Highlights of DANA Insulated Sandwich Panels

DANA Sandwich Panels are manufactured in automatic sandwich panel press with Polyurethane foam injection .Combination of wide variety of facing materials, surface patterns and insulations offer the customers a wide choice of panels to choose from.

Surface Finish Types	Top & Bottom Sheet Material Types	Insulation Types
Plain	Pre Painted Aluminum	Polyurethane (PUR)
Corrugated	Mill Finish Aluminum	Polyisocyanurate (PIR)
	Pre Painted Galvanized Steel	Mineral Wool / Rockwool
	Mill Finish Galvanized Steel	Expanded Polystyrene (EPS)
	Pre Painted AluZinc	
	Mill Finish AluZinc	

Specification of Top & Bottom Profile Sheet Material	
Aluminum	Grade A3105 H 16 in mill finish or prepainted
Galvanized Iron sheets (GI)	ASTM A653 or other equivalent standards like JIS 3302 , EN 10326 /10327 , IS 277 with Zinc Coating G60 -180gms/m2 or G90 - 275 gms/m2
Galvanized Iron sheets (GI)	ASTM A792 with Coating AZ60-AZ180

Combinations of Top Skin and Liner	
Top Skin	Liner
GI Mill Finish	GI Mill Finish
GI Polyester Coated	GI Polyester Coated
GI PVDF Coated	GI PVDF Coated
Aluminum Mill Finish	Aluminum Mill Finish
Aluminum Polyester Coated	Aluminum Polyester Coated
Aluminum PVDF Coated	Aluminum PVDF Coated
Alu-Zinc alloy coated steel mill finish	Alu-Zinc alloy coated steel mill finish
Alu Zinc alloy coated steel PVDF coated	Alu Zinc alloy coated steel PVDF coated
	Aluminum Foil 0.05mm thick

Insulation Specifications

Thermal Conductivity Value

Amount of heat (W) passing through a material having surface of 1 M2 and thickness 1 M in order to rise temperature by 1oC . Units are W/m K

K value (Insulation Value)

Thermal conductivity divided by thickness of the material [W / m2 K]

U value (Total Insulation Value)

Also known as Overall Heat Transfer Coefficient. It is determined by the insulation value of the various materials forming the panel . [W / m2 K] , KCal/m2 h oC , BTU/ F t2 h oF

On Continuous System	Density	K value
Polyurethane (PUR)	35-40 Kg/m3	0.022 w/m^{2}K
Polyisocyanurate (PIR)	40-45 kg/m3	0.022 w/m^{2}K
Mineral Wool / Rockwool	80-150 kg/m3	0.04 w/m^{2}K
Expanded Polystyrene (EPS)	16-24 kg/m3	0.035 w/m^{2}K

Please Note Lower the K value , better is insulation capability

1. Polyurethane Properties

A Mechanical Characteristic of Foam

Density	35-40Kg/m3 (as per BSEN 1602: 1997)
Tensile Stress	150 kpa (as per BSEN 1608: 1997)
Compression Resistance	100 kpa (as per ASTM C165 : 2000)
Shear Resistance	150 kpa (as per ASTM 271/ 271M)
Fire Property	B2/ B3 as per DIN 4102-1

B Insulation Capacity

K Value - Thermal Conductivity	0.022 W/ mK
Tolerance	+ /- 0.002

C Water Absorption of the foam after 24 hours: 1.0 % of Volume

D Closed Cell content > 94%

E Overall Heat Transfer Coefficient (U) varies with the thickness of the panel

Polyurethane Panel U Value Chart				
Core Thickness in mm				
Overall Heat Transfer Coefficient " U " Value	40	50	75	100
W / M2 oC	0.525	0.420	0.290	0.210
KCAL / M2 h oC	0.451	0.361	0.247	0.181
BTU / F t2 h oF	0.092	0.074	0.050	0.037

2. Poly isocyanurate (PIR) Foam Properties

A Mechanical Properties

Density	40-45 Kg/m3 (as per BSEN 1602: 1997)
Tensile Stress	Greater than100 kpa (as per BSEN 1608: 1997)
Compression Resistance	Greater than 100 kpa (as per ASTM C165 : 2000)
Shear Resistance	>100 kpa (as per ASTM 271/ 271M)
Fire Property	B2/ B1 as per DIN 4102 - 1

B Overall Heat Transfer Coefficient " U ' Value - W/m2 K

Thickness In mm	35	40	50	60	75	100
Overall Heat Transfer Coefficient " U "	0.67	0.60	0.47	0.40	0.31	0.24

3. Mineral Wool Features - For Fire Rated Panels

A Mechanical Properties

Density	80-120 Kg/m3
Tensile Stress	0.040 W/mK (Average)
Compression Resistance	> 70 Kpa (as per ASTM C165 : 2000)
Fire Property	> 750 oC melting point Al as per DIN 4102-1

B Insulation Capacity

Thickness of mineral Wool (mm)	50	80	100
U Value (W / m2 K)	0.76	0.47	0.37

K value - 0.040 W /mK

Please Note Overall Heat Transfer Coefficient " U " varies with thickness of the panel

C Fire Properties

Fire Resistance	> 750 o C melting point Al as per DIN 4102
Calorific Value	<1.8 Mj/ Kg according to EN 13501
Combustibility	A1 as per EN 13501 Non combustible as per BS 476 : Part 4
Flame Spread Index	0
Smoke Development Index	0

D Water Absorption of the foam after 24 hours

DIN 4102-1 fire test		
Building Material Class		Designation
Class A	A1 (Mineral Wool Fire Rated Panels)	Non-combustible materials
	A2	
Class B	B1	Not easily flammable
	B2 (PU Panel)	Flammable
	B3 (PU Panel)	Easily flammable

Surface Coating Specifications

Various options are available for surface coating of panels .Standard surface coating specifications are :-

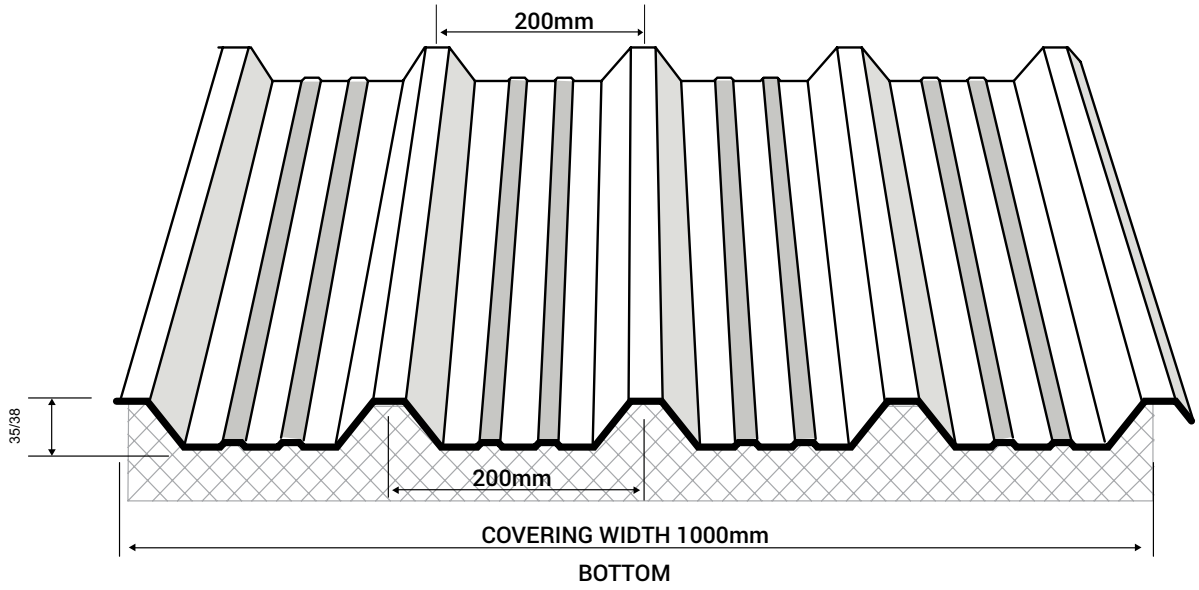
Metallic Top Skin and the liner material (other than Aluminium Coil) can be supplied with surface coating as follows :-

Surface is painted with baked regular modified enamel polyester(RMP), with 5 micron primer and 20 micron coat on the weathering side and 5/7 micron primer on the reverse.

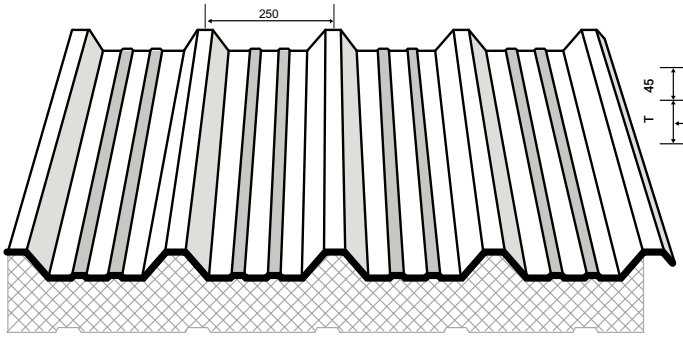
Please Note PVDF , Silicon , Modified Polyester ,Plastisol , ARS shall be applied on request

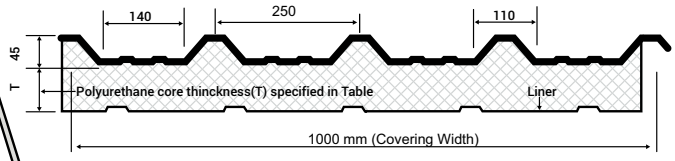
Types of DANA Insulated Sandwich Panels

DCP 35 / 200



DCP 45 / 250





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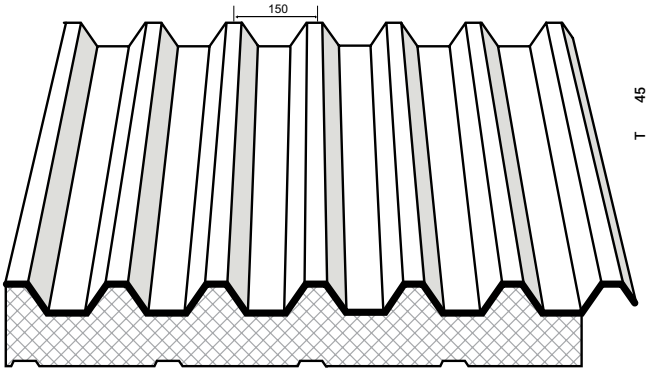
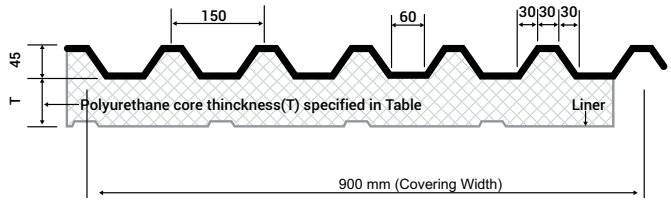
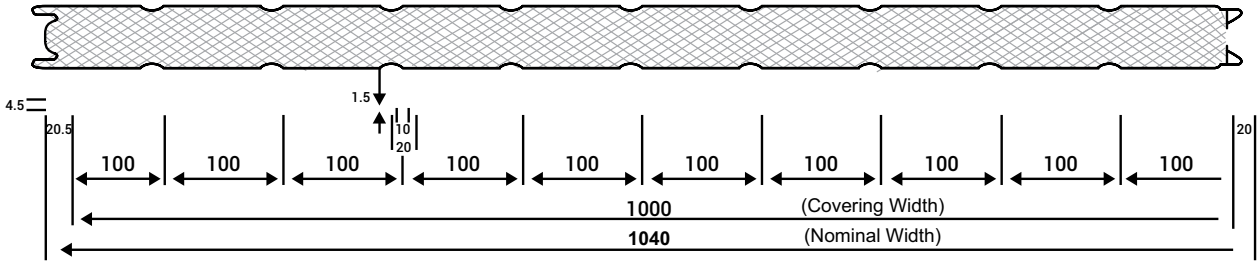
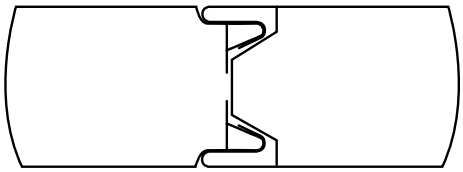




Dana Flat Panel

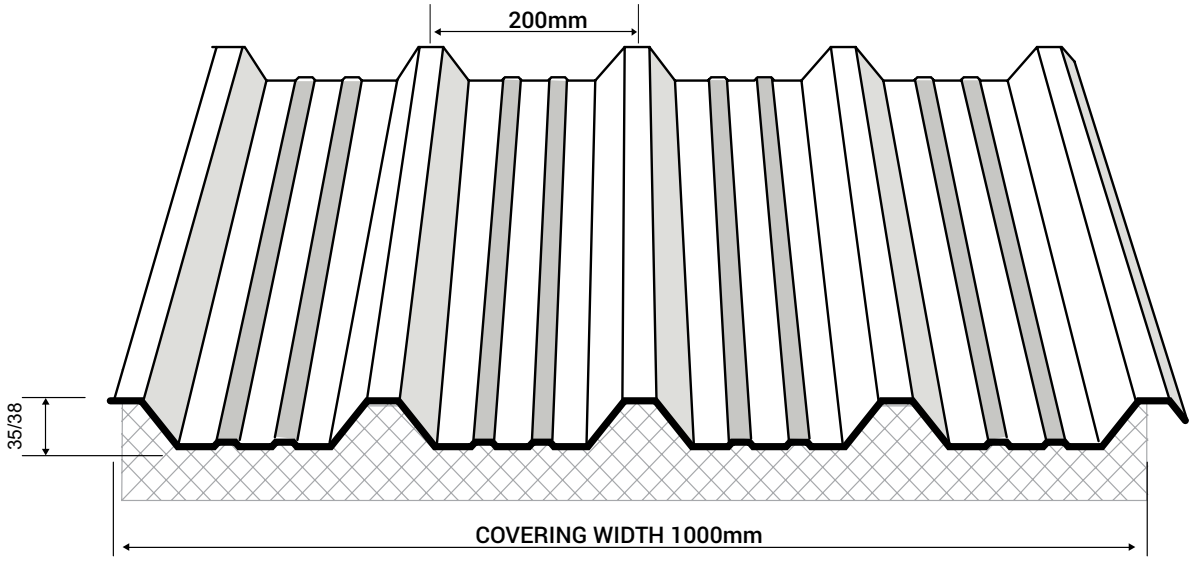




Tounge and Groove Joint

SANDWCH PANELS

DCP 35(38)/200
Sandwich Panel



Roof and Wall Panel

Specification Details

Top Skin Sheet / Liner Sheet			Insulation	Surface Coating	
Aluminium	**GI**	**Alu Zinc**		**Top**	**Liner**
0.5mm - 0.9mm thickness , A3105 H16 for mill finish , H46 for prepainted	ASTM A653 or other equivalent standards like JIS 3302 , EN 10326 /10327, IS 277either Zinc Coating G60 -180gms/m² or G90 - 275 gms/ m²	ASTM A792 with Coating AZ60 - AZ180	Polyurethane Injected Foam (PUR) PIR , Mineral Wool , EPS on request	Top Coat of RMP (Regular Modified Polyester) of 20 microns over 5 micron of nominal epoxy primer which acts as Corrosion inhibitor PVDF Silicon, Modified Polyester, Plastisol, ARS shall be applied on request.	Backing coat with matching color to top coat of 5-7 microns with epoxy primer of 5 micron PVDF Silicon, Modified Polyester, Plastisol, ARS shall be applied on request.

Polyurethane Panel U Value Chart

Core Thickness in mm				
Overall Heat Transfer Coefficient " U " Value	40	50	75	100
W / M2 K	0.525	0.420	0.290	0.210
KCAL / M2 h K	0.451	0.361	0.247	0.181
BTU / F t2 h oF	0.092	0.074	0.050	0.037

Section Properties and Load Chart

A Aluminium Skin Sheet - 0.7 mm external, 0.5 mm internal

Section Properties (For 1 meter of coverage width)

Panel Core Thickness (in mm)	Area 1 x cm 4	Top in Compression		Bottom in Compression	
		Z Top cm^3	Moment Top Kn	Z Bottom cm^3	Moment Bottom Kn
50	38	11	4.31	22	2.58
75	99	23	2.66	31	3.53
100	198	38	4.37	42	4.79

Load Chart (KN / M2)

Panel Core Thickness (in mm)	Number of Spans Nos	Span in meters								
		1	1.5	2	2.5	3	3.5	4	4.5	5
50	Single	10.48	4.66	2.63	1.69	1.17	0.86	0.66	0.53	0.43
	Multi	14.48	4.29	1.82	0.94	0.55	0.35	0.24	0.17	0.13
75	Single	21.29	9.47	5.33	3.41	2.37	1.75	1.34	1.06	0.86
	Multi	37.87	11.23	4.74	2.43	1.41	0.87	0.60	0.43	0.31
100	Single	34.93	15.53	8.74	5.60	3.89	2.85	2.19	1.73	1.41
	Multi	76.07	22.25	9.52	4.88	2.83	1.78	1.78	0.84	0.62

B GI Skin Sheet - 0.5 mm external , 0.5 mm internal

Section Properties (For 1 meter of coverage width)

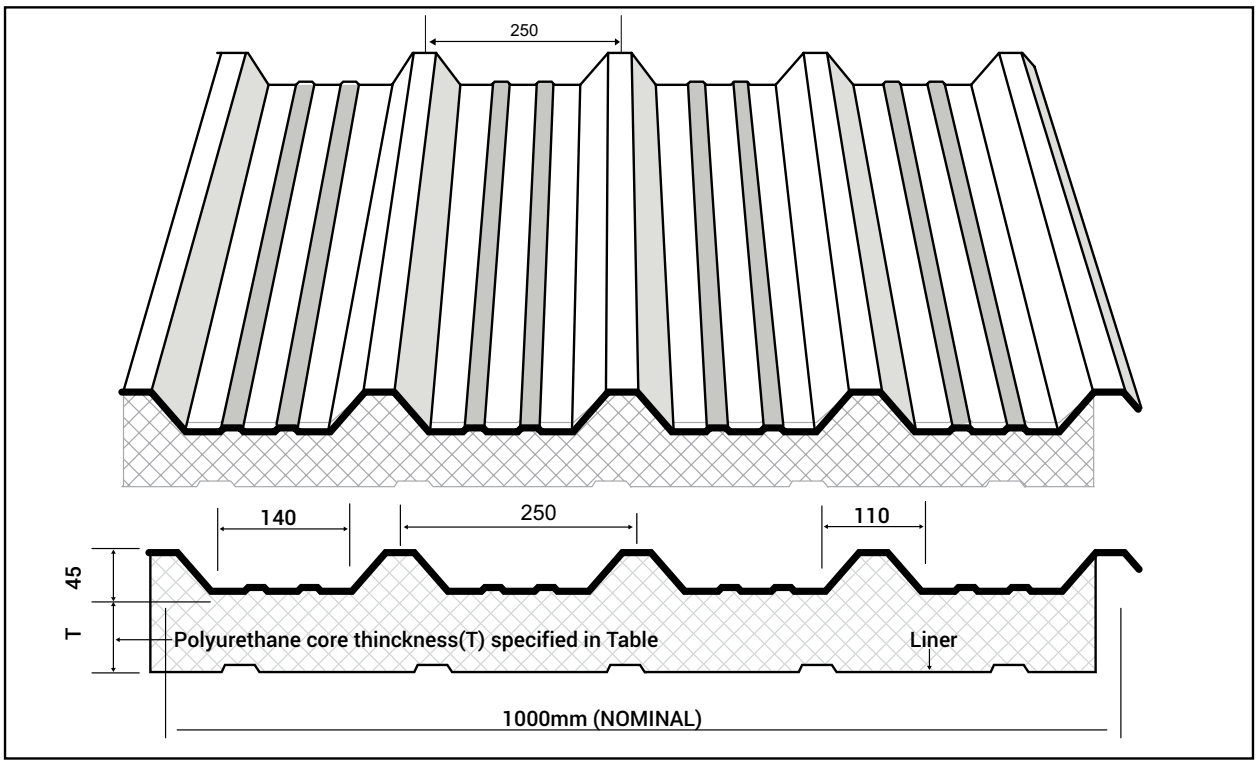
Panel Core Thickness (in mm)	Area 1 x cm 4	Top in Compression		Bottom in Compression	
		Z Top cm^3	Moment Top Kn	Z Bottom cm^3	Moment Bottom Kn
50	31	9	1.46	21	3.53
75	84	18	3.01	30	5.05
100	170	29	4.91	41	6.96

Load Chart (KN / M2)

Panel Core Thickness (in mm)	Number of Spans Nos	Span in meters								
		1	1.5	2	2.5	3	3.5	4	4.5	5
50	Single	11.71	5.21	2.93	1.88	1.31	0.96	0.74	0.59	0.48
	Multi	34.28	10.17	4.29	2.20	1.28	0.81	0.55	0.39	0.28
75	Single	24.11	10.72	6.04	3.87	2.69	1.98	1.52	1.20	0.97
	Multi	92.86	27.82	11.74	6.02	3.49	2.20	1.48	1.04	0.76
100	Single	39.33	17.48	9.84	6.30	4.38	3.22	2.47	1.95	1.58
	Multi	191.02	56.60	23.89	12.23	7.08	4.46	2.99	2.11	1.54

SANDWCH PANELS

DCP 45/250
Sandwich Panel



Roof and Wall Panel

Specification Details

Top Skin Sheet / Liner Sheet			Insulation	Surface Coating	
Aluminium	**GI**	**Alu Zinc**		**Top**	**Liner**
0.5mm - 0.9mm thickness , A3105 H16 for mill finish , H46 for prepainted	ASTM A653 or other equivalent standards like JIS 3302 , EN 10326 /10327, IS 277either Zinc Coating G60 -180gms/m² or G90 - 275 gms/ m²	ASTM A792 with Coating AZ60 - AZ180	Polyurethane Injected Foam (PUR) PIR , Mineral Wool , EPS on request	Top Coat of RMP (Regular Modified Polyester) of 20 microns over 5 micron of nominal epoxy primer which acts as Corrosion inhibitor PVDF Silicon, Modified Polyester, Plastisol, ARS shall be applied on request.	Backing coat with matching color to top coat of 5-7 microns with epoxy primer of 5 micron PVDF Silicon, Modified Polyester, Plastisol, ARS shall be applied on request.

Polyurethane Panel U Value Chart

Core Thickness in mm				
Overall Heat Transfer Coefficient " U " Value	40	50	75	100
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BTU / F t2 h oF	0.092	0.074	0.050	0.037

Section Properties and Load Chart

A Aluminium Skin Sheet - 0.7 mm external, 0.5 mm internal

Section Properties (For 1 meter of coverage width)

Panel Core Thickness (in mm)	Area 1 x cm 4	Top in Compression		Bottom in Compression	
		Z Top cm^3	Moment Top Kn	Z Bottom cm^3	Moment Bottom Kn
50	35	9	1.08	28	3.28
75	85	18	2.09	30	3.52
100	174	31	3.56	40	4.62

Load Chart (KN / M2)

Panel Core Thickness (in mm)	Number of Spans Nos	Span in meters								
		1	1.5	2	2.5	3	3.5	4	4.5	5
50	Single	8.64	3.85	2.17	1.39	0.97	0.71	0.55	0.44	0.36
	Multi	13.53	4.01	1.70	0.87	0.51	0.33	0.22	0.16	0.12
75	Single	16.72	7.43	4.19	2.68	1.87	1.36	1.05	0.83	0.68
	Multi	32.72	9.70	4.10	2.10	1.22	0.77	0.52	0.37	0.27
100	Single	28.46	12.66	7.12	4.56	3.17	2.33	1.79	1.42	1.15
	Multi	66.87	19.82	8.37	4.29	2.49	1.57	1.05	0.74	0.54

B GI Skin Sheet - 0.5 mm external , 0.5 mm internal

Section Properties (For 1 meter of coverage width)

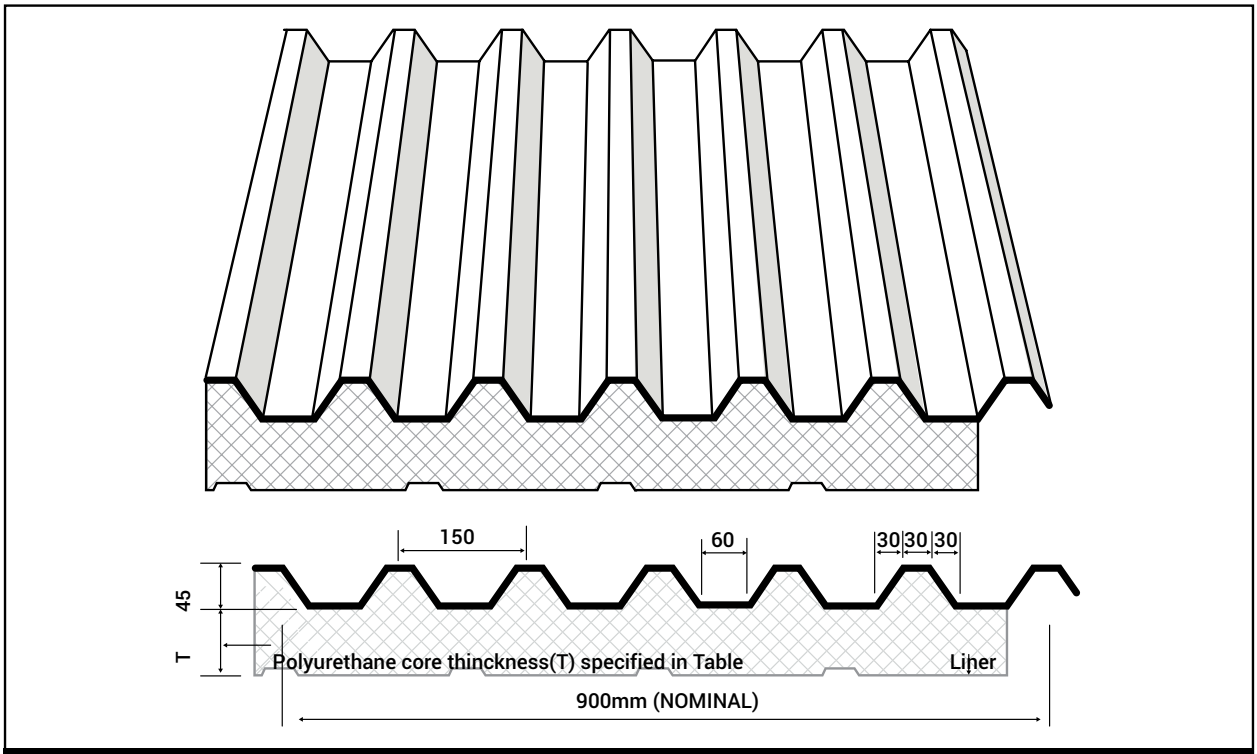
Panel Core Thickness (in mm)	Area 1 x cm 4	Top in Compression		Bottom in Compression	
		Z Top cm^3	Moment Top Kn	Z Bottom cm^3	Moment Bottom Kn
50	27	7	1.17	25	4.26
75	71	14	2.37	29	4.93
100	148	24	4.05	39	6.63

Load Chart (KN / M2)

Panel Core Thickness (in mm)	Number of Spans Nos	Span in meters								
		1	1.5	2	2.5	3	3.5	4	4.5	5
50	Single	9.40	4.18	2.36	1.51	1.05	0.78	0.60	0.47	0.39
	Multi	30.49	9.04	3.82	1.96	1.14	0.72	0.49	0.34	0.25
75	Single	18.95	8.43	4.75	3.04	2.11	1.56	1.19	0.95	0.77
	Multi	79.52	23.57	9.95	5.10	2.95	1.86	1.25	0.88	0.65
100	Single	32.38	14.40	8.10	5.19	3.61	2.65	2.03	1.61	1.30
	Multi	166.61	49.37	20.83	10.67	6.18	3.90	2.61	1.84	1.34

SANDWCH PANELS

DCP 45/150
Sandwich Panel



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BTU / F t2 h oF	0.092	0.074	0.050	0.037

Section Properties and Load Chart

A Aluminium Skin Sheet - 0.7 mm external, 0.5 mm internal

Section Properties (For 1 meter of coverage width)

Panel Core Thickness (in mm)	Area 1 x cm 4	Top in Compression		Bottom in Compression	
		Z Top cm^3	Moment Top Kn	Z Bottom cm^3	Moment Bottom Kn
50	48	14	1.66	29	3.38
75	109	26	2.96	34	3.87
100	210	41	4.71	43	4.99

Load Chart (KN / M2)

Panel Core Thickness (in mm)	Number of Spans Nos	Span in meters								
		1	1.5	2	2.5	3	3.5	4	4.5	5
50	Single	13.28	5.91	3.33	2.13	1.48	1.09	0.84	0.67	0.54
	Multi	18.54	5.50	2.33	1.20	0.70	0.44	0.30	0.21	0.16
75	Single	23.71	10.54	5.94	3.80	2.64	1.94	1.49	1.18	0.96
	Multi	41.89	12.42	5.25	2.69	1.56	0.99	0.66	0.47	0.35
100	Single	37.73	16.71	9.44	6.04	4.20	3.09	2.37	1.87	1.52
	Multi	80.68	23.91	10.09	5.17	3.07	2.37	1.27	0.93	0.66

B GI Skin Sheet - 0.5 mm external , 0.5 mm internal

Section Properties (For 1 meter of coverage width)

Panel Core Thickness (in mm)	Area 1 x cm 4	Top in Compression		Bottom in Compression	
		Z Top cm^3	Moment Top Kn	Z Bottom cm^3	Moment Bottom Kn
50	37	10	1.76	26	4.25
75	90	19	3.26	32	5.40
100	178	31	5.23	42	7.13

Load Chart (KN / M2)

Panel Core Thickness (in mm)	Number of Spans Nos	Span in meters								
		1	1.5	2	2.5	3	3.5	4	4.5	5
50	Single	14.11	6.28	3.54	2.27	1.58	1.16	0.89	0.71	0.57
	Multi	41.87	12.41	5.24	2.69	1.56	0.99	0.66	0.47	0.34
75	Single	26.10	11.61	6.53	4.18	2.91	2.14	1.64	1.30	1.05
	Multi	109.10	29.96	12.65	6.48	3.75	2.37	1.59	1.12	0.82
100	Single	44.82	18.59	40.46	6.70	4.66	3.42	2.62	2.07	1.68
	Multi	199.87	59.23	24.99	12.80	7.41	4.67	3.13	2.2	1.61