

Unison Strut Channel



 **UNISON eTech**
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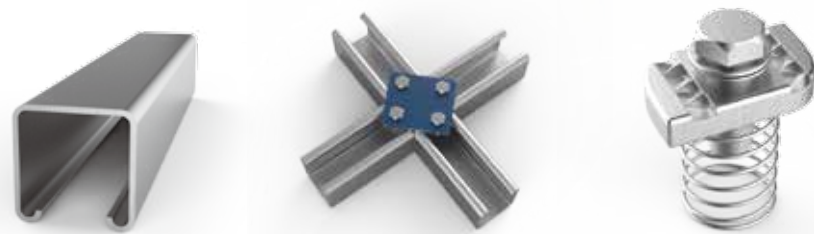
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TEL : 041)620-3333, FAX : 041)551-0706, E-mail : unisonetech@uet.co.kr

 **UNISON eTech**
www.unisonetech.com

Industrial plant design to maintenance,

UNISON eTech

is a specialized plant parts manufacturer who provides comprehensive service through continuous research and development.



Conducts business in national key industries such as nuclear power plant and thermal power plant, basic industry such as petrochemical plant, heavy industry such as steel and LNG storage tank.

In addition, we are also involved in a higher value-added business which design, manufacture and supply Pipe Support for FPSO (Floating Production Storage Offloading).

Customer Satisfaction

We provide customer satisfaction through prompt response to clients, perfect design and best delivery

Top Grade Quality Control

We maintain the highest quality through ISO 9001 for the first time in this field, also get ASME-NS, NPT and KEPIC-MN.

Innovative Product Improvement

We offer One Stop Service immediately in order to provide high quality specified products to satisfy customers.

Unison Strut Channel

Unison Strut Channel is support beam which is used for communication and electricity cable tray in building and plant. The main advantage of strut channel in construction is that there are many options available for rapidly and easily connecting lengths together and other items to the strut channel, using various specialized strut-specific fastens and bolts.



**Fast & Easy
Installation**

Modular System

Cable way, Duct, Pipe,
Access Floor

Modify Reworks



No Welding

Without Burn Damage
Floor No Damage

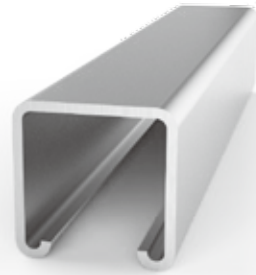
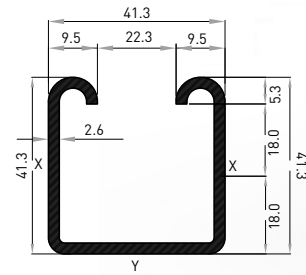


**Work Without
Rework**

Unison Strut Channel

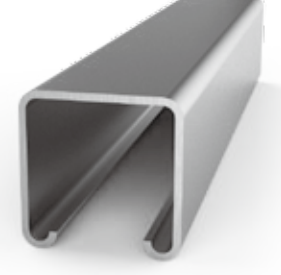
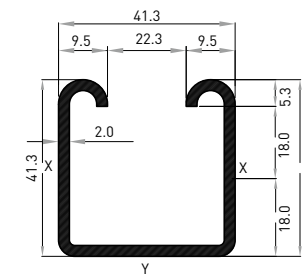
UN100 TYPE : 41mm Single Channel

- Material : SS400, A36, SA 36
- Thickness : 2.6 mm
- Standard Length : 3.0m & 4.5m & 6.0m
- Standard Finished : Hot-Dipped Galvanizing
- Weight : 2.85 kg / m



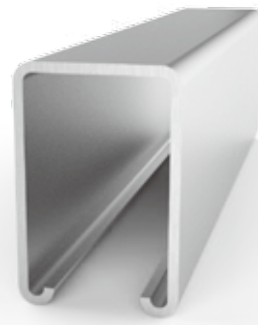
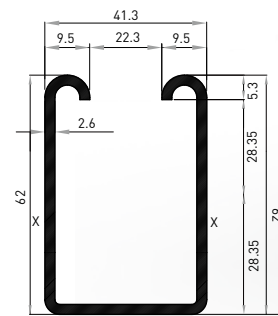
UN100-SU TYPE : 41mm Single Channel SUS316L

- Material : SUS316L, A240TP304, SA240TP304, A240TP316L, SA240TP316L
- Thickness : 2.0 mm
- Standard Length : 3.0m & 4.5m
- Weight : 2.07 kg / m



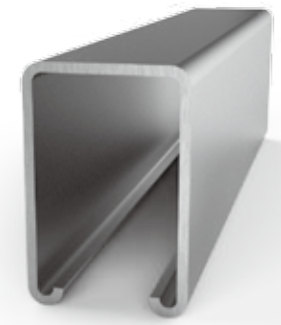
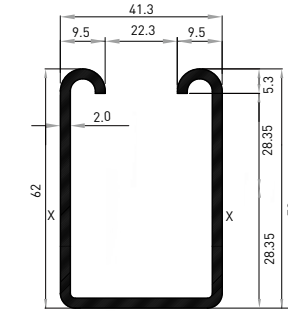
UN550 TYPE : 62mm Single Channel

- Material : SS400, A36, SA 36
- Thickness : 2.6 mm
- Standard Length : 3.0m & 4.5m & 6.0m
- Standard Finished : Hot-Dipped Galvanizing
- Weight : 3.8 kg / m



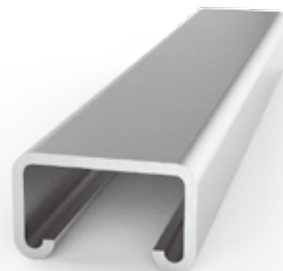
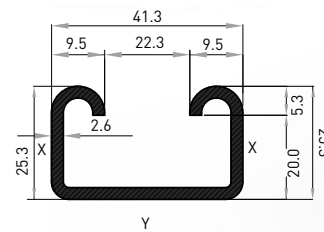
UN550-SU TYPE : 62mm Single Channel

- Material : SUS316L, A240TP304, SA240TP304, A240TP316L, SA240TP316L
- Thickness : 2.0 mm
- Standard Length : 3.0m & 4.5m
- Weight : 2.76 kg / m



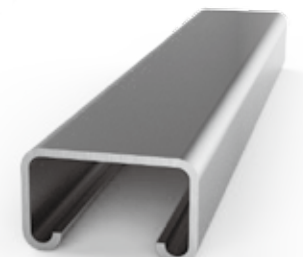
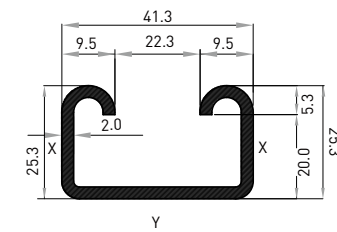
UN250 TYPE : 25mm Single Channel

- Material : SS400, A36, SA 36
- Thickness : 2.6 mm
- Standard Length : 3.0m & 4.5m
- Standard Finished : Hot-Dipped Galvanizing
- Weight : 1.89 kg / m



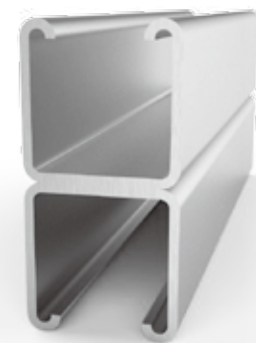
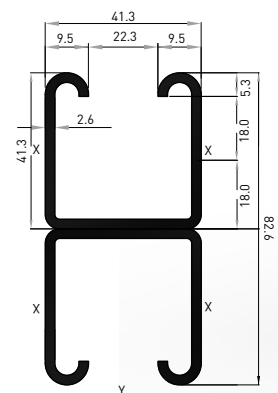
UN250-SU TYPE : 25mm Single Channel SUS316L

- Material : SUS316L, A240TP304, SA240TP304, A240TP316L, SA240TP316L
- Thickness : 2.0 mm
- Standard Length : 3.0m & 4.5m
- Weight : 1.76 kg / m



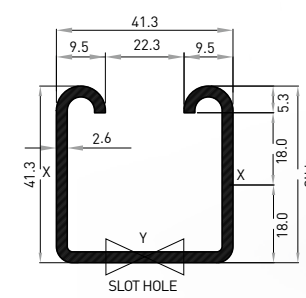
UN101 TYPE : 82mm Double Channel

- Material : SS400, A36, SA 36
- Thickness : 2.6 mm
- Standard Length : 3.0m & 4.5m & 6.0m
- Standard Finished : Hot-Dipped Galvanizing
- Weight : 5.7 kg / m



UN100B TYPE : 41mm Single Channel-Backhole Type

- Material : SS400, A36, SA 36
- Thickness : 2.6 mm
- Standard Length : 3.0m & 4.5m & 6.0m
- Standard Finished : Hot-Dipped Galvanizing
- Weight : 2.73 kg / m

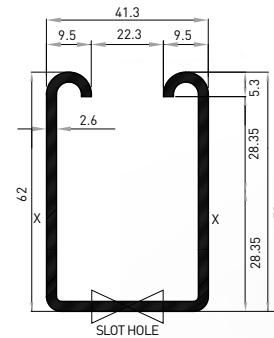


Unison Strut Channel

UN550B TYPE :

62mm Single Channel-Backhole Type

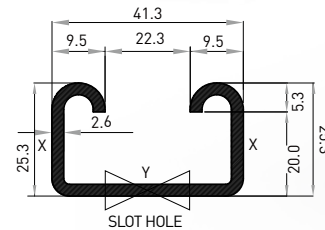
- Material : SS400, A36, SA 36
- Thickness : 2.6 mm
- Standard Length : 3.0m & 4.5m & 6.0m
- Standard Finished : Hot-Dipped Galvanizing
- Weight : 3.68 kg / m



UN250B TYPE :

25mm Single Channel-Backhole Type

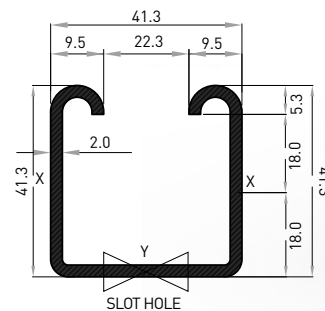
- Material : SS400, A36, SA36
- Thickness : 2.6 mm
- Standard Length : 3.0m & 4.5m
- Standard Finished : Hot-Dipped Galvanizing
- Weight : 1.815 kg / m



UN100B-SU TYPE :

41mm Single Channel SUS316L-Backhole Type

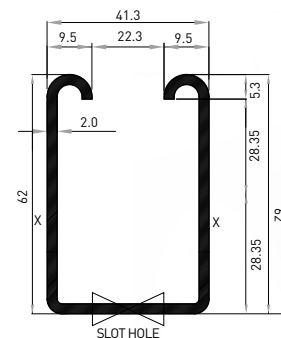
- Material : SUS316L, A240TP304, SA240TP304, A240TP316L, SA240TP316L
- Thickness : 2.0 mm
- Standard Length : 3.0m & 4.5m
- Weight : 1.95 kg / m



UN550B-SU TYPE :

62mm Single Channel-Backhole Type

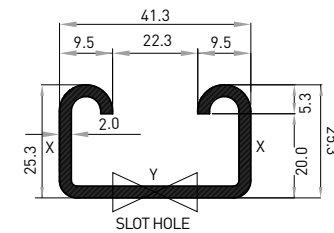
- Material : SUS316L, A240TP304, SA240TP304, A240TP316L, SA240TP316L
- Thickness : 2.0 mm
- Standard Length : 3.0m & 4.5m
- Weight : 2.64 kg / m



UN250B-SU TYPE :

25mm Single Channel SUS316L-Backhole Type

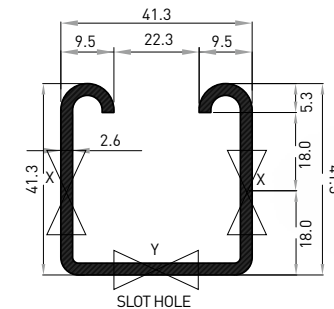
- Material : SUS316L, A240TP304, SA240TP304, A240TP316L, SA240TP316L
- Thickness : 2.0 mm
- Standard Length : 3.0m & 4.5 mm
- Weight : 1.76 kg / m



UN100B-B3 TYPE :

41mm Single Channel-3 Backhole Type

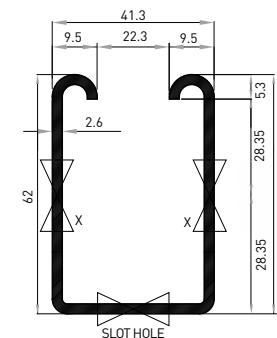
- Material : SS400, A36, SA36
- Thickness : 2.6mm
- Length : 3.0m & 4.5m & 6.0m
- Standard Finished : Hot-Dipped Galvanizing
- Weight : 2.49 kg / m



UN550B-B3 TYPE :

62mm Single Channel -3 Backhole Type

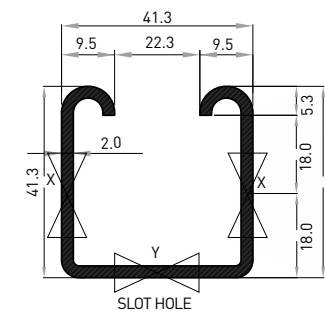
- Material : SS400, A36, SA36
- Thickness : 2.6 mm
- Length : 3.0m & 4.5m & 6.0m
- Standard Finished : Hot-Dipped Galvanizing
- Weight : 3.44 kg / m



UN100B-SU-B3 TYPE :

41mm Single Channel SUS316L-3 Backhole Type

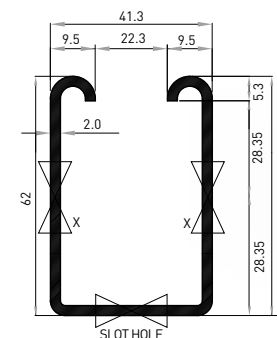
- Material : SUS316L, A240TP304, SA240TP304, A240TP316L, SA240TP316L
- Thickness : 2.0 mm
- Length : 3.0m & 4.5m
- Weight : 1.71 kg / m



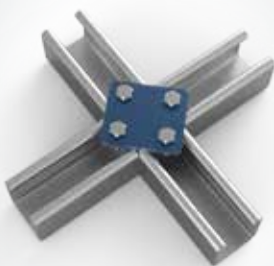
UN550B-SU-B3 TYPE :

62mm Single Channel SUS316L-3 Backhole Type

- Material : SUS316L, A240TP304, SA240TP304, A240TP316L, SA240TP316L
- Thickness : 2.0 mm
- Length : 3.0m & 4.5m
- Weight : 2.4 kg / m



Unison Strut Fittings



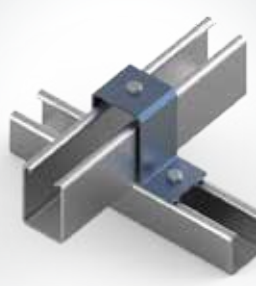
UNF-01



UNF-02



UNF-02-A



UNF-07-A



UNF-08



UNF-09



UNF-03



UNF-03S



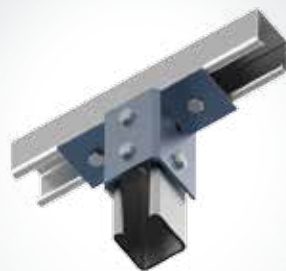
UNF-04



UNF-10



UNF-11



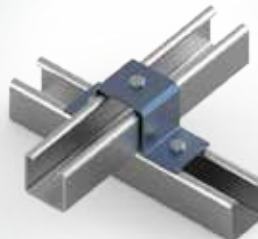
UNF-12



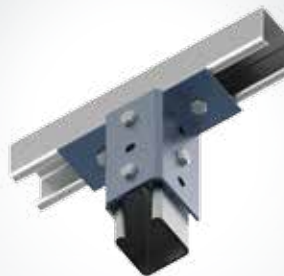
UNF-05



UNF-06



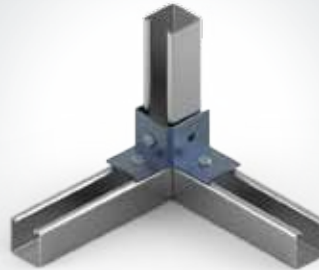
UNF-07



UNF-13



UNF-14

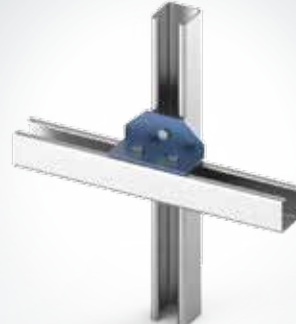


UNF-15

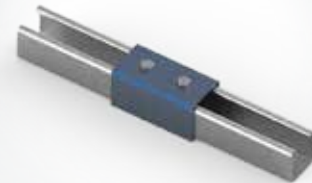
Unison Strut Fittings



UNF-16



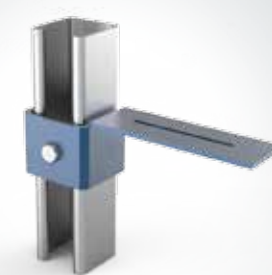
UNF-17



UNF-18



UNF-25



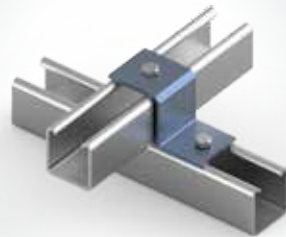
UNF-26



UNF-27



UNF-19



UNF-20



UNF-21



UNF-28



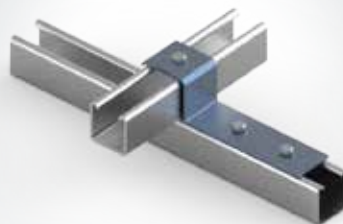
UUP-01



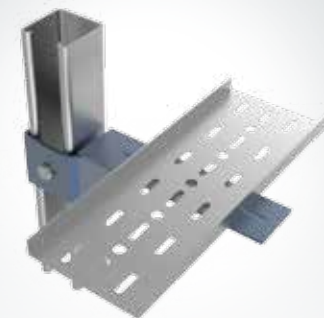
UUP-02



UNF-22



UNF-23



UNF-24



UUP-03



UUP-04



UUP-05

Unison Strut Channel Bolt & Washer

Bolt

- Material : A307GR.A, SA307GR.A, A193GR.B8, SA193GR.B8, A193GR.B8M, SA193GR.B8M
- Standard Finish : Galv'd(Carbon)



Thread Size	Part No.	Length
M6	UNHB-M6	30L / 35L
M8	UNHB-M8	30L / 35L
M10	UNHB-M10(STANDARD)	25L / 30L / 80L
M12	UNHB-M12	30L

Washer

- Material : A36, SA36, SUS316L, A240TP304, SA240TP304, A240TP316L, SA240TP316L
- Standard Finish : Galv'd(Carbon)



Thread Size	Part No.
M6	UNPW-M6
	UNSW-M6
M8	UNPW-M8
	UNSW-M8
M10	UNPW-M10(STANDARD)
	UNSW-M10(STANDARD)
M12	UNPW-M12
	UNSW-M12

Unison Strut Channel Nut

Spring Nut

- Material : A563GR.A, SA563GR.A, A194GR.8, SA194GR.8, A194GR.8M, SA194GR.8M
- Standard Finish : Galv'd(Carbon)



Thread Size	Part No.	Length
M6	UNSN-M6	3.10
M8	UNSN-M8	3.18
M10	UNSN-M10(STANDARD)	4.12
M12	UNSN-M12	5.50

Strut Nut

- Material : A563GR.A, SA563GR.A, A194GR.8, SA194GR.8, A194GR.8M, SA194GR.8M
- Standard Finish : Galv'd(Carbon)



Thread Size	Part No.	Length
M6	UNCN-M6	2.85
M8	UNCN-M8	3.05
M10	UNCN-M10(STANDARD)	3.95
M12	UNCN-M12	5.0

Unison Strut Channel Clamp

Pipe Clamp

- Material : SS400, A36, SA36, A240TP304, SA240TP304, A240TP316L, SA240TP316L, SA240TP316L
- Standard Finish : Galv'd(Carbon)



Part No.	Conduit Size		Material Thickness		Weight(kg)
UNF-901-10	3/8"	(10 A)	16 Ga.	(1.6t)	0.45
UNF-901-15	1/2"	(15 A)	16 Ga.	(1.6t)	0.50
UNF-901-20	3/4"	(20 A)	14 Ga.	(2.0t)	0.68
UNF-901-25	1"	(25 A)	14 Ga.	(2.0t)	0.72
UNF-901-32	1 1/4"	(32 A)	14 Ga.	(2.0t)	0.91
UNF-901-40	1 1/2"	(40 A)	12 Ga.	(2.6t)	1.36
UNF-901-50	2"	(50 A)	12 Ga.	(2.6t)	1.54
UNF-901-65	2 1/2"	(65 A)	12 Ga.	(2.6t)	1.72
UNF-901-80	3"	(80 A)	12 Ga.	(2.6t)	1.99

Pipe Clamp Strap

- Material : SS400, A36, SA36, A240TP304, SA240TP304, A240TP316L, SA240TP316L, SA240TP316L
- Standard Finish : Galv'd(Carbon)



Part No.	Pipe Size			Material Thickness		Weight(kg)
UNF-902-05	1/2"	(15 A)	(21.7)	10 Ga.	(3.2t)	0.11
UNF-902-10	3/4"	(20 A)	(27.2)	10 Ga.	(3.2t)	0.12
UNF-902-15	1"	(25 A)	(34)	10 Ga.	(3.2t)	0.14
UNF-902-20	1 1/4"	(32 A)	(42.7)	10 Ga.	(3.2t)	0.16
UNF-902-25	1 1/2"	(40 A)	(48.6)	10 Ga.	(3.2t)	0.18
UNF-902-30	2"	(50 A)	(60.5)	3 Ga.	(6.0t)	0.42
UNF-902-40	2 1/2"	(65 A)	(76.3)	3 Ga.	(6.0t)	0.48

Spiral Duct Clamp

- Material : SS400, A36, SA36, A240TP304, SA240TP304, A240TP316L, SA240TP316L, SA240TP316L
- Standard Finish : Galv'd(Carbon)



Part No.	Clamp Dia.	Material Thickness	Weight (kg)	Part No.	Clamp Dia.	Material Thickness	Weight (kg)
UNF-903-R80	Φ89	2.0t	1.3	UNF-903-PR80	Φ123	2.0t	1.7
UNF-903-R100	Φ109	2.0t	1.5	UNF-903-PR100	Φ143	2.0t	1.85
UNF-903-R125	Φ134	2.0t	1.8	UNF-903-PR125	Φ163	2.0t	1.95
UNF-903-R160	Φ169	2.0t	1.95	UNF-903-PR160	Φ203	2.0t	2.25
UNF-903-R200	Φ209	2.0t	2.28	UNF-903-PR200	Φ243	2.0t	2.38
UNF-903-R250	Φ259	2.0t	2.4	UNF-903-PR250	Φ293	2.0t	2.58
UNF-903-R315	Φ325	2.0t	2.87	UNF-903-PR315	Φ358	2.0t	3.0

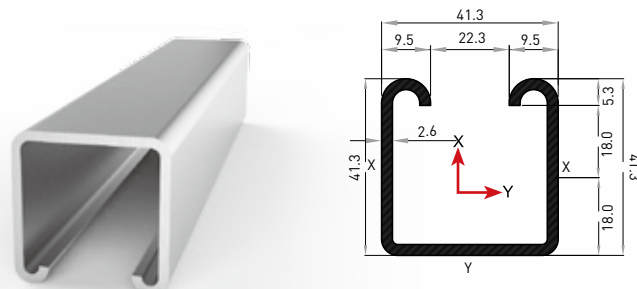
Unison Strut Channel Plastic End Cap



Part No.	Material	Color
UNF801	Polyurethane	Gray

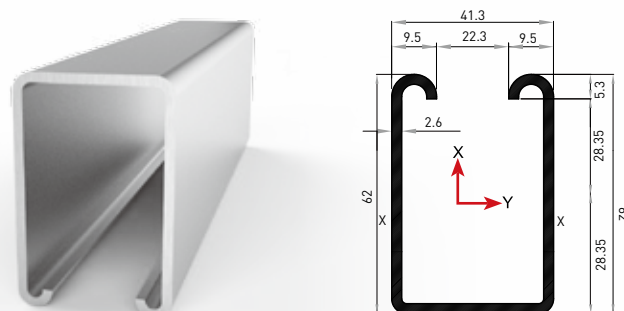
Technical Data

41mm Single Channel UN100 Type



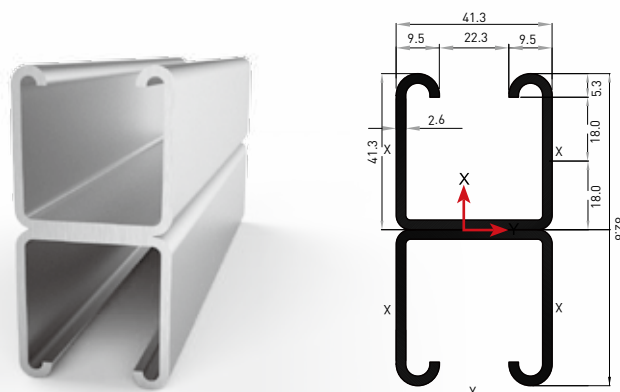
Properties		
Material		SS400
F _y [kgf/mm ²]	Minimum yield strength	24.0
Ω	Safety factor	1.67
A [mm ²]	Cross section	325.3
I _{xx} [mm ⁴]	Area moment of inertia	67252.0
Y [mm]	Distance from neutral axis to outer section	24.1

62mm Single Channel UN550 Type



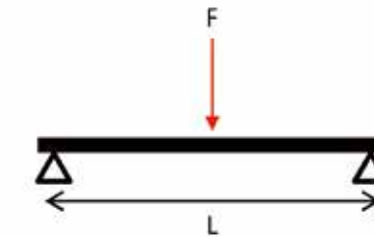
Properties		
Material		SS400
F _y [kgf/mm ²]	Minimum yield strength	24.0
Ω	Safety factor	1.67
A [mm ²]	Cross section	432.9
I _{xx} [mm ⁴]	Area moment of inertia	192680.6
Y [mm]	Distance from neutral axis to outer section	35.0

82mm Double Channel UN101 Type



Properties		
Material		SS400
F _y [kgf/mm ²]	Minimum yield strength	24.0
Ω	Safety factor	1.67
A [mm ²]	Cross section	650.6
I _{xx} [mm ⁴]	Area moment of inertia	327008.0
Y [mm]	Distance from neutral axis to outer section	41.3

Concentrated Load – One Point



Calculation

L	: Span Length [mm]	Ω	: Safety Factor(=1.67)
A	: Cross Section [mm ²]	M _{sw}	: Bending Moment (Self Weight) [kgf-mm]
I _{xx}	: Area Moment of Inertia [mm ⁴]	M _b	: Bending Moment (Load) [kgf-mm]
y	: Distance from Neutral Axis to Outer Section [mm]	σ _a	: Allowable Bending Stress [kgf/mm ²]
Z	: Section Modulus [mm ³]	σ _{sw+b}	: Total Bending Stress [kgf/mm ²]
P _{sw}	: Self Weight [kg/m]	δ _{sw}	: Displacement (Self Seight) [mm]
F _y	: Yield Strength (Steel) [kgf/mm ²]	δ _b	: Displacement (Load) [mm]
ρ _{steel}	: Density (Steel) (=7850kgf/m ³)	δ _{sw+b}	: Total Displacement [mm]
E	: Modulus of Elasticity (Steel) [kgf/mm ²]		

Example) Section Type = UN100
L = 1000 mm
F = 158.85 kgf

- Stress -

$$F_y = \frac{235 \text{ Mpa}}{9.81 \text{ m/s}^2} = 23.96 \text{ kgf/mm}^2$$

$$\sigma_s = \frac{F_y}{\Omega} = \frac{23.96 \text{ kgf/mm}^2}{1.67} = 14.34 \text{ kgf/mm}^2$$

$$Z = \frac{I_{xx}}{y} = \frac{67251.95 \text{ mm}^4}{24.10 \text{ mm}} = 2790.68 \text{ mm}^3$$

$$P_{sw} = \rho_{steel} \cdot A = 7850 \text{ kgf/m}^3 \cdot 325.31 \text{ mm}^2 \cdot \frac{1 \text{ m}}{(1000 \text{ mm})^3} = 2.55 \text{ kg/m}$$

$$M_{sw} = \frac{P_{sw} \cdot L^2}{8} = \frac{2.55 \text{ kg/m} \cdot \left(\frac{1 \text{ m}}{1000 \text{ mm}}\right) \cdot (1000 \text{ mm})^2}{8} = 319.21 \text{ kgf} \cdot \text{mm}$$

$$M_b = \frac{F \cdot L}{4} = \frac{158.85 \text{ kgf} \cdot 1000 \text{ mm}}{4} = 39711.38 \text{ kgf} \cdot \text{mm}$$

$$\sigma_{sw+b} = \frac{M_{sw} + M_b}{Z} = \frac{319.21 \text{ kgf} \cdot \text{mm} + 39711.38 \text{ kgf} \cdot \text{mm}}{2790.68 \text{ mm}^3} = 14.34 \text{ kgf/mm}^2$$

$$\sigma_{sw+b} < \sigma_s \Rightarrow 14.344396 \text{ kgf/mm}^2 < 14.344400 \text{ kgf/mm}^2 \dots \text{O.K.}$$

- Displacement -

$$\delta_{sw} = \frac{5 \cdot P_{sw} \cdot L^4}{384 \cdot E \cdot I_{xx}} = \frac{5 \cdot 2.55 \text{ kg/m} \cdot \left(\frac{1 \text{ m}}{1000 \text{ mm}}\right)^4 \cdot 1000 \text{ mm}^4}{384 \cdot 20904.20 \text{ kgf/mm}^2 \cdot 67251.95 \text{ mm}^4} = 0.02 \text{ mm}$$

$$\delta_b = \frac{F \cdot L^3}{48 \cdot E \cdot I_{xx}} = \frac{158.85 \text{ kgf} \cdot 1000 \text{ mm}^3}{48 \cdot 20904.20 \text{ kgf/mm}^2 \cdot 67251.95 \text{ mm}^4} = 2.35 \text{ mm}$$

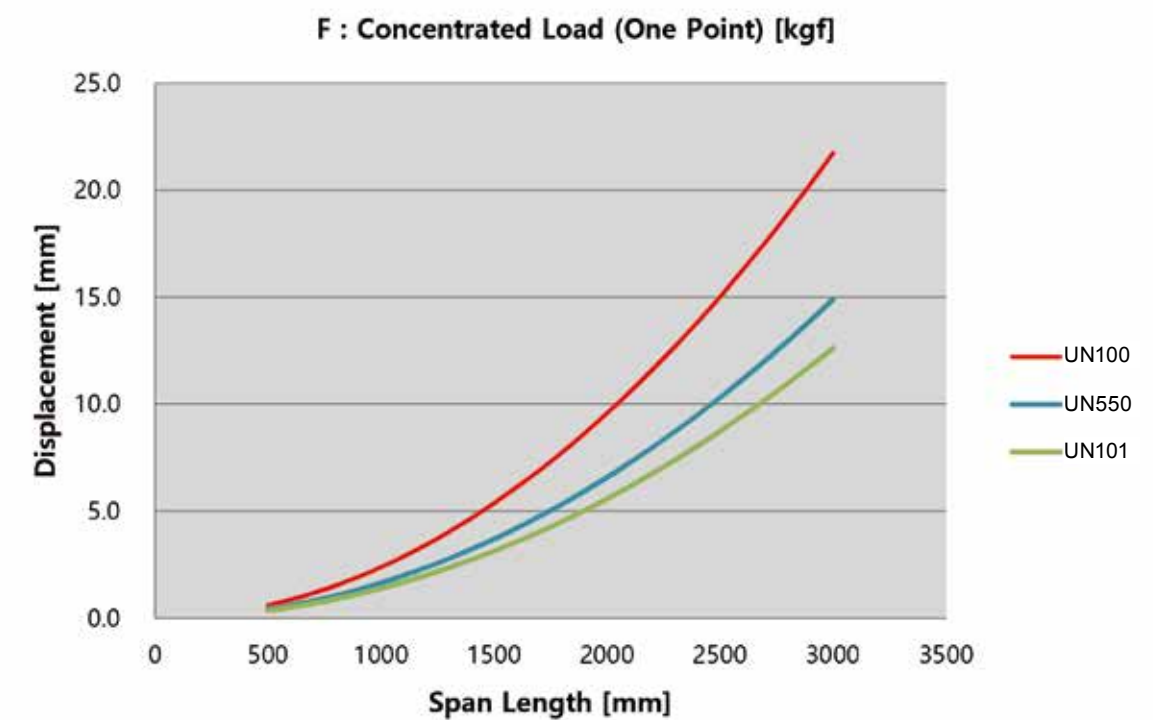
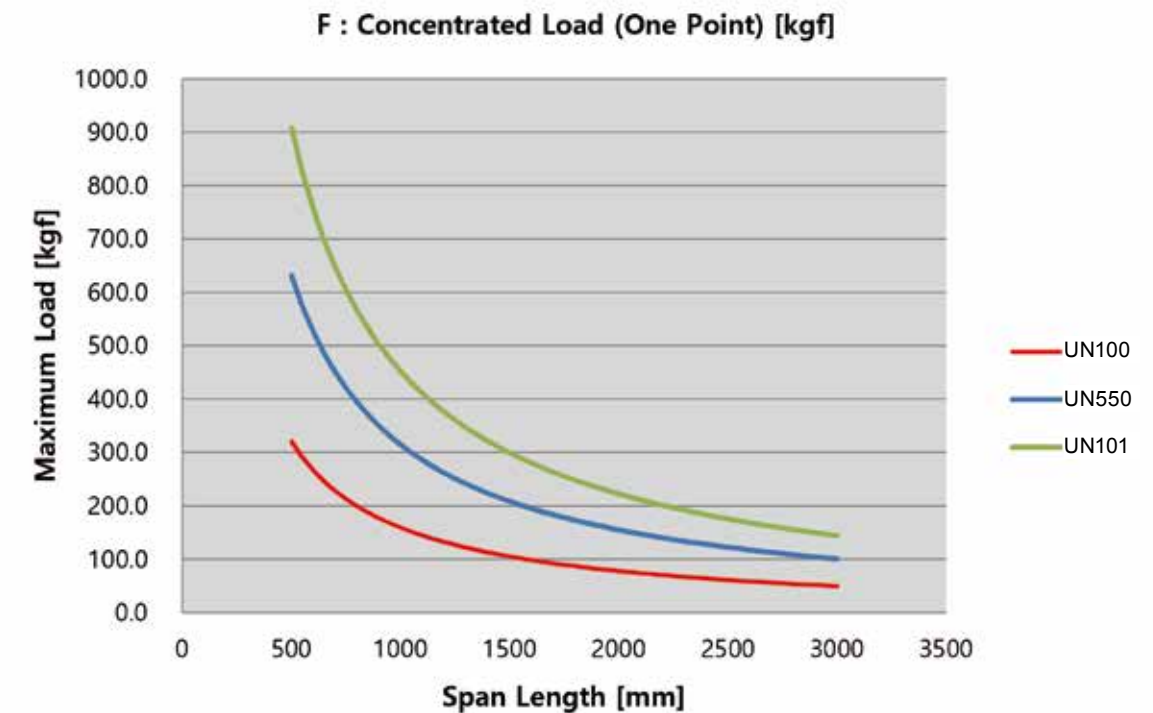
$$\delta_{sw+b} = \delta_{sw} + \delta_b = 2.38$$

Technical Data

◆ Maximum Load & Displacement Table

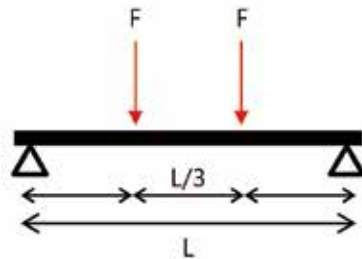
F : Concentrated Load (One Point) [kgf]						
L Span length [mm]	YN100		YN550		YN101	
	Maximum Load [kgf]	Displacement [mm]	Maximum Load [kgf]	Displacement [mm]	Maximum Load [kgf]	Displacement [mm]
500	319.6	0.6	631.3	0.4	907.3	0.3
550	290.4	0.7	573.8	0.5	824.6	0.4
600	266.1	0.9	525.8	0.6	755.6	0.5
650	245.5	1.0	485.2	0.7	697.3	0.6
700	227.9	1.2	450.3	0.8	647.2	0.7
750	212.5	1.3	420.2	0.9	603.8	0.8
800	199.1	1.5	393.7	1.0	565.8	0.9
850	187.3	1.7	370.4	1.2	532.3	1.0
900	176.8	1.9	349.7	1.3	502.5	1.1
950	167.3	2.1	331.1	1.5	475.8	1.3
1000	158.8	2.4	314.4	1.6	451.8	1.4
1050	151.2	2.6	299.2	1.8	430.0	1.5
1100	144.2	2.9	285.5	2.0	410.2	1.7
1150	137.8	3.1	272.9	2.2	392.1	1.8
1200	131.9	3.4	261.4	2.4	375.5	2.0
1250	126.5	3.7	250.7	2.6	360.3	2.2
1300	121.5	4.0	240.9	2.8	346.1	2.3
1350	116.9	4.3	231.8	3.0	333.1	2.5
1400	112.6	4.7	223.4	3.2	320.9	2.7
1450	108.6	5.0	215.5	3.4	309.6	2.9
1500	104.8	5.4	208.2	3.7	299.0	3.1
1550	101.3	5.7	201.3	3.9	289.1	3.3
1600	98.0	6.1	194.8	4.2	279.9	3.6
1650	94.9	6.5	188.8	4.5	271.1	3.8
1700	92.0	6.9	183.0	4.7	262.9	4.0
1750	89.3	7.3	177.6	5.0	255.1	4.3
1800	86.7	7.7	172.5	5.3	247.8	4.5
1850	84.2	8.2	167.7	5.6	240.8	4.8
1900	81.8	8.6	163.1	5.9	234.3	5.0
1950	79.6	9.1	158.8	6.2	228.0	5.3
2000	77.5	9.6	154.6	6.6	222.0	5.6
2050	75.5	10.1	150.7	6.9	216.4	5.9
2100	73.6	10.6	146.9	7.3	211.0	6.1
2150	71.7	11.1	143.4	7.6	205.8	6.4
2200	70.0	11.6	139.9	8.0	200.9	6.7
2250	68.3	12.1	136.7	8.3	196.2	7.1
2300	66.7	12.7	133.5	8.7	191.7	7.4
2350	65.1	13.2	130.5	9.1	187.3	7.7
2400	63.7	13.8	127.6	9.5	183.2	8.0
2450	62.2	14.4	124.8	9.9	179.2	8.4
2500	60.9	15.0	122.2	10.3	175.3	8.7
2550	59.5	15.6	119.6	10.7	171.6	9.1
2600	58.3	16.3	117.1	11.2	168.1	9.4
2650	57.0	16.9	114.8	11.6	164.7	9.8
2700	55.9	17.5	112.5	12.0	161.4	10.2
2750	54.7	18.2	110.3	12.5	158.2	10.6
2800	53.6	18.9	108.1	13.0	155.1	11.0
2850	52.5	19.6	106.1	13.4	152.1	11.4
2900	51.5	20.3	104.1	13.9	149.3	11.8
2950	50.5	21.0	102.1	14.4	146.5	12.2
3000	49.5	21.7	100.3	14.9	143.8	12.6

◆ Maximum Load & Displacement Graph



Technical Data

▣ Distributed Load – Two Point



◆ Calculation

L	: Span Length [mm]	Ω	: Safety Factor(=1.67)
A	: Cross Section [mm ²]	M _{sw}	: Bending Moment (Self Weight) [kgf·mm]
I _{xx}	: Area Moment of Inertia [mm ⁴]	M _b	: Bending Moment (Load) [kgf·mm]
y	: Distance from Neutral Axis to Outer Section [mm]	σ _a	: Allowable Bending Stress [kgf/mm ²]
Z	: Section Modulus [mm ³]	σ _{sw+b}	: Total Bending Stress [kgf/mm ²]
P _{sw}	: Self Weight [kg/m]	δ _{sw}	: Displacement (Self Seight) [mm]
F _y	: Yield Strength (Steel) [kgf/mm ²]	δ _b	: Displacement (Load) [mm]
P _{steel}	: Density (Steel) (=7850kgf/m ³)	δ _{sw+b}	: Total Displacement [mm]
E	: Modulus of Elasticity (Steel) [kgf/mm ²]		

Example) Section Type = UN100

L = 1000 mm

F = 119.13 kgf

- Stress -

$$F_s = \frac{235 \text{ Mpa}}{9.81 \text{ m/s}^2} = 23.96 \text{ kgf/mm}^2$$

$$\sigma_s = \frac{F_s}{\Omega} = \frac{23.96 \text{ kgf/mm}^2}{1.67} = 14.34 \text{ kgf/mm}^2$$

$$Z = \frac{I_{xx}}{y} = \frac{67251.95 \text{ mm}^4}{24.10 \text{ mm}} = 2790.68 \text{ mm}^3$$

$$P_{sw} = \rho_{steel} \cdot A = 7850 \text{ kgf/m}^3 \cdot 325.31 \text{ mm}^2 \cdot \frac{1 \text{ m}}{1000 \text{ mm}} = 2.55 \text{ kg/m}$$

$$M_{sw} = \frac{P_{sw} \cdot L^2}{8} = \frac{2.55 \text{ kg/m} \cdot \left(\frac{1 \text{ m}}{1000 \text{ mm}}\right) \cdot (1000 \text{ mm})^2}{8} = 319.21 \text{ kgf} \cdot \text{mm}$$

$$M_b = \frac{F \cdot L}{3} = \frac{119.13 \text{ kgf} \cdot 1000 \text{ mm}}{3} = 39710.00 \text{ kgf} \cdot \text{mm}$$

$$\sigma_{sw+b} = \frac{M_{sw} + M_b}{Z} = \frac{319.21 \text{ kgf} \cdot \text{mm} + 39710.00 \text{ kgf} \cdot \text{mm}}{2790.68 \text{ mm}^3} = 14.34 \text{ kgf/mm}^2$$

$$\sigma_{sw+b} < \sigma_s \Rightarrow 14.343903 \text{ kgf/mm}^2 < 14.34400 \text{ kgf/mm}^2 \dots \text{O.K.}$$

- Displacement -

$$\delta_{sw} = \frac{5 \cdot P_{sw} \cdot L^4}{384 \cdot E \cdot I_{xx}} = \frac{5 \cdot 2.55 \text{ kg/m} \cdot \left(\frac{1 \text{ m}}{1000 \text{ mm}}\right)^4 \cdot 1000 \text{ mm}^4}{384 \cdot 20904.20 \text{ kgf/mm}^2 \cdot 67251.95 \text{ mm}^4} = 0.02 \text{ mm}$$

$$\delta_b = \frac{23 \cdot F \cdot L^3}{648 \cdot E \cdot I_{xx}} = \frac{23 \cdot 119.13 \text{ kgf} \cdot 1000 \text{ mm}^3}{648 \cdot 20904.20 \text{ kgf/mm}^2 \cdot 67251.95 \text{ mm}^4} = 3.01 \text{ mm}$$

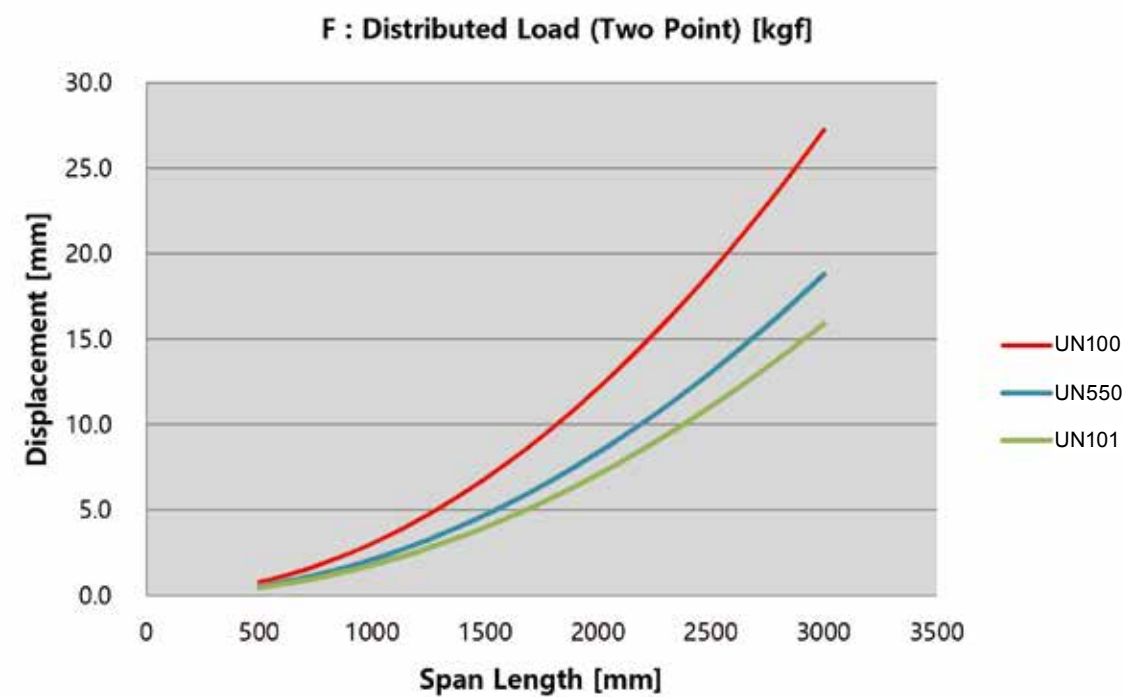
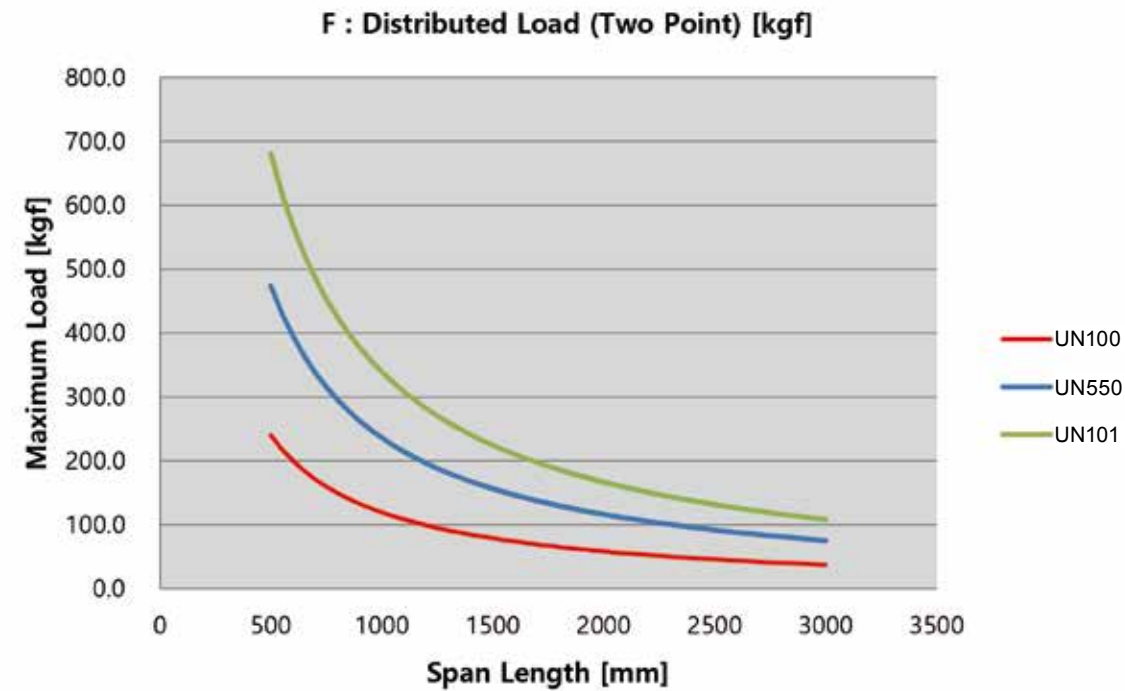
$$\delta_{sw+b} = \delta_{sw} + \delta_b = 3.03$$

◆ Maximum Load & Displacement Table

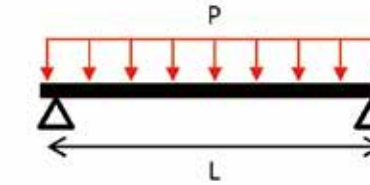
F : Concentrated Load (One Point) [kgf]						
L Span length [mm]	YN100		YN550		YN101	
	Maximum Load [kgf]	Displacement [mm]	Maximum Load [kgf]	Displacement [mm]	Maximum Load [kgf]	Displacement [mm]
500	239.7	0.8	473.5	0.5	680.5	0.4
550	217.8	0.9	430.3	0.6	618.5	0.5
600	199.6	1.1	394.3	0.8	566.7	0.6
650	184.1	1.3	363.9	0.9	523.0	0.7
700	170.9	1.5	337.8	1.0	485.4	0.9
750	159.4	1.7	315.1	1.2	452.9	1.0
800	149.3	1.9	295.3	1.3	424.4	1.1
850	140.5	2.2	277.8	1.5	399.2	1.3
900	132.6	2.5	262.3	1.7	376.9	1.4
950	125.5	2.7	248.3	1.9	356.8	1.6
1000	119.1	3.0	235.8	2.1	338.8	1.8
1050	113.4	3.3	224.4	2.3	322.5	2.0
1100	108.1	3.7	214.1	2.5	307.6	2.1
1150	103.3	4.0	204.7	2.8	294.1	2.3
1200	98.9	4.4	196.0	3.0	281.6	2.5
1250	94.9	4.7	188.1	3.3	270.2	2.8
1300	91.1	5.1	180.7	3.5	259.6	3.0
1350	87.7	5.5	173.9	3.8	249.8	3.2
1400	84.4	5.9	167.5	4.1	240.7	3.5
1450	81.4	6.4	161.6	4.4	232.2	3.7
1500	78.6	6.8	156.1	4.7	224.3	4.0
1550	76.0	7.3	151.0	5.0	216.9	4.2
1600	73.5	7.8	146.1	5.3	209.9	4.5
1650	71.2	8.3	141.6	5.7	203.3	4.8
1700	69.0	8.8	137.3	6.0	197.2	5.1
1750	66.9	9.3	133.2	6.4	191.4	5.4
1800	65.0	9.8	129.4	6.8	185.8	5.7
1850	63.1	10.4	125.8	7.1	180.6	6.1
1900	61.4	10.9	122.3	7.5	175.7	6.4
1950	59.7	11.5	119.1	7.9	171.0	6.7
2000	58.1	12.1	116.0	8.4	166.5	7.1
2050	56.6	12.7	113.0	8.8	162.3	7.4
2100	55.2	13.4	110.2	9.2	158.2	7.8
2150	53.8	14.0	107.5	9.7	154.4	8.2
2200	52.5	14.7	104.9	10.1	150.7	8.6
2250	51.2	15.3	102.5	10.6	147.1	9.0
2300	50.0	16.0	100.1	11.0	143.7	9.4
2350	48.9	16.7	97.9	11.5	140.5	9.8
2400	47.7	17.4	95.7	12.0	137.4	10.2
2450	46.7	18.2	93.6	12.5	134.4	10.6
2500	45.6	18.9	91.6	13.0	131.5	11.0
2550	44.7	19.7	89.7	13.6	128.7	11.5
2600	43.7	20.5	87.9	14.1	126.1	11.9
2650	42.8	21.3	86.1	14.7	123.5	12.4
2700	41.9	22.1	84.4	15.2	121.0	12.9
2750	41.0	22.9	82.7	15.8	118.6	13.4
2800	40.2	23.7	81.1	16.4	116.3	13.9
2850	39.4	24.6	79.5	17.0	114.1	14.4
2900	38.6	25.5	78.0	17.6	111.9	14.9
2950	37.9	26.3	76.6	18.2	109.9	15.4
3000	37.2	27.2	75.2	18.8	107.8	15.9

Technical Data

◆ Maximum Load & Displacement Graph



■ Uniform Load



◆ Calculation

L	: Span Length [mm]	Ω	: Safety Factor (=1.67)
A	: Cross Section [mm ²]	M _{sw}	: Bending Moment (Self Weight) [kgf·mm]
I _{xx}	: Area Moment of Inertia [mm ⁴]	M _b	: Bending Moment (Load) [kgf·mm]
y	: Distance from Neutral Axis to Outer Section [mm]	σ _a	: Allowable Bending Stress [kgf/mm ²]
Z	: Section Modulus [mm ³]	σ _{sw+b}	: Total Bending Stress [kgf/mm ²]
P _{sw}	: Self Weight [kg/m]	δ _{sw}	: Displacement (Self Weight) [mm]
F _y	: Yield Strength (Steel) [kgf/mm ²]	δ _b	: Displacement (Load) [mm]
ρ _{steel}	: Density (Steel) (=7850kgf/m ³)	δ _{sw+b}	: Total Displacement [mm]
E	: Modulus of Elasticity (Steel) [kgf/mm ²]		

Example) Section Type = UN100
L = 1000 mm
F = 317.69 kgf/m

- Stress -

$$F_y = \frac{235 \text{ Mpa}}{9.81 \text{ m/s}^2} = 23.96 \text{ kgf/mm}^2$$

$$\sigma_a = \frac{F_y}{\Omega} = \frac{23.96 \text{ kgf/mm}^2}{1.67} = 14.34 \text{ kgf/mm}^2$$

$$Z = \frac{I_{xx}}{y} = \frac{67251.95 \text{ mm}^4}{24.10 \text{ mm}} = 2790.68 \text{ mm}^3$$

$$P_{sw} = \rho_{steel} \cdot A = 7850 \text{ kgf/m}^3 \cdot 325.31 \text{ mm}^2 \cdot \frac{1 \text{ m}^2}{(1000 \text{ mm})^2} = 2.55 \text{ kg/m}$$

$$M_{sw} = \frac{P_{sw} \cdot L^2}{8} = \frac{2.55 \text{ kgf/m} \cdot \left(\frac{1 \text{ m}}{1000 \text{ mm}}\right) \cdot (1000 \text{ mm})^2}{8} = 319.21 \text{ kgf} \cdot \text{mm}$$

$$M_b = \frac{P \cdot L^2}{8} = \frac{317.69 \text{ kgf/m} \cdot \left(\frac{1 \text{ m}}{1000 \text{ mm}}\right) \cdot (1000 \text{ mm})^2}{8} = 39711.25 \text{ kgf} \cdot \text{mm}$$

$$\sigma_{sw+b} = \frac{M_{sw} + M_b}{Z} = \frac{319.21 \text{ kgf} \cdot \text{mm} + 39711.25 \text{ kgf} \cdot \text{mm}}{2790.68 \text{ mm}^3} = 14.34 \text{ kgf/mm}^2$$

$$\sigma_{sw+b} < \sigma_a \Rightarrow 14.344351 \text{ kgf/mm}^2 < 14.344400 \text{ kgf/mm}^2 \dots \dots \text{O.K.}$$

- Displacement -

$$\delta_{sw} = \frac{5 \cdot P_{sw} \cdot L^4}{384 \cdot E \cdot I_{xx}} = \frac{5 \cdot 2.55 \text{ kgf/m} \cdot \left(\frac{1 \text{ m}}{1000 \text{ mm}}\right) \cdot 1000 \text{ mm}^4}{384 \cdot 20904.20 \text{ kgf/mm}^2 \cdot 67251.95 \text{ mm}^4} = 0.02 \text{ mm}$$

$$\delta_b = \frac{5 \cdot P \cdot L^4}{384 \cdot E \cdot I_{xx}} = \frac{5 \cdot 317.69 \text{ kgf/m} \cdot \left(\frac{1 \text{ m}}{1000 \text{ mm}}\right) \cdot 1000 \text{ mm}^4}{384 \cdot 20904.20 \text{ kgf/mm}^2 \cdot 67251.95 \text{ mm}^4} = 2.94 \text{ mm}$$

$$\delta_{sw+b} = \delta_{sw} + \delta_b = 2.97$$

Technical Data

◆ Maximum Load & Displacement Table

F : Concentrated Load (One Point) [kgf]						
L Span length [mm]	YN100		YN550		YN101	
	Maximum Load [kgf]	Displacement [mm]	Maximum Load [kgf]	Displacement [mm]	Maximum Load [kgf]	Displacement [mm]
500	1278.4	0.7	2525.2	0.5	3629.4	0.4
550	1056.1	0.9	2086.4	0.6	2998.6	0.5
600	887.0	1.1	1752.6	0.7	2518.8	0.6
650	755.4	1.3	1492.8	0.9	2145.5	0.7
700	651.0	1.5	1286.7	1.0	1849.2	0.8
750	566.8	1.7	1120.4	1.1	1610.2	1.0
800	497.8	1.9	984.3	1.3	1414.6	1.1
850	440.7	2.1	871.6	1.5	1252.5	1.3
900	392.8	2.4	777.0	1.7	1116.6	1.4
950	352.3	2.7	697.0	1.8	1001.7	1.6
1000	317.7	3.0	628.8	2.0	903.5	1.7
1050	287.9	3.3	570.0	2.3	819.0	1.9
1100	262.1	3.6	519.0	2.5	745.8	2.1
1150	239.6	3.9	474.6	2.7	681.9	2.3
1200	219.8	4.3	435.6	2.9	625.9	2.5
1250	202.4	4.6	401.2	3.2	576.4	2.7
1300	186.9	5.0	370.7	3.5	532.5	2.9
1350	173.2	5.4	343.5	3.7	493.4	3.2
1400	160.8	5.8	319.1	4.0	458.5	3.4
1450	149.8	6.2	297.3	4.3	427.1	3.6
1500	139.8	6.7	277.6	4.6	398.7	3.9
1550	130.7	7.1	259.7	4.9	373.1	4.2
1600	122.5	7.6	243.5	5.2	349.8	4.4
1650	115.1	8.1	228.8	5.6	328.6	4.7
1700	108.3	8.6	215.3	5.9	309.3	5.0
1750	102.0	9.1	203.0	6.3	291.6	5.3
1800	96.3	9.6	191.7	6.6	275.3	5.6
1850	91.0	10.2	181.3	7.0	260.4	5.9
1900	86.2	10.7	171.7	7.4	246.6	6.2
1950	81.7	11.3	162.8	7.8	233.8	6.6
2000	77.5	11.9	154.6	8.2	222.0	6.9
2050	73.6	12.5	147.0	8.6	211.1	7.3
2100	70.1	13.1	139.9	9.0	200.9	7.6
2150	66.7	13.7	133.4	9.4	191.5	8.0
2200	63.6	14.4	127.2	9.9	182.6	8.4
2250	60.7	15.0	121.5	10.3	174.4	8.8
2300	58.0	15.7	116.1	10.8	166.7	9.2
2350	55.4	16.4	111.1	11.3	159.4	9.6
2400	53.0	17.1	106.4	11.8	152.6	10.0
2450	50.8	17.8	101.9	12.3	146.3	10.4
2500	48.7	18.5	97.7	12.8	140.3	10.8
2550	46.7	19.3	93.8	13.3	134.6	11.3
2600	44.8	20.1	90.1	13.8	129.3	11.7
2650	43.0	20.8	86.6	14.4	124.3	12.2
2700	41.4	21.6	83.3	14.9	119.5	12.6
2750	39.8	22.4	80.2	15.5	115.0	13.1
2800	38.3	23.3	77.2	16.0	110.8	13.6
2850	36.9	24.1	74.4	16.6	106.8	14.1
2900	35.5	24.9	71.8	17.2	102.9	14.6
2950	34.2	25.8	69.2	17.8	99.3	15.1
3000	33.0	26.7	66.8	18.4	95.9	15.6

◆ Maximum Load & Displacement Graph

