TECHNICAL MANUAL · 2026 EDITION

FRP Profile
Design Manual

PULTRUDED STRUCTURAL PROFILES · E23 GRADE

Unlocking the power of composites.

Engineered for heavy-duty structures.

F1 · FRP PROFILE · DOC-PF-2026-EN · REV. A · 04/2026

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01

Product Range

F1 Composites carries a complete range of pultruded FRP structural profiles — equal angle, channel, wide flange beam, box section, tube, handrail, kickplate, and window and door frames — supplied as standard in Epoxy resin, RAL 7043 dark grey, with RAL 1023 safety yellow available on selected items.

About F1 FRP Profile

Glass Reinforced Polymer (GRP / FRP) is a composite material made of a thermosetting polymer resin reinforced by continuous glass fibres, combined with selected additives. Commonly referred to as fibreglass, it delivers the strength of traditional structural metals at a fraction of the weight — while remaining fully corrosion-resistant, non-conductive and virtually maintenance-free.

F1 Composites operates one of the most comprehensive pultrusion lines for structural FRP in the region, manufacturing profiles in standard 6 m lengths. Our range covers all common section types — angle, channel, box, tube, wide flange beam and more — engineered to **BS EN 13706 E23 Grade** as a minimum performance benchmark.

Key Benefits

BENEFIT	DESCRIPTION
E23 Grade Performance	Full-section tensile modulus averaging 30 GPa versus the 23 GPa E23 requirement
Corrosion Resistant	Impervious to salt spray, industrial chemicals and most atmospheric pollutants
Fire Rated	BS 476 Part 7 Class 2 standard. Class 1 available on request
High Load Bearing	Approximately one-quarter the weight of steel with a comparable strength-to-weight profile
Non-Conductive	Electrically and thermally insulating — ideal for substations and rail-side applications
Maintenance Free	No painting, staining or galvanising required. 25-year warranty, 60-year design life

Typical Applications

Work and public platforms, sub-floor and mezzanine structures, bridge decks, ladders and staircases, cable trays, protective screens, rail-side refuge platforms, chemical plant walkways, offshore access structures and wastewater facility crossings.

Standard Colours

COLOUR	DETAILS
RAL 7043 · Dark Grey	Standard stock colour across all profiles
RAL 1023 · Safety Yellow	High-visibility option on selected items
Custom Colour / Resin	MOQ applies · Vinylester / Epoxy/Polyurethane/Phenolic available

► About F1 Composites

Standard stock profiles are supplied in 6 m lengths. Cut-to-size fabrication is available through our in-house workshop. Contact your F1 Composites representative to discuss non-standard dimensions, alternative resin systems or bespoke colour requirements.

Standard Profile Components

The F1 FRP system provides engineers with extraordinary design freedom. The following nine standard section types cover the majority of structural applications, and are fully interoperable — allowing complete platforms, staircases, bridges and handrail systems to be assembled from a single supply base.

Profile Families

COMPONENT	PRIMARY USE
Angle	Corner connections, bracing, edge frames
Channel	Primary & secondary load-bearing beams
Top Rail	Ergonomic handrail top with rounded contour
Box Channel	Lightweight structural members
I-Beam	Flexural-loaded structural beams
Tube (Ø38 / Ø50)	Handrail posts, mid-rails, light structural
Kick Plate	Perimeter foot protection on platforms
Wide Flange Beam	Primary beams for heavy loads & long spans
Box Section	Columns, load-bearing uprights

Typical Structural Assembly

In a complete industrial access platform, box sections typically serve as columns, channels and wide flange beams form primary and secondary load-bearing members, tubes combined with the top rail create the handrail system, angles resolve nodal connections, and the kickplate delivers foot-level safety containment.

► Custom Fabrication

Beyond stock sizes, F1 Composites operates multiple pultrusion tool sets. Non-standard cross-sections, custom lengths and alternative resin systems (Epoxy / Vinylester / Phenolic) are available to order.

Load & Deflection Data

The technical specifications presented in Section 2 are based on a **simply supported beam** model, listing mid-span deflection (mm) for two standard load scenarios across a range of spans.

Load Scenarios

LOAD TYPE	DESCRIPTION
Point Load (PL)	Concentrated load applied at mid-span via a 200 × 200 mm plate
Uniformly Distributed Load (UDL)	Load evenly distributed over the full span (N/m)

Deflection Limits

LIMIT	APPLICATION
L / 200	Typical limit for pedestrian-rated load-bearing platforms with comfort requirements
L / 100	Acceptable for light-duty or short-term/temporary structures

Selection Workflow

STEP	ACTION
1	Define the load case and required span
2	Locate the appropriate profile specification table
3	Check mid-span deflection against the allowable limit
4	Review connection requirements and buckling considerations
5	Verify the final design with F1 Composites' engineering team

> **► Engineering Support**
>
> For complex or safety-critical applications, F1 Composites' engineering team provides full structural verification, connection design and fabrication drawings. Contact us early in the design phase to optimise profile selection and reduce overall project cost.

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Technical Specs

Detailed cross-section geometry, section properties, E23-grade material properties and span–load deflection data for every profile in the F1 standard range. All values are based on Epoxy resin (FL-P22 formulation) and simply supported boundary conditions.

Equal Angle — 50 × 50 × 6.35 mm

F1-ANG-050 · EPOXY RESIN · RAL 7043

Dimensions

LENGTH (MM)	6000
Height (mm)	50
Width (mm)	50
Thickness (mm)	6.35
Colour	Dark Grey
Area (mm^2)	593
Mass (kg/m)	1.22
MOI X / Y (mm^4)	49,900

E23 Grade Material Properties

PROPERTY	UNIT	TEST METHOD	VALUE
Full Section Test	GPa	EN 13706-2 Annex D	**23**
Tensile Modulus (Axial / Transverse)	GPa	EN ISO 527-4	**23 / 7**
Tensile Strength (Axial / Transverse)	MPa	EN ISO 527-4	**240 / 50**
Flexural Strength (Axial / Transverse)	MPa	EN ISO 14125	**240 / 100**
Pin-bearing Strength (Axial / Transverse)	MPa	EN 13706-2 Annex E	**150 / 70**
Interlaminar Shear Strength (Axial)	MPa	EN ISO 1430	**25**

Point Load — Mid-Span Deflection (mm)

PL	500	600	700	800	900	1000	1100	1200
0.25 kN	0.20	0.35	0.56	0.84	1.19	1.64	2.18	2.83
0.50 kN	0.41	0.71	1.12	1.67	2.38	3.27	4.35	5.65
0.75 kN	0.61	1.06	1.68	2.51	3.57	4.90	6.52	8.46
1.00 kN	0.82	1.41	2.24	3.34	4.76	6.53	8.69	11.28
1.50 kN	1.22	2.11	3.36	5.01	7.14	9.79	13.03	16.92
L/200 Limit	**2.50**	**3.00**	**3.50**	**4.00**	**4.50**	**5.00**	**5.50**	**6.00**

Uniformly Distributed Load — Mid-Span Deflection (mm)

UDL	500	600	700	800	900	1000	1100	1200
250 N/m	0.06	0.13	0.25	0.42	0.67	1.02	1.50	2.12
500 N/m	0.13	0.26	0.49	0.84	1.34	2.04	2.99	4.24
750 N/m	0.19	0.40	0.74	1.25	2.01	3.06	4.48	6.35
1000 N/m	0.26	0.53	0.98	1.67	2.68	4.08	5.98	8.46
1500 N/m	0.38	0.79	1.47	2.51	4.02	6.12	8.96	12.69
L/200 Limit	**2.50**	**3.00**	**3.50**	**4.00**	**4.50**	**5.00**	**5.50**	**6.00**

Angle Range Summary

Larger equal-angle sections extend the F1 range up to 152 × 152 × 12.7 mm, enabling longer unsupported spans and heavier point loads. Section geometry and material grade remain fully E23 compliant across the family.

Section Properties Overview

DESIGNATION	DIMENSIONS (MM)	AREA (MM²)	MASS (KG/M)	MOI X/Y (MM⁴)	TYPICAL SPAN
F1-ANG-050	50 × 50 × 6.35	593	1.22	49,900	**up to 1.2 m**
F1-ANG-076	76 × 76 × 9.5	1,353	2.77	258,382	**up to 2.2 m**
F1-ANG-102	102 × 102 × 12.7	2,428	4.98	832,120	**up to 3.0 m**
F1-ANG-152	152 × 152 × 12.7	3,698	7.58	1,856,039	**up to 3.0 m**

Angle 76 × 76 × 9.5 mm — Point Load Deflection (mm)

PL	1500	1600	1700	1800	1900	2000	2100	2200
0.50 kN	2.10	2.55	3.06	3.63	4.28	4.99	5.78	6.64
1.00 kN	4.19	5.09	6.10	7.24	8.52	9.94	11.51	13.24
1.50 kN	6.28	7.62	9.14	10.86	12.77	14.90	17.24	19.83
L/200 Limit	**7.50**	**8.00**	**8.50**	**9.00**	**9.50**	**10.00**	**10.50**	**11.00**

Angle 102 × 102 × 12.7 mm — Point Load Deflection (mm)

PL	2300	2400	2500	2600	2700	2800	2900	3000
0.50 kN	2.36	2.69	3.04	3.42	3.83	4.28	4.75	5.27
1.00 kN	4.69	5.33	6.03	6.79	7.60	8.48	9.42	10.44
1.50 kN	7.02	7.98	9.02	10.15	11.37	12.68	14.09	15.61
2.00 kN	9.35	10.63	12.01	13.52	15.14	16.89	18.76	20.78
L/200 Limit	**11.50**	**12.00**	**12.50**	**13.00**	**13.50**	**14.00**	**14.50**	**15.00**

► Selection Tip

For equal-angle applications above 2 m span under significant point loads, prefer the 102 × 102 or 152 × 152 sections to keep deflections within L/200. For longer spans or continuous distributed loads, channel or wide-flange beam profiles offer substantially greater flexural efficiency.

Square Box Section

F1-BOX-050 · 50 × 50 × 6.35 MM · EPOXY RESIN · GREY / YELLOW

Dimensions & Properties

LENGTH (MM)	6000
Height × Width (mm)	50 × 50
Wall Thickness (mm)	6.4
Area (mm²)	1,090
Mass (kg/m)	2.23
MOI X / Y (mm⁴)	348,404
Colours	Dark Grey / Safety Yellow

Box 50 × 50 — Point Load Deflection (mm)

PL	700	800	900	1000	1100	1200	1300	1400
0.50 kN	0.43	0.65	0.92	1.26	1.68	2.18	2.78	3.47
1.00 kN	0.87	1.29	1.84	2.52	3.36	4.36	5.55	6.93
1.50 kN	1.30	1.94	2.76	3.78	5.04	6.54	8.31	10.38
2.00 kN	1.73	2.58	3.68	5.04	6.71	8.71	11.08	13.84
3.00 kN	2.59	3.87	5.51	7.56	10.07	13.07	16.62	20.75
L/200 Limit	**3.50**	**4.00**	**4.50**	**5.00**	**5.50**	**6.00**	**6.50**	**7.00**

Family Comparison — Section Properties

DESIGNATION	SECTION (MM)	WALL T (MM)	AREA (MM²)	MASS (KG/M)	MOI X/Y (MM⁴)
F1-BOX-050	50 × 50	6.4	1,090	2.23	**348,404**
F1-BOX-064	64 × 64	6.4	1,456	2.98	**807,124**
F1-BOX-076	76 × 76	6.4	1,751	3.59	**1,416,381**
F1-BOX-101	101 × 101	8.0	2,957	6.06	**4,275,367**

Channel Section

Channel profiles form the backbone of most F1 platform and walkway systems, providing excellent flexural capacity along the major axis and straightforward bolt-up connections to grating panels.

F1-CHN-203 · 203 × 55 × 9.5 MM · EPOXY RESIN · RAL 7043

Dimensions & Properties

LENGTH (MM)	6000
Height (mm)	203
Width (mm)	55
Thickness (mm)	9.5
Area (mm²)	2,796
Mass (kg/m)	5.73
MOI X (mm⁴)	14,746,788
MOI Y (mm⁴)	611,595

Channel Family — Section Properties

DESIGNATION	H × W × T (MM)	AREA (MM²)	MASS (KG/M)	MOI X (MM⁴)	MOI Y (MM⁴)
F1-CHN-100	100 × 60 × 5.5	1,153	2.36	1,803,769	**405,194**
F1-CHN-203	203 × 55 × 9.5	2,796	5.73	14,746,788	**611,595**
F1-CHN-254	254 × 72 × 12.7	4,736	9.71	39,327,465	**1,809,576**
F1-BCH-203	203 × 55 × 8 (box)	3,207	6.57	16,701,112	**1,442,018**

Channel 203 × 55 × 9.5 — Point Load Deflection (mm)

PL	2600	2800	3000	3200	3400	3600	3800	4000
3.00 kN	3.25	4.07	5.00	6.07	7.28	8.65	10.17	11.87
4.00 kN	4.34	5.42	6.66	8.09	9.70	11.52	13.55	15.81
5.00 kN	5.42	6.77	8.32	10.10	12.12	14.39	16.93	19.75
6.00 kN	6.50	8.12	9.99	12.12	14.54	17.26	20.30	23.68
L/200 Limit	**13.00**	**14.00**	**15.00**	**16.00**	**17.00**	**18.00**	**19.00**	**20.00**

Circular Tube & Top Rail

Tubes and top rail sections together form the F1 standard handrail system, available in grey or high-visibility yellow. The top rail features a rounded upper profile for comfortable manual contact and effective hand-over-hand gripping.

F1-TUB-050 · TUBE Ø 50 MM · EPOXY RESIN · GREY / YELLOW

Tube Dimensions & Properties

LENGTH (MM)	6000
Outer Diameter (mm)	50
Wall Thickness (mm)	6.0
Area (mm²)	830
Mass (kg/m)	1.70
MOI X / Y (mm⁴)	204,442

Tube Ø 50 — UDL Deflection (mm)

UDL	800	900	1000	1100	1200	1300	1400	1500
500 N/m	0.57	0.91	1.39	2.03	2.88	3.97	5.34	7.03
1000 N/m	1.14	1.82	2.77	4.06	5.75	7.92	10.66	14.04
1500 N/m	1.70	2.73	4.16	6.09	8.62	11.88	15.97	21.05
2000 N/m	2.27	3.64	5.54	8.12	11.49	15.83	21.29	28.06

F1-RAL-071 · TOP RAIL 71 × 60 × 4.5 MM · ERGONOMIC HANDRAIL

Top Rail Dimensions & Properties

LENGTH (MM)	6000
Height × Width (mm)	60 × 71
Wall Thickness (mm)	4.5
Area (mm²)	2,004
Mass (kg/m)	1.42
MOI X / Y (mm⁴)	3,448,522 / 1,679,100
Colours	Dark Grey / Safety Yellow

Wide Flange Beam (WFB)

F1 Wide Flange Beams are the workhorse of large-scale FRP platforms and bridge decks, offering the highest moment of inertia per unit weight in our product range. Three stock sizes cover spans from 3 to 5+ metres under heavy distributed loads.

WFB Range — Section Properties

DESIGNATION	H × W × T (MM)	AREA (MM²)	MASS (KG/M)	MOI X (MM⁴)	MOI Y (MM⁴)
F1-WFB-152	152 × 152 × 9.5	4,161	8.53	16,584,776	**5,548,195**
F1-WFB-203	203 × 203 × 12.7	7,421	15.21	52,750,695	**17,698,331**
F1-WFB-305	305 × 305 × 12.7	11,308	23.18	188,894,145	**60,014,404**

F1-WFB-203 · FEATURED PROFILE

WFB 203 Dimensions

LENGTH (MM)	6000
Height × Width (mm)	203 × 203
Thickness (mm)	12.7
Colour	Dark Grey RAL 7043
Area (mm²)	7,421
Mass (kg/m)	15.21
Steel Equivalent Weight	≈ ¼ of S275 beam

WFB 203 — UDL Deflection (mm)

UDL	3600	3800	4000	4200	4400	4600	4800	5000
2000 N/m	3.64	4.52	5.54	6.74	8.12	9.70	11.50	13.54
3000 N/m	5.44	6.76	8.30	10.08	12.14	14.51	17.20	20.25
4000 N/m	7.25	9.00	11.05	13.43	16.17	19.32	22.91	26.97
5000 N/m	9.05	11.24	13.80	16.77	20.20	24.13	28.61	33.68
L/200 Limit	**18.00**	**19.00**	**20.00**	**21.00**	**22.00**	**23.00**	**24.00**	**25.00**

> **► Design Note**
>
> For the largest WFB 305 section, significant load capacity remains well below the L/200 limit even at 5 m spans — making it the preferred choice for bridge decks, heavy access platforms and load-bearing floor systems.

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03

Applications

From rail-side refuge platforms and chemical plant access walkways to multi-level staircases and heavy-duty support structures, F1 FRP profiles are specified wherever corrosion, electrical safety or weight savings demand more than conventional steel.

Typical Applications

The F1 FRP profile range supports a wide spectrum of heavy-duty structural applications. Below are six representative installation categories — each demonstrating how the standard components can be combined into complete, engineered systems.

APPLICATION	DESCRIPTION
Access Platform	Elevated walkways with integrated grating, handrail and kick plate — widely used in process plants and maintenance access.
Embankment Staircase	Outdoor stairways with anti-slip treads and high-visibility yellow nosings for rail, civil and infrastructure access.
Heavy-Duty Support Structure	Multi-level FRP framing with braced columns, primary and secondary beams — fully non-corroding and non-conductive.
Rail Refuge Platform	Non-conductive FRP refuge platforms installed adjacent to energised rail infrastructure, combining safety and durability.
Raised Walkway	Elevated pedestrian walkways supported on trestles — ideal for plant yards, outdoor facilities and wet environments.
Plant Access Stair	Step-over and machinery-access stair systems — pre-fabricated for direct bolt-up installation on site.

Industry Sectors

SECTOR	TYPICAL APPLICATIONS
Rail & Infrastructure	Refuge platforms, trackside access, cable bridges, signaling gantries
Chemical & Process	Walkways, platforms, tank access, pipe supports, containment
Water & Wastewater	Treatment plant crossings, aerator walkways, screening platforms
Offshore & Marine	Deck gratings, access ladders, corrosion-resistant structures
Power & Utilities	Substation platforms, non-conductive access, insulated ladders
Industrial Buildings	Mezzanines, plant floors, equipment platforms, stair towers

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04

Materials & Standards

F1 FRP profiles are pultruded from continuous E-glass reinforcement and thermosetting polyester resin, benchmarked against BS EN 13706 E23 grade. This section summarises composition, chemical resistance and fire certification achievements across the F1 product portfolio.

Materials & Standards

Material Composition

CONSTITUENT	SHARE	DESCRIPTION
E-Glass Fibre	60%	**Unidirectional rovings, stitched chop-strand mat, woven roving — primary structural strength**
Polyester Resin	30%	**Isophthalic thermoset resin providing chemical resistance, weatherability and binding**
Additives	10%	**Pigments, UV inhibitors, fire retardants, surface veils and process aids**

Material Performance Summary

ATTRIBUTE	TEST METHOD	VALUE
UV Weathering Resistance	ISO 4892-2 Xenon Arc (5,000 hrs)	**Passed — colour & strength retained**
Fire Performance (Standard)	BS 476 Part 7	**Class 2**
Fire Performance (Enhanced)	BS 476 Part 7	**Class 1 (on request)**
Structural Grade	BS EN 13706-2	**E23 (tested ≈ 30 GPa)**
Design Life	Manufacturer specification	**60 years**
Warranty	—	**25 years (subject to terms)**

Available Resin Systems

RESIN SYSTEM	PROPERTIES & APPLICATIONS
Epoxy	Standard stock; suitable for most industrial and infrastructure applications
Ortho Polyester	Cost-optimised option for less demanding environments
Vinylester	Enhanced chemical and corrosion resistance for aggressive environments
Phenolic	Maximum fire performance, lowest smoke & toxicity emissions (limited range)

► Testing & Quality Assurance

Every production batch is subject to dimensional, surface and mechanical verification. Full-section tests routinely exceed the BS EN 13706 E23 benchmark, with typical tensile modulus around 30 GPa against the 23 GPa grade requirement. Batch-specific test reports are available on request.

Chemical Resistance

F1 FRP profiles manufactured with standard Epoxy resin (FL-P22 formulation) exhibit broad chemical resistance across a wide temperature range. The following tables list recommended maximum service temperatures for common chemical exposures. For aggressive media or elevated temperatures, vinylester or phenolic resin systems are available on request.

CHEMICAL	CONCENTRATION	MAX. SERVICE TEMP.
Acetic Acid	< 5%	**65 °C**
Acetic Acid	25 – 40%	**35 °C**
Alum	saturated	**75 °C**
Ammonium Hydroxide	10%	**40 °C**
Ammonium Salts (generic)	saturated	**70 °C**
Animal Fat	100%	**110 °C**
Aviation Fuel (Avtag / Avtur)	100%	**55 – 60 °C**
Barium Salts	saturated	**75 °C**
Barium Hydroxide	any	**N/R**
Boric Acid	saturated	**70 °C**
Bromine Water	saturated	**30 °C**
Calcium Salts	saturated	**75 °C**
Carbon Dioxide (dry gas)	100%	**120 °C**
Carbon Tetrachloride	100%	**40 °C**
Castor Oil	100%	**110 °C**
Chloroacetic Acid	25 – 50%	**25 – 60 °C**
Chromic Acid	5 – 10%	**40 – 45 °C**
Chromic Acid	> 50%	**N/R**
Citric Acid	100%	**70 °C**
Diesel	100%	**120 °C**
Ethylene Glycol	100%	**100 °C**
Fatty Acid Esters	any	**85 °C**
Formic Acid	10%	**30 °C**
Formic Acid	100%	**N/R**
Gasoline / Petroleum	100%	**60 °C**
Glycerin	100%	**100 °C**

Chemical Resistance (continued)

CHEMICAL	CONCENTRATION	MAX. SERVICE TEMP.
Hydrochloric Acid	1 – 10%	**70 °C**
Hydrochloric Acid	fuming	**45 °C**
Hydrofluoric Acid	35%	**40 °C**
Hydrogen Peroxide	< 30%	**30 °C**
Hypochlorous Acid	10 – 50%	**45 °C**
Isopropyl Alcohol	100%	**30 °C**
Kerosene	100%	**60 °C**
Lactic Acid	10 – 80%	**80 °C**
Linseed / Lubricating / Olive Oil	100%	**110 °C**
Magnesium / Mercury / Nickel Salts	saturated	**75 °C**
Nitric Acid	2 – 10%	**35 – 40 °C**
Nitric Acid	≥ 15%	**N/R**
Oleic Acid / Stearic Acid	100%	**85 °C**
Oxalic Acid	20% / saturated	**60 °C**
Paraffin	100%	**110 °C**
Phthalate Esters	100%	**110 °C**
Potassium Hydroxide	10%	**20 °C**
Potassium Hydroxide	≥ 25%	**N/R**
Salt (Sodium Chloride)	saturated	**75 °C**
Sodium Hydroxide	10 – 25%	**25 °C**
Sodium Hypochlorite	≤ 20%	**60 °C**
Sulfuric Acid	1 – 5%	**65 °C**
Sulfuric Acid	10 – 70%	**40 – 45 °C**
Sulfuric Acid	≥ 75% / fuming	**N/R**
Toluene	100%	**40 °C**
Transformer Oil	100%	**110 °C**
Sea Water / Fresh Water	—	**70 – 75 °C**
Zinc Salts (generic)	saturated	**75 °C**

► Specialist Chemical Environments

For strong oxidising acids (nitric, chromic, sulfuric at high concentration), strong caustics, or elevated-temperature service, Epoxy resin is generally not suitable. F1 Composites offers vinylester and phenolic resin variants with significantly extended chemical resistance — contact our technical team with your exposure profile for a formal recommendation.

Fire Performance

F1 Composites is committed to fully transparent fire performance disclosure across its product range. All standard profiles are tested to recognised international fire classifications, with third-party certification available on request.

Fire Classification Summary

F1 PRODUCT RANGE	BS EN 13501	BS 476 PART 7	ADDITIONAL
Profile (Standard Range)	Class B fl s1	Class 2 & Class 1	**N/A**
Grating (Moulded)	Class B fl s1	Class 1	**N/A**
Grating (Pultruded)	Class B fl s1	Class 2	**—**
Stair Tread (FR Grade)	Class B fl s1	Class 2	**N/A**
Handrail System	N/A	Class 2	**N/A**
Platform System (Type 40)	Class B fl s1	Class 1	**39 min insulation**
Platform System (Type 100)	Class B fl s1	Class 1	**58 min insulation**
Aluminium Deck & Cladding	Class A2 fl s1	N/A	**N/A**

Understanding the Classifications

CLASSIFICATION	WHAT IT MEANS
BS 476 Part 7 Class 1	Highest spread-of-flame classification under BS 476 Part 7; limited surface spread of flame
BS 476 Part 7 Class 2	Good spread-of-flame performance; acceptable for most building regulation contexts in non-critical areas
BS EN 13501 Class B	European harmonised classification indicating very limited contribution to fire
BS 476 Part 20/21	Load-bearing fire resistance — duration for which a structure remains insulating and structurally sound

► Enhanced Fire Performance

Where project specifications demand higher fire performance than our standard range, F1 Composites offers phenolic-resin and FR-additive profile variants. Third-party test certificates covering BS 476, BS EN 13501 and load-bearing integrity tests are issued on a per-order basis.

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05

Working With Composites

Installation, cutting, handling, material safety and long-term maintenance — this final section provides the practical guidance needed to deploy F1 FRP profiles safely and effectively on site.

Safety, Tools & Handling

F1 FRP profiles install rapidly using conventional power tools, with weight approximately one-quarter that of equivalent steel sections. Correct tool selection, PPE and handling practices are essential to protect installers and to preserve the long-term integrity of the material.

On-Site Safety Essentials

- Verify the proposed design meets local building codes and regulations before starting work.
- Keep non-essential personnel clear of the work area until installation is complete.
- Refer to operators' manuals for all power tools in use.
- Wear long-sleeved clothing or disposable coveralls when cutting / grinding to limit dust contact.
- Always wear gloves and apply a suitable barrier cream when handling profiles to prevent abrasion.
- Use adequate eye protection and work in well-ventilated areas; respirators require a clean-shaven fit.

Required Tools

TOOL	PURPOSE
Measuring Tape	Dimensional marking and cutting measurements
Diamond Saw Blade	Clean cutting of FRP profiles — longest tool life
Safety Goggles	Eye protection during cutting and grinding
FFP3 Respirator	Respiratory protection from FRP dust
Circular Saw	Primary cutting tool for straight cuts
Tungsten Drill Bits	Clean hole drilling — preferred over HSS bits

Storage & Handling

To preserve the performance of F1 FRP profiles, store on a flat and level surface in original packaging until ready to install. Use professional forklifts when loading or unloading pallets. Profiles are significantly lighter than equivalent steel sections, so on-site handling is faster and requires fewer personnel — but sharp edges on cut ends should always be handled with appropriate gloves.

> **► Tooling Note**
>
> F1 profiles can be cut, drilled and finished using conventional power tools. Tungsten-carbide drill bits and diamond-tipped saw blades give the longest tool life and cleanest cut.

Materials Safety Data

This summary provides the key health, safety and environmental information for F1 FRP pultruded profiles. For the full Safety Data Sheet for a specific product batch, contact F1 Composites.

MATERIAL IDENTIFICATION & USE

ITEM	INFORMATION
Chemical Name	Fibreglass Reinforced Polyester
Common Name	GRP · Glass Reinforced Polymer · Fibreglass
Product Identification	F1 FRP Profile
Typical Uses	Structural fabrications, handrailing, staircases, platforms, access structures, step-overs, ladders

HAZARD IDENTIFICATION

SCENARIO	HAZARD
Normal Handling	Non-hazardous under normal use; the cured product is inert.
During Cutting / Grinding	Fine particles may cause irritation to eyes, skin and respiratory tract. Always use PPE.
Explosive Hazard	Deposited dust is not self-sustaining in flame; not classified as a dust explosive.

FIRST AID MEASURES

EXPOSURE	ACTION
Skin Contact	Wash exposed skin with soap and warm water; apply moisturiser if irritation persists.
Eye Contact	Rinse with clean water for at least 10 minutes, holding eyelids apart. Seek medical attention.
Inhalation	Move affected person to fresh air. For exposure to thermal decomposition vapours, seek medical attention.
Ingestion	Do not induce vomiting. Rinse mouth with water and seek medical advice.

Maintenance & Cleaning

F1 FRP profiles are designed for low-intervention operation across 60 years of service. Periodic cleaning — tuned to local environmental conditions and pedestrian traffic — preserves both appearance and anti-slip performance. An annual inspection of mechanical fixings and adhesive joints is recommended.

General Cleaning Method

A stiff brush with warm soapy water is sufficient for most dirt and dust. For stubborn grime, standard road-traffic film cleaners diluted 10:1 with water are effective. Apply with a hard-bristled brush, leave for 10 – 15 minutes, then jet-wash off. Repeat as required.

Pressure Washing Guidance

Pressure washers up to 1,500 psi may be used. To prevent surface damage, always keep the nozzle at least 25 cm (10 in) from the surface and avoid concentrating the jet on a single spot for more than three seconds. Used this way, pressure-washing will not shorten the material's service life.

DO	DON'T
✓ Conduct an initial clean before first use.	✕ Exceed recommended cleaner concentrations.
✓ Clean regularly; increase frequency in high-traffic areas.	✕ Mix different cleaning chemicals or agents.
✓ Clean up spillages, oil and grease immediately.	✕ Use excessive water around electrical or bolted interfaces.
✓ Use stiff brushes (not mops) for best results.	✕ Use solvent-based products on the FRP surface.
✓ Follow cleaning-agent manufacturers' dilution instructions.	✕ Use synthetic scrubbing pads on textured finishes.
✓ Inspect fixings and adhesive joints annually.	✕ Use phenol-based cleaners — they degrade resin finishes.

Specific Contamination

CONTAMINATION	RECOMMENDED ACTION
General Dirt & Debris	Alkaline detergent with brush; jet-wash to remove surface debris.
Mould & Mildew	Remove at first appearance — spray with water hose then scrub with warm soapy water.
Oil / Grease / Food / Drink	Remove as soon as possible; spray with hose and scrub with warm soapy water.
Ice & Snow	Clear with plastic shovel or broom — avoid metal tools which may score the finish.
Chemical Spill	Refer to Chemical Resistance tables; dilute and rinse thoroughly.

► Annual Inspection Checklist

Annually inspect: tightness of bolted connections, condition of adhesive joints, integrity of anti-slip surfaces on stair treads and grating, and any visible fibre bloom at cut edges. Record findings and rectify any issues before they compound.

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Due to our policy of continuous improvement, specifications may change without prior notice.