ROFFING BOLT-M16	16
SSA-ROFFING BOLT-M20	20



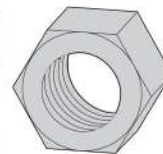
### LOCK WASHER

Part No.	Thread Size Metric (mm)
SSA-SW-M6	6
SSA-SW-M8	8
SSA-SW-M10	10
SSA-SW-M12	12
SSA-SW-M16	16
SSA-SW-M20	20



### HEX NUT

Part No.	Thread Size Metric (mm)
SSA-HN-M6	6
SSA-HN-M8	8
SSA-HN-M10	10
SSA-HN-M12	12
SSA-HN-M16	16
SSA-HN-M20	20





# SMARTr<sup>®</sup> THREADED ROD & HARDWARE

## 3X4X3-3/4 C-BRACKET

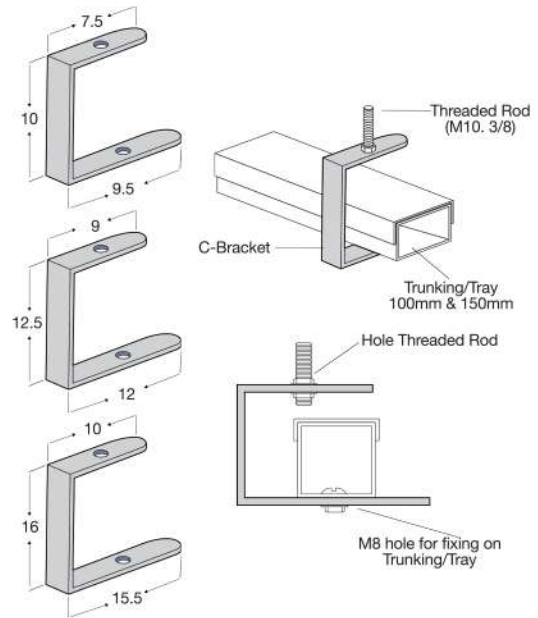
**STD MATERIAL** : Mild Steel  
**STD FINISH** : Hot-Dipped Galvanized  
**AVAILABLE FINISH** : Zinc Plated  
**STD THICKNESS** : 4mm  
**NOTE** : Suitable for hanging trunking sizes between 50x50mm  
 - Hole size suitable for 10mm or 3/8" Threaded Rods.

## 3X4X5 C-BRACKET

**STD MATERIAL** : Mild Steel  
**STD FINISH** : Hot-Dipped Galvanized  
**AVAILABLE FINISH** : Zinc Plated  
**STD THICKNESS** : 4mm  
**NOTE** : Suitable for hanging trunking sizes between 50x50mm to 100x100mm.  
 - Hole size suitable for 10mm or 3/8" Threaded Rods.

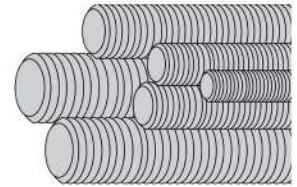
## 4X6X6 C-BRACKET

**STD MATERIAL** : Mild Steel  
**STD FINISH** : Hot-Dipped Galvanized  
**AVAILABLE FINISH** : Zinc Plated  
**STD THICKNESS** : 5mm  
**NOTE** : Suitable for hanging trunking sizes between 50x50mm to 100x150mm.  
 - Hole size suitable for 12mm or 1/2" Threaded Rods.



## THREADED RODS

**STD MATERIAL** : Hot-Roll Low Carbon Steel  
**STD FINISH** : Zinc-Plated Electro-Galvanized  
**AVAILABLE FINISH** : Stainless Steel / Hot-Dipped Galvanized  
**RANGE** : Standard sizes are available in both metric and imperial threads up to 20mm and 3/4".  
 - Larger sizes are available upon special order.  
**LENGTH** : Standard 2 metres for all metric rods. (Other lengths also available upon request)  
 - Standard 6 foot lengths for imperial rods.



Part No.	Type of Threading Metric(mm)	Allowable Load (kg)	Std Length
SSA-ROD-M6	6	112.2	2m
SSA-ROD-M8	8	204.0	
SSA-ROD-M10	10	326.3	
SSA-ROD-M12	12	479.3	
SSA-ROD-M16	16	897.4	
SSA-ROD-M20	20	1407.2	

Part No.	Type of Threading Imperial(Inch)	Allowable Load (kn)	Std Length
SSA-ROD-14	1/4"	1.1	6ft
SSA-ROD-516	5/16"	2.0	
SSA-ROD-38	3/8"	3.2	
SSA-ROD-12	1/2"	4.7	
SSA-ROD-58	5/8"	8.8	
SSA-ROD-34	3/4"	13.8	

## CONDUIT CLIP (KON CLIP)

**STD MATERIAL** : Steel  
**STD FINISH** : Hot-Dipped Galvanized

Part No.	Clip Sizes	Conduit Sizes Metric(mm)
SSA-KC-20	K20	20
SSA-KC-25	K25	25
SSA-KC-32	K32	32



## THREAD ROD COUPLER

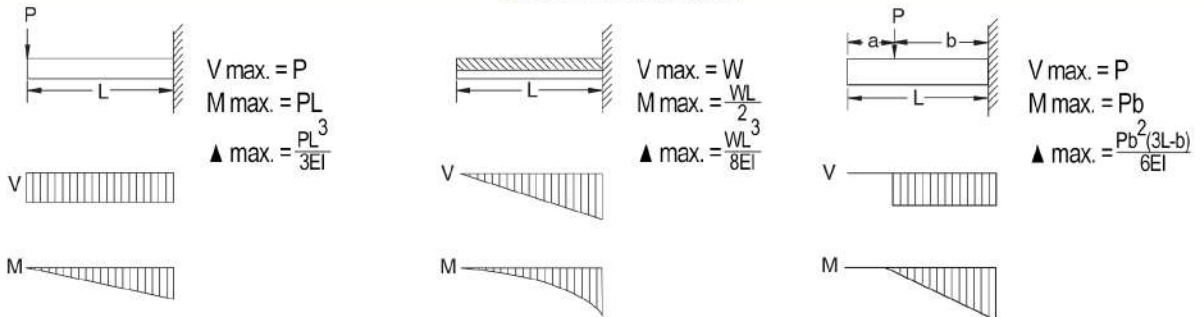
**STD MATERIAL** : Hot-Roll Low Carbon Steel  
**STD FINISH** : Electro Galvanized  
**AVAILABLE FINISH** : Hot-Dipped Galvanized

Part No.	Thread Size Metric(mm)	Clearance Hole (mm)
SSA-LN-M6	6	6
SSA-LN-M8	8	8
SSA-LN-M10	10	10
SSA-LN-M12	12	12
SSA-LN-M16	16	16
SSA-LN-M20	20	20

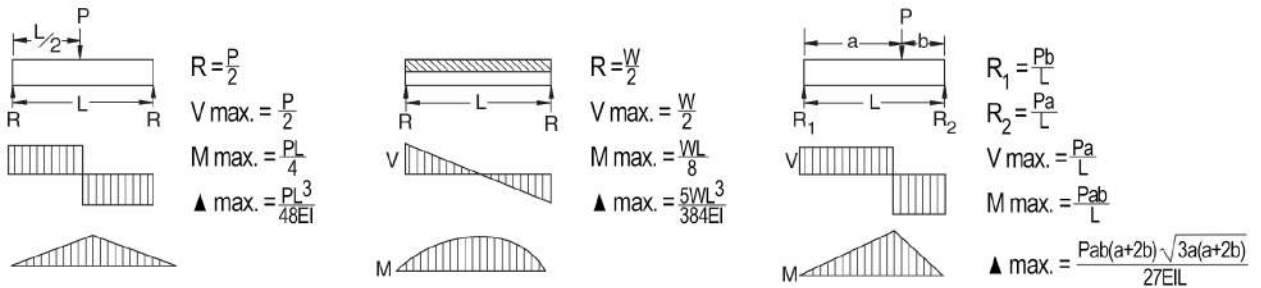


## BEAM SUPPORT CONDITIONS

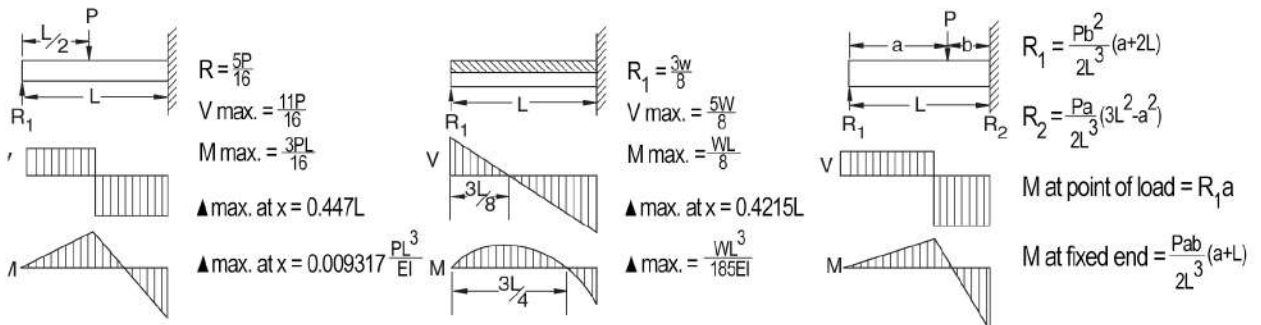
### CANTILEVER BEAMS



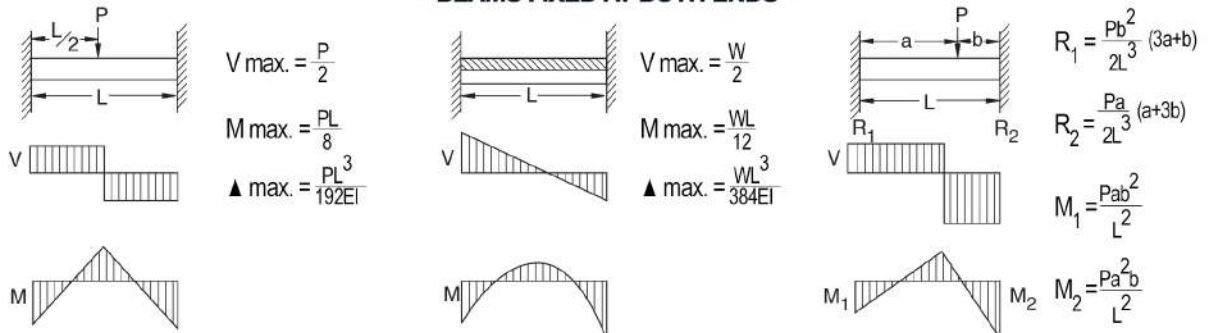
### SIMPLE BEAMS



### BEAMS FIXED AT ONE END & SUPPORTED AT THE OTHER



### BEAMS FIXED AT BOTH ENDS



R - Reaction  
M - Moment  
P - Concentrated Load


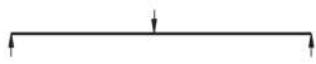
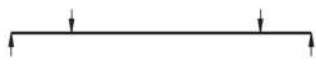
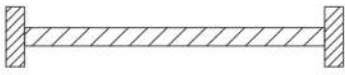
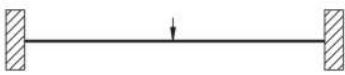

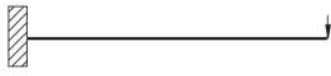
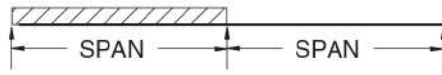
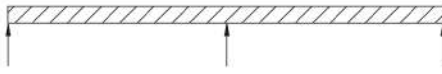


W - Total Uniform Load  
V - Shear  
L - Length

Δ - Deflection  
E - Modulus of Elasticity  
I - Moment of Inertia

# CONVERSION FACTORS FOR BEAMS WITH VARIOUS STATIC

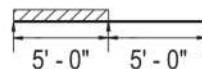
All Beam Load tables are for single-span (simple) beams supported at the ends. These can be used in majority of the cases. However, there are times when it is necessary to know what happens with other loading and support conditions. Some common arrangements are shown below. Simply multiply the values from the Beam Load tables by factors given below.

### REFERENCE TABLES AND DATA

Load and Support Condition		Load Factor	Deflection Factor
1.	Simple Beam, Uniform Load 	1.00	1.00
2.	Simple Beam, Concentrated Load at Center 	.50	.80
3.	Simple Beam, Two Equal Concentrated Loads at 1/4 pts 	1.00	1.10
4.	Beam Fixed at Both Ends, Uniform Load 	1.50	1.10
5.	Beam Fixed at Both Ends, Concentrated Load at Center 	1.00	1.10
6.	Cantilever Beams, Uniform Load 	.25	2.40
7.	Cantilever Beams, Concentrated Load at End 	.12	3.20
8.	Continuous Beam, Two Equal Spans, Uniform Load on One Span 	1.30	.92
9.	Continuous Beam, Two Equal Spans, Uniform Load on Both Ends 	1.00	.42
10.	Continuous Beam, Two Equal Spans, Concentrated Load at Center of One Span 	.62	.71
11.	Continuous Beam, Two Equal Spans, Concentrated Load at Center of Each Span 	.67	.48

#### Example:

Determine load and deflection of a SS-4141-25 beam continuous over one support and loaded uniformly on one span.



- From load table for SS-4141-25, load for a 1500mm span is 309kg and deflection is 15mm.
- Multiply by factors from Table above.  
Load = 309kg x 1.30 = 401.7  
Deflection = 15mm x 0.92 = 13.8

## ENGLISH TO METRIC

TO CONVERT FROM TO MULTIPLY BY

### LENGTH

Inch (in)	Millimeter (mm)	24.400 000
Foot (ft)	Meter (m)	0.304 800
Yard (yd)	Meter (m)	0.914 400
Mile (mi) (U.S. Statute)	Kilometer (km)	1.609 347

### AREA

Square Inch (in <sup>2</sup> )	Square Millimeter (mm <sup>2</sup> )	645.16
Square Foot (ft <sup>2</sup> )	Square Meter (m <sup>2</sup> )	0.092 903
Square Yard (yd <sup>2</sup> )	Square Meter (m <sup>2</sup> )	0.836 127
Square Mile (mi <sup>2</sup> ) (U.S. Statute)	Square Kilometer (km <sup>2</sup> )	2.589 998
Acre	Square Meter (m <sup>2</sup> )	4046.873
Acre	Hectare	0.404 687

### VOLUME

Cubic Inch (in <sup>3</sup> )	Cubic Millimeter (mm <sup>3</sup> )	16387.06
Cubic Foot (ft <sup>3</sup> )	Cubic Meter (m <sup>3</sup> )	0.028 317
Cubic Yard (yd <sup>3</sup> )	Cubic Meter (m <sup>3</sup> )	0.764 555
Gallon (gal) (U.S. Liquid)	Litre (l)	3.785 412
Quart (qt) (U.S. Liquid)	Litre (l)	0.945 353

### MASS

Ounce (Avoirdupois) (oz)	Gram (g)	28.349520
Pound (Avoirdupois) (lb)	Kilogram (kg)	0.453 592
Short Ton	Kilogram (kg)	907.185

### FORCE

Ounce-Force	Newton (N)	0.278 014
Pound-Force (lbf)	Newton (N)	4.448 222

### BENDING MOMENT

Ounce-Force-Inch (lbf-in)	Newton-Meter (N-m)	0.112 985
Pound-Force-Foot (lbf-ft)	Newton-Meter (N-m)	1.355 818

### PRESSURE, STRESS

Pound-Force per Square Inch (lbf/in <sup>2</sup> )	Kilopascal (kPa)	6.894 757
Foot of Water (39.2 F)	Kilopascal (kPa)	2.988 980
Inch of Mercury (32 F)	Kilopascal (kPa)	3.386 380

### ENERGY, WORK, HEAT

Foot-Pound-Force (ft-lbf)	Joule (J)	1.355 818
British Thermal Unit (Btu)	Joule (J)	1055.056
Calorie (cal)	Joule (J)	4.186 800
Kilowatt Hour (kW-h)	Joule (J)	3.600,000

### POWER

Foot-Pound-Force /Second (ft-lbs/s)	Watt (W)	1.355 818
British Thermal Unit /Hour (Btu/h)	Watt (W)	0.293 071
Horsepower (hp) (550 Ft. Lbf/s)	Kilowatt (kW)	0.745 700

### POWER

Degree	Radian (rad)	0.017 453
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### TEMPERATURE

Degree Fahrenheit (°F)	Degree Celsius (°C)	(°F - 32)/1.8
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## METRIC TO ENGLISH

TO CONVERT FROM TO MULTIPLY BY

### LENGTH

Millimeter (mm)	Inch (in)	0.039 370
Meter (m)	Foot (ft)	3.280 840
Meter (m)	Yard (yd)	1.093 613
Kilometer (km)	Mile (mi) (U.S. Statute)	0.621 370

### AREA

Square Millimeter (mm <sup>2</sup> )	Square Inch (in <sup>2</sup> )	0.001550
Square Meter (m <sup>2</sup> )	Square Foot (ft <sup>2</sup> )	10.763 915
Square Meter (m <sup>2</sup> )	Square Yard (yd <sup>2</sup> )	1.195 991
Square Kilometer (km <sup>2</sup> )	Square Mile (mi <sup>2</sup> ) (U.S. Statute)	0.386 101
Square Meter (m <sup>2</sup> )	Acre	0.000 247
Hectare	Acre	2.471 046

### VOLUME

Cubic Millimeter (mm <sup>3</sup> )	Cubic Inch (in <sup>3</sup> )	0.000061
Cubic Meter (m <sup>3</sup> )	Cubic Foot (ft <sup>3</sup> )	35.314 662
Cubic Meter (m <sup>3</sup> )	Cubic Yard (yd <sup>3</sup> )	1.307 950
Litre (l)	Gallon (gal) (U.S. Liquid)	0.264 172
Litre (l)	Quart (qt) (U.S. Liquid)	1.056 688

### MASS

Gram (g)	Ounce (Avoirdupois) (oz)	0.035 274
Kilogram (kg)	Pound (Avoirdupois) (lb)	2.204 624
Kilogram (kg)	Short Ton	0.00110

### FORCE

Newton (N)	Ounce-Force	3.596 941
Newton (N)	Pound-Force (lbf)	0.224 809

### BENDING MOMENT

Newton-Meter (N-m)	Ounce-Force-Inch (lbf-in)	8.850 732
Newton-Meter (N-m)	Pound-Force-Foot (lbf-ft)	0.737 562

### PRESSURE, STRESS

Kilopascal (kPa)	Pound-Force per Square Inch (lbf/in <sup>2</sup> )	0.145 038
Kilopascal (kPa)	Foot of Water (39.2 F)	0.334 562
Kilopascal (kPa)	Inch of Mercury (32 F)	0.295 301

### ENERGY, WORK, HEAT

Joule (J)	Foot-Pound-Force (ft-lbf)	0.737 563
Joule (J)	British Thermal Unit (Btu)	0.000948
Joule (J)	Calorie (cal)	0.238 846
Joule (J)	Kilowatt Hour (kW-h)	2.78 <sup>-7</sup>

### POWER

Watt (W)	Foot-Pound-Force /Second (ft-lbs/s)	0.737 562
Watt (W)	British Thermal Unit /Hour (Btu/h)	3.4212 142
Kilowatt (kW)	Horsepower (hp) (550 Ft. Lbf/s)	1.341 022

### POWER

Radian (rad)	Degree	57.295 788
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### TEMPERATURE

Degree Celsius (°C)	Degree Fahrenheit (°F)	1.8x°C+32
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Electrical & Mechanical Support

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