

GRP TECHNICAL GUIDE

CHARACTERISTICS OF MITA GRP PRODUCTS

Mechanical Specifications:

Isophthalic thermoset polyester resin with uni-directional 'E' glass core, sandwiched between inner and outer layers of 450 gms/sq m 'E' glass continuous filament material.

All surfaces covered with polyester veil to provide chemical and UV protection.

Flame-Retardant GRP:

Non-halogenated resin or included flame-retardant additives provides conformity to flame spread test according to BS 476: Part 7; 1987; Class 1 (One).

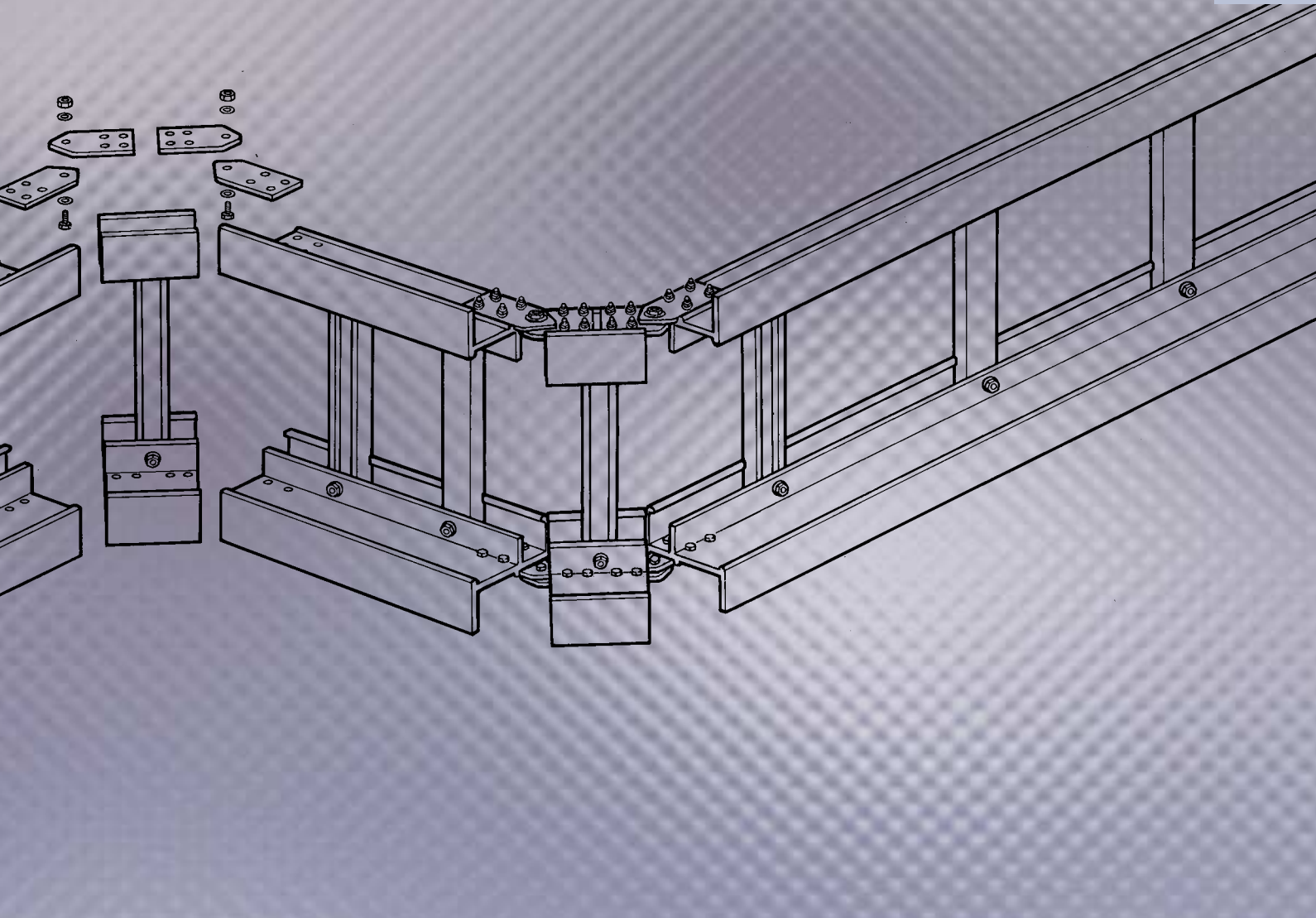
Class 1 GRP does not contain any Chlorine or Bromine. No toxic halogens are released at high temperatures nor in case of a fire.

Flame retardant, halogen free.

Ideal for use in the food and petro-chem industry. Easy to handle / cut / drill on site.

Resistance to Various Chemical Agents

Chemical agent	Concentration	Temp °C	Resistance
Acetic Acid	5%	65	+
Aluminium Sulphate		95	+
Ammonium Nitrate	100%	95	+
Beer		20	+
Benzene		20	+
Calcium Chloride		95	+
Chlorine Gas/Water		20	+
Chromic Acid	5%	95	+
Copper Sulphate		95	+
Ethylene Chlorohydrin		65	+
Ethylene Glycol		95	+
Ferrous Sulphate		95	+
Fatty Acids	100%	95	+
Hydrochloric Acid	1%	95	+
Hydrochloric Acid	10%	65	+
Hydrochloric Acid	37%	25	+
Kerosene		95	+
Magnesium Chloride		95	+
Naphthalene		95	+
Nitric Acid	30%	20	+
Phosphoric Acid	10%	95	+
Phosphoric Acid	10%	95	+
Phosphoric Acid	85%	65	+
Salt Water		65	+
Sodium Bicarbonate		65	+
Sodium Bisulphate		25	+
Sodium Carbonate		25	+
Sodium Chloride		95	+
Sodium Hypochlorite	5%	65	+
Sodium Nitrate	100%	95	+
Sodium Silicate		25	+
Sodium Sulphate		95	+
Sulphuric Acid	1%	95	+
Sulphuric Acid	5%	65	+
Sulphuric Acid	10%	76	+
Sulphuric Acid	30%	25	+
Trisodium Phosphate		25	+
Water Sea/Tap	100%	50	+
Zinc Sulphate		65	+



Mechanical Properties:

- Tensile Strength:* 20 - 30.6 kgf/mm²
- Compression Strength:* 20 - 30.6 kgf/mm²
- Flexural Strength:* 20 - 30.6 kgf/mm²
- Shear strength:* 6.1 kgf/mm²
- Impact Strength:* 60 - 90 kgfcm/cm²
- Density:* 1.7 - 1.9 g/cm³

Electrical Properties:

- Dielectric Strength:* 7 - 15 kV/mm
- Insulation Resistance:* 10¹³ - 10¹⁶ ohm

Thermal Properties:

- Thermal Conductivity:* 0.2 - 0.3 kcal/(mh °C)
- Oxygen Index:* 42%
- Operating Temperature:* -140 to +120 °C

Weather Resistance:

- Water Absorption:* 24 h = 0.15%
4 days = 0.25%
- Weight Increase:* After 500 h = 0.7%

MITA pultruded profiles display excellent resistance to the effects of uv and weathering. It is not necessary to prepare cut ends or drilled holes with any additional treatment.

Temperature and Fire:

Standard material conforms to:
Surface flame spread test according to BS 476: Part 7: Class 2 (Two).
GRP increases in strength at temperatures below -140 °C.

Additional Notes on Fibarack™ GRP Ladder

The working (allowable) load capacity of a GRP cable tray/ladder, represents the ability to support a static weight of cables. It is equivalent to the destruction load capacity, as determined by testing in accordance with NEMA FG1, with a minimum safety factor of 1.5.

GRP with Anti-Static Finish

For areas where it is important that the GRP material displays anti-static properties, a more conductive material is available. The material has been independently tested to BS 2782 1982 Surface Conductivity. Details are available on request.

Temperatures		Polyester Resin % of Strength
°F	°C	
75	25	100
100	38	90
125	50	78
150	68	68
175	79	60
200	90	52

NEMA FG1 - CLASSIFICATION TABLE 4 - 1 ADDITIONAL LOAD/SPAN DATA			
Span (ft)	A lbs/ft	B lbs/ft	C lbs/ft
20	50	75	100
18	61	92	123
16	78	117	156
14	100	150	200
12	139	200	-
10	200	-	-

WARNING - PLEASE NOTE:

MITA POWERCOMPONENTS Products are designed for use as cable support systems only.

DO NOT USE AS WALKWAYS

GRP TECHNICAL GUIDE

For advice on any specific installation, please contact our technical sales department - Tel: +44 (0)1745 586011 Fax: +44 (0)1745 586015

TECHNICAL DATA ON GRP FIBASTRUT SECTIONS : GS0 / GS1 / GS1-NFR / GS2 / GS3 / GS2D

Ref.	ELEMENT OF SECTIONS:		I = MOMENT OF INERTIA		Z = SECTION MODULUS		Mb = BENDING MOMENT		Usage
	Area	Weight / m	X-X AXIS		Y-Y AXIS				
No.	(mm ²)	(kg/m)	I	Z	Mb	I	Z	Mb	
	(mm ²)	(kg/m)	(mm ⁴)	(mm ³)	(kgfm)	(mm ⁴)	(mm ³)	(kgfm)	
GS0	396	0.75	36 000	2 572	31.475	83 000	4 368	53.470	Light Duty
GS1	466	0.84	79 735	3 269	33.344	126 690	6 092	62.139	General Duty
GS1-NFR	468	0.84	79 735	3 269	33.344	126 690	6 092	62.139	General Duty*
GS2	485	0.87	108 436	5 216	53.198	130 613	6 295	64.205	Medium Duty
GS3	611	1.10	144 858	6 672	68.053	174 969	8 044	82.054	Heavy Duty
GS2D	1352	2.40	725 600	17 583	215.208	333 800	16 173	197.858	Extra Heavy Duty

* = None Flame Retardant Material Properties

MAX. LOAD AND DEFLECTION TABLE FOR VARIOUS SECTIONS:

Simple Beam

Span L (mm)	Max. uniformly distributed load (W) X-X Axis										Max. uniformly distributed load (W) Y-Y Axis									
	GS0		GS1		GS2		GS3		GS2D		GS0		GS1		GS2		GS3		GS2D	
	W (kgf)	d (mm)	W (kgf)	d (mm)	W (kgf)	d (mm)	W (kgf)	d (mm)	W (kgf)	d (mm)	W (kgf)	d (mm)	W (kgf)	d (mm)	W (kgf)	d (mm)	W (kgf)	d (mm)	W (kgf)	d (mm)
1.000	252	36	267	17	426	20	544	19	1722	12	428	26	497	20	514	17	656	19	1583	24
1.250	201	56	213	27	340	39	436	30	1377	19	342	41	398	31	411	32	525	30	1266	38
1.500	168	80	178	38	284	68	363	43	1148	27	285	59	331	45	342	56	438	43	1055	54
1.750	144	109	152	52	243	107	311	59	984	37	244	81	284	61	294	89	375	59	904	74
2.000	126	143	133	68	213	160	272	77	861	48	214	105	249	80	257	133	328	77	791	97
2.250	112	181	119	86	189	228	242	97	765	61	190	133	221	101	228	190	292	97	703	123
2.500	101	223	107	107	170	313	218	120	689	76	171	164	199	125	205	260	263	120	633	151
2.750	92	270	97	129	155	417	198	145	626	92	156	199	181	152	187	346	239	145	576	183
3.000	84	321	89	154	142	541	181	173	574	109	143	237	166	180	171	449	219	172	528	218



ORDERING INFORMATION

The catalogue illustrates and details the standard product with its appropriate reference number. We also offer a wide range of alternative configurations. To select an alternative product add NS to the standard product reference number and specify in full the desired configuration and options. The sequence for the part numbers relating to the alternatives is given below:

1 STRAIGHT LENGTHS

Example:

	GXL	500	NS	-2 -1 -1M	I AS	S500 S250 S300	SS GRB	-3 -6	A U D
Basic Style									
Width									
Non-Standard									
Class 2 as standard, alt Class 1; -1M denotes Modar Resin									
Conductivity: Insulating as standard, Alt Anti-static									
Rung Spacing: Ladder) Hole Spacing: Tray) Standard 500mm Alt 250/300mm									
Accessories used in Ladder assembly: 316 Stainless Steel as standard, Alt Grilon									
Length: 3 metres as standard, Alt 6 metres									
Rung Orientation: A - Alternate; U-Up; D-Down									

Therefore using this sequence a typical part number may be: **GXL150/NS/-1/AS/S300/SS/-6/U**

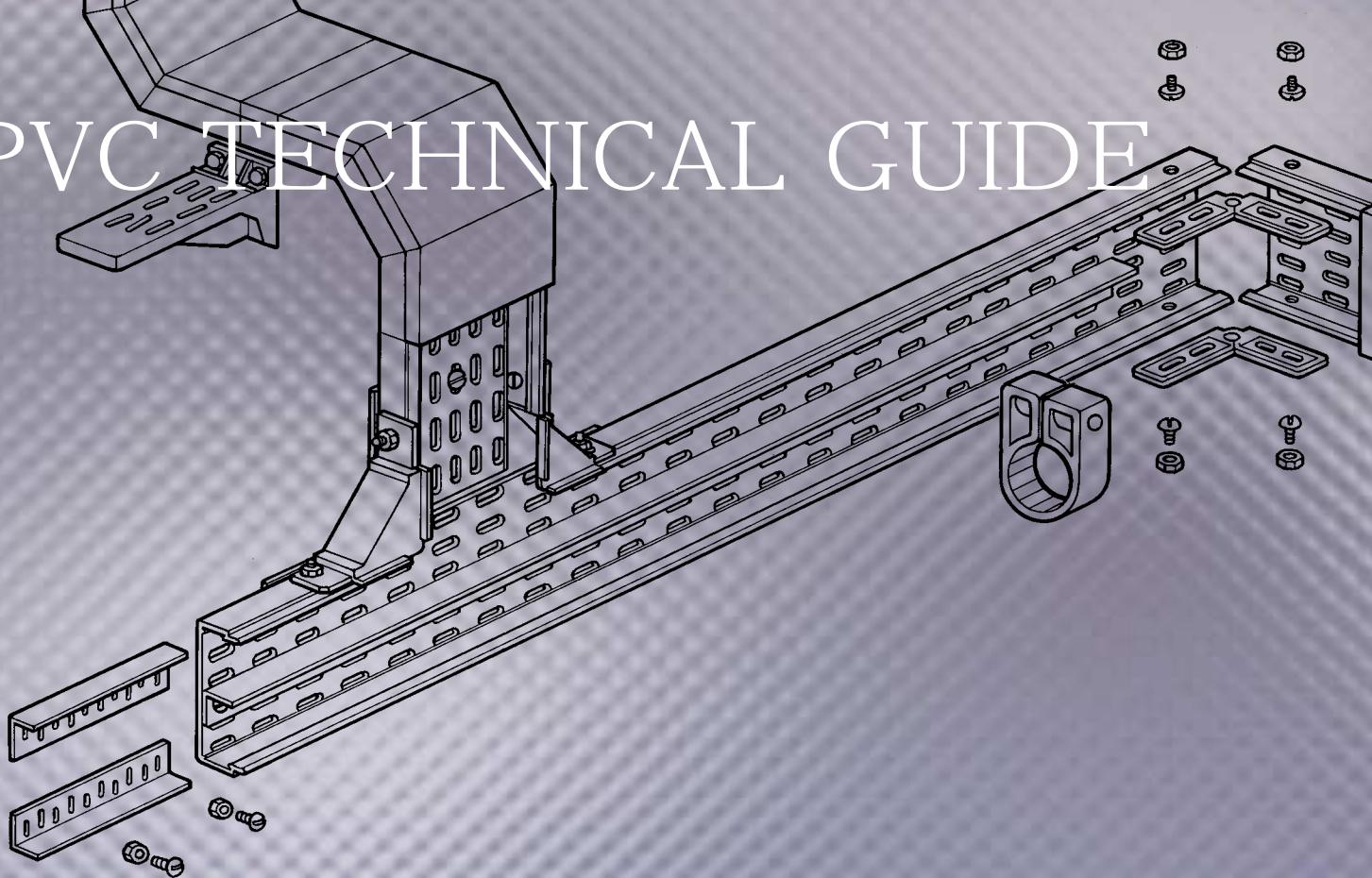
2 FITTINGS

Example:

	GXA	500	NS	-2 -1 -1M	I AS	R300 R600 R900	A45 A90 A30 A60	A U D
Basic Style								
Width								
Non-Standard								
Class 2 as standard, alt Class 1								
Conductivity: Insulating as standard, Alt Anti-static								
Radii: 300mm as standard, Alt 600, 900mm								
Angle: 45° 90° as standard, Alt 30° 60°								
Rung Orientation: A - Alternate; U-Up; D-Down								

Therefore using this sequence a typical part number may be: **GRA300/NS/-1/AS/R300/A60/A**

PVC TECHNICAL GUIDE



CHARACTERISTICS OF MITA INDUSTRIAL RIGID PVC PRODUCTS

Physical and Mechanical Properties

Specific weight:	DIN 53479 1.5 km/dm ³
Water absorption:	DIN 53475 0.2 mg/cm ²
Modulus of elasticity:	DIN 53457 34.000
Tensile strength:	DIN 53455 470 kg/cm ²
Elongation at breaking load:	DIN 53455 5%
Hardness: Rockwell scale (A):	90
Shore D (B):	84

Thermal Properties

Temperature VICAT:	DIN 53460 82 °C
Thermal conductivity:	DIN 52612 0.14 Kcal/Mh °C
Linear coefficient of thermal expansion:	DIN 53328 6.5 x 10 ⁻⁵ / °C
Self-extinguishability:	94-V0

Electrical Properties

Dielectric strength:	DIN 53481 450 kv/cm
Dielectric constant:	DIN 53483 3,4 approx.
Specific resistance:	DIN 53482 3·10 ¹⁵ Ohm.cm.

Resistance to various chemical agents

The properties indicated below are purely by way of information based on tests carried out by the manufacturers of the rigid PVC. For installations in individual ambient conditions it is recommended that tests be carried out prior to use.

Working Temperature Range

Resists temperature normally from -20 °C to +60 °C. Should not be subjected, however, to impact at very low temperatures.

Chemical agent	Concentration	Temp °C	resistance
			+ Resistant - non-resistant ● some resistance
Mineral Oils	commercial	60	+
Lead acetate	saturated	50	+
Acetone	100%	20	-
Acetic acid (solution)	25%	40	+
Hydrochloric acid (solution)	30%	40	+
Nitric acid (solution)	30%	50	+
Sulphuric acid (solution)	40%	40	+
Water	100%	40	+
Sea water	-	60	●
Benzene	100%	20	-
Butadiene	50%	60	+
Butane gas	-	20	+
Butanol	10%	20	+
Phenol (solution)	90%	45	●
Formaldehyde	diluted	40	+
Petrol	100%	60	+
Glycerine	-	60	+
Hydrogen	100%	60	+
Milk	commercial	20	+
Methanol	100%	40	+
Naphthalene	-	20	-
Ozone	100%	20	+
Potassium (solution)	40%	40	+
Liquid propane	100%	20	+
Photographic developer	commercial	40	+
Copper sulphate (solution)	diluted	40	+
Zinc sulphate (solution)	diluted	40	+
Toluene	100%	20	-
Trichlorethylene	100%	20	-
Beer	-	60	+
Chlorine (Dry Gas)	100%	60	●
Synthetic Detergent	100%	60	+

THERMAL EXPANSION
uPVC is subject to thermal expansion and contraction, therefore, care should be taken to ensure that the tray is well supported along its length, and not rigidly fixed to any base or support structure.

Any holes drilled in the tray for screw or bolt fixings should be well oversize to allow for movement due to temperature fluctuations and it is recommended that nylon washers be used under screw or bolt heads.

A gap should be left between adjoining lengths to allow for expansion, 2–3mm will be sufficient for most needs but where extremes of temperature change are envisaged a gap of 6mm should be left.

Coupling bolts should not be over tightened.

LOAD - SPAN - DEFLECTION COMPARISON TABLE FOR MITA INDUSTRIAL TRUNKING, TRAYS, DUCTS & LADDERS

CONTINUOUS BEAM:- RESTRICTED DEFLECTION / LOAD @ $d = L/200$

		UNIFORMLY DISTRIBUTED LOAD W IN (kgf) PER SPAN L IN (m) and DEFLECTION d IN (mm)																				
Span L (m)	>	1.00m	1.25m	1.50m	1.75m	2.00m	2.25m	2.50m	2.75m	3.00m	3.25m	3.50m	3.75m	4.00m	4.25m	4.50m	4.75m	5.00m	5.25m	5.50m	5.75m	6.00m
d = L/200	>	5.00	6.25	7.50	8.75	10.00	11.25	12.50	13.75	15.00	16.25	17.50	18.75	20.00	21.25	22.50	23.75	25.00	26.25	27.50	28.75	30.00
Load (kgf)	>	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
uPVC - CABLE TRAY:- MITA TRAY																						
Ref. No.	50mm HIGH SERIES																			Restricted Deflection is greater than maximum Deflection		
MT50-5	48	30	21	16	12	Spans are not recommended																
MT175-5	55	35	24	18	14																	
MT100-5	61	39	27	20	15	12																
MT150-5	69	44	31	22	17	14																
60mm HIGH SERIES																						
MT100-6	228	146	102	75	57	45	36	30	25	22	19	Spans are not recommended										
MT150-6	265	170	118	87	67	53	42	35	29	25	22	19										
MT200-6	317	203	141	104	80	63	51	42	35	30	26	23	20									
MT300-6	358	230	160	117	90	71	58	47	40	34	29	26	22									
100mm HIGH SERIES																						
MT300-10	1628	1042	724	532	407	322	261	216	181	155	133	116	102	91	81	73	66	60	54	50	46	
MT400-10	2143	1372	953	700	536	424	343	284	238	203	175	153	134	119	106	95	86	78	71	65	60	
MT600-10	2431	1612	1120	823	630	498	403	333	280	239	206	180	158	140	125	112	101	92	84	77	70	
GRP - CABLE DUCT AND TRAY:- FIBATRUNK (c/w Lid)																						
GT50-5	214	172	125	92	71	56	45	37	31	27	23	20	Spans are not recommended									
GT80-8	514	411	342	294	257	212	172	142	119	102	88	76	67	59	53	48	43	39	35	32	30	
GT120-12	1111	889	741	635	556	494	444	404	370	328	283	246	216	192	171	153	138	126	114	105	96	
GT140-7	439	351	293	251	220	178	144	119	100	85	74	64	56	50	45	40	36	33	30			
GT140-10	824	659	549	471	412	366	330	299	252	214	185	161	142	125	112	100	91	82	75	69	63	
GRP - CABLE TRAY:- FIBATRAY																						
GF73-2	109	70	48	35	27	21	17	14	Spans are not recommended													
GF100-5	416	333	260	191	146	116	94	78	65	56	48	42	37	32	29	26						
GF150-5	378	303	252	216	185	146	119	98	83	70	61	53	46	41	37	33	30	27				
GF200-5	341	273	228	195	171	140	114	94	79	67	58	51	44	39	35	31	28					
GF300-5	354	282	235	202	177	152	123	104	86	73	63	55	48	43	38	34	31	28				
GF400-6	1255	1004	837	717	628	558	502	415	349	297	256	223	196	174	155	139	126	114	104	95	88	
GRP - CABLE DUCTING:- FIBADUCT "CABSYS" (Lid to be ordered separately)																						
60mm HIGH SERIES																						
GRP100-6	471	377	313	230	176	139	113	93	79	67	58	50	44	39	35	31	28	Spans are not recommended				
GRP150-6	499	399	333	268	206	163	132	109	92	78	67	59	52	45	41	36	33	30				
GRP200-6	516	413	344	295	226	179	145	120	101	86	74	65	57	50	45	40	36	33	30	30		
GRP300-6	536	429	357	306	254	201	163	134	113	96	83	72	64	57	50	45	41	37	34	31		
80mm HIGH SERIES																						
GRP100-8	716	573	478	410	345	273	221	183	154	131	113	98	87	77	69	62	56	50	46	42	38	
GRP150-8	763	611	509	436	382	318	258	213	179	153	132	115	101	90	80	72	65	59	54	47	45	
GRP200-8	793	635	529	453	397	352	285	236	198	169	146	127	112	99	88	79	72	65	59	54	50	
GRP300-8	829	663	553	474	415	369	323	267	224	191	165	144	126	112	100	90	81	74	67	61	56	
GRP400-8	849	680	566	486	425	378	340	287	241	206	178	155	136	121	108	97	87	79	72	66	61	
110mm HIGH SERIES																						
GRP100-110	1165	932	777	665	583	518	466	394	331	282	243	212	186	165	147	132	119	108	99	90	83	
GRP150-110	1247	998	832	713	624	555	499	454	385	328	283	247	217	192	171	154	139	126	115	105	97	
GRP200-110	1303	1042	869	745	652	579	521	474	427	364	314	274	241	213	190	171	154	140	127	117	107	
GRP300-110	1372	1097	915	784	686	610	549	499	458	416	359	312	275	243	217	195	176	160	146	133	122	
GRP400-110	1413	1131	942	808	707	628	566	514	471	435	389	339	298	264	236	212	191	173	158	145	133	
110mm HIGH SERIES																						
GLL - Range	1015	812	677	580	508	451	406	369	338	312	269	235	206	183	163	146	132	120	109	100	92	
GML - Range	1431	1144	954	817	715	636	572	520	477	440	409	381	358	337	314	282	255	231	211	193	177	
GNL - Range	3622	2897	2414	2069	1811	1610	1449	1317	1207	1114	1035	966	905	852	805	762	724	690	658	630	604	
GKL - Range	5457	4366	3638	3118	2729	2425	2183	1984	1819	1679	1559	1455	1364	1284	1213	1149	1091	1039	992	949	910	
GHL - Range	5052	4020	3350	2872	2513	2233	2010	1827	1675	1546	1436	1340	1256	1182	1117	1058	1005	957	914	874	838	
GXL - Range	5823	4658	3882	3327	2919	2588	2329	2117	1941	1792	1664	1553	1456	1370	1294	1226	1165	1109	1059	1013	971	

To obtain load per metre, divide the load per given span by that span.

ALL LOAD & DEFLECTION FIGURES ARE THEORETICAL ONLY, FOR ANY GIVEN SITE SITUATION SEEK ADVICE FROM MITA'S TECHNICAL PERSONNEL.