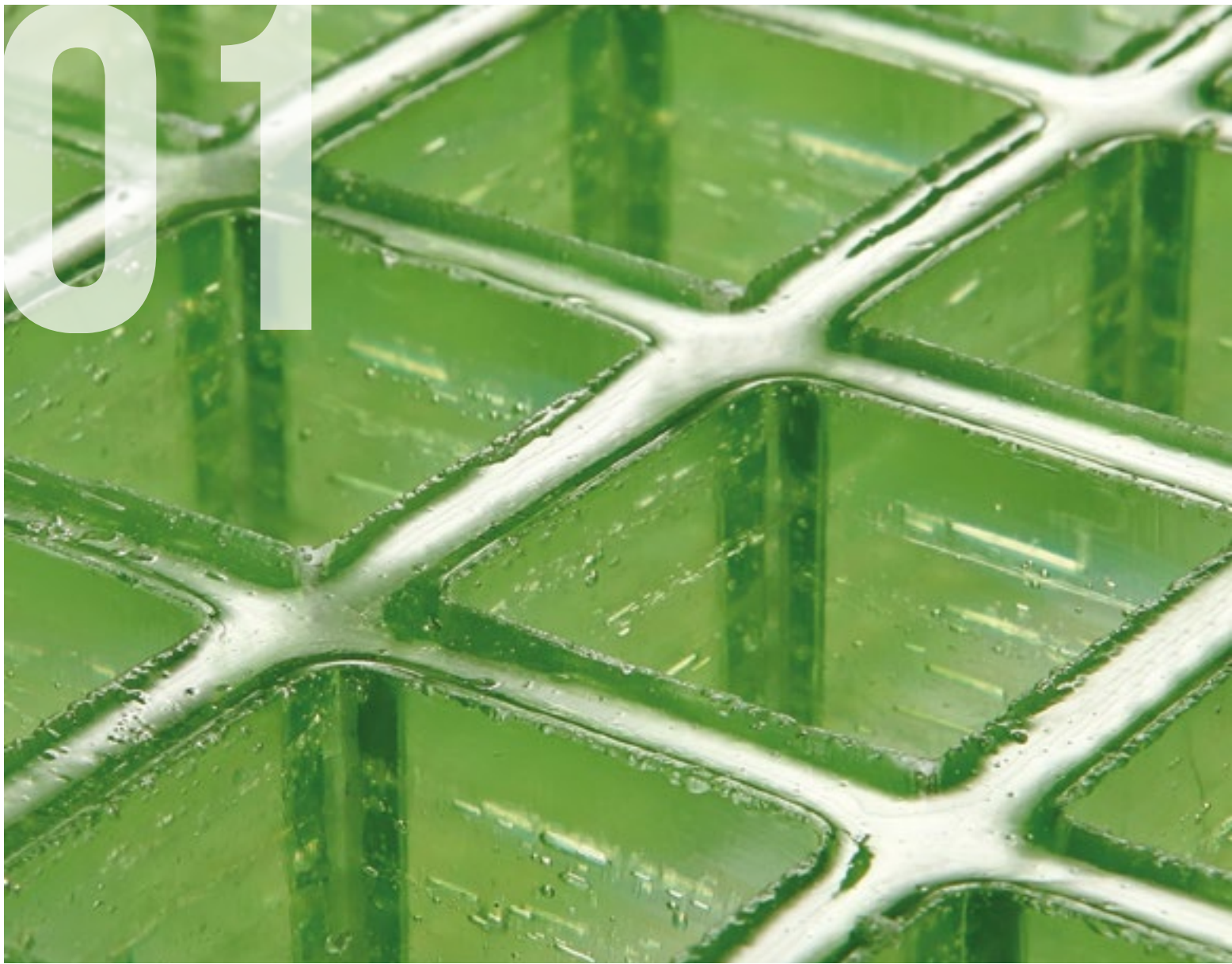


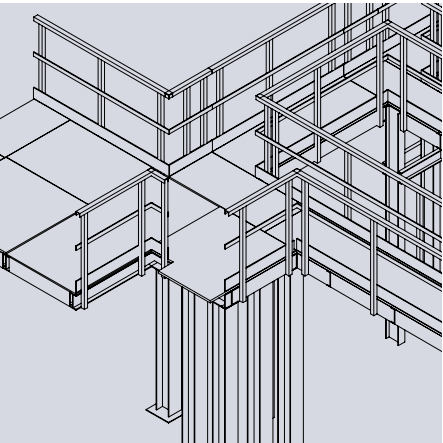
Fiberglass Reinforced Polymer
CATALOGUE





SERVICES

ENGINEERING



MECHANICAL TESTS



CHEMICAL
RESISTANCE TEST



ABOUT US



Since its inception in 1977, M.M. has been operating in the **glass fibre reinforced plastics (FRP)** industry, producing **high quality gratings and structures** (handrail systems, walkways, stairways, ladders, fences, gates, etc.). The intrinsic properties of FRP allow to create light, resistant and easy to install structures that do not require maintenance and are characterised by great versatility of use.

The company offers **customized solutions and additional services** such as technical design, structural calculation for composite materials, chemical and mechanical resistance tests, any type of cut to size, shaping and finishing.

Every phase of the company process, from design to production, from the quotation to the follow-up service, is focused on **customer satisfaction**.

HIGH QUALITY RAW MATERIALS

CUSTOMIZED SOLUTIONS

RESEARCH AND INNOVATION

CUTTING AND SHAPING



SURFACE TREATMENTS



VERIFICATION OF PRODUCT CONFORMITY



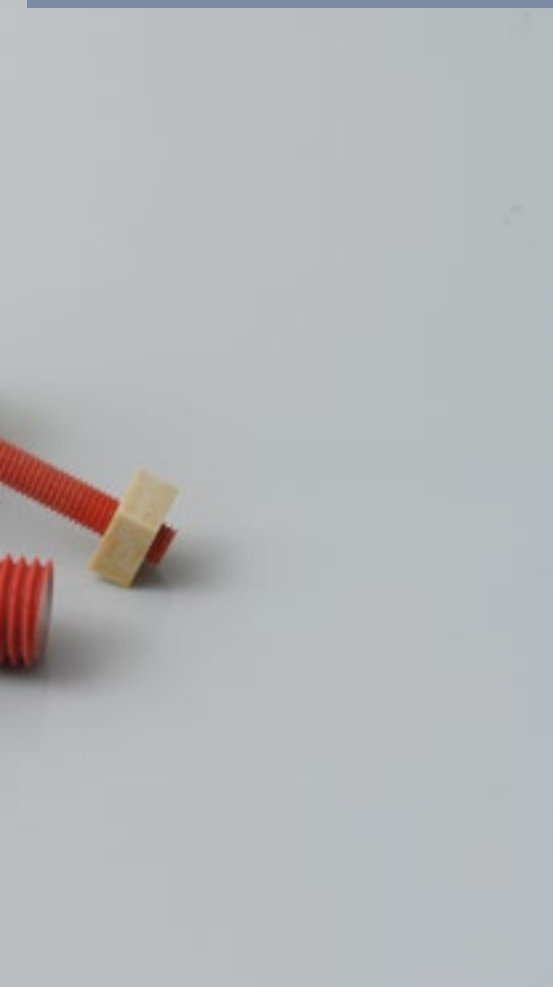


THREADED RODS

MECHANICAL RESISTANCE TABLE

TYPE	TOLERANCES	ULTIMATE TENSILE STRENGTH (N) 180°C (CLASS H)			ULTIMATE TORSION VALUE (Nm) NON LUBRICATED THREADED RODS	
		H=1A	H=1.5A	H=2A	WITH WASHERS	WITHOUT WASHERS
M8	0 / -0.20	5300	8600	11000	13	10
M10	0 / -0.25	9500	14300	20000	25	20
M12	0 / -0.30	13500	20300	30000	45	35
M14	0 / -0.30	25500	30000	42500	75	55
M16	0 / -0.30	35300	43700	55000	100	85
M18	0 / -0.30	40100	54300	68000	125	115
M20	0 / -0.30	49500	67200	80000	162	150

THREADED RODS



The threaded rods, nuts and washers, made from **glass-fibre reinforced epoxy resin**, are electrical insulators and non-magnetic.

On request they can be supplied in vinylester or in isophthalic resin.

The metric screw thread rods are available in the standard length of 2,200 mm and can also be supplied cut to size.

FRP fixing systems are the ideal solution for the many applications where dielectricity and high corrosion resistance are required.

DIELECTRIC

RESISTANT TO CORROSION

HIGH AXIAL RESISTANCE

Ø	STANDARD LENGTH
M5*	2.200 mm
M6	2.200 mm
M8	2.200 mm
M10	2.200 mm
M12	2.200 mm
M14	2.200 mm
M15	2.200 mm
M18	2.200 mm
M20	2.200 mm
M22*	2.200 mm
M24*	2.200 mm

**items not in stock and available on request*

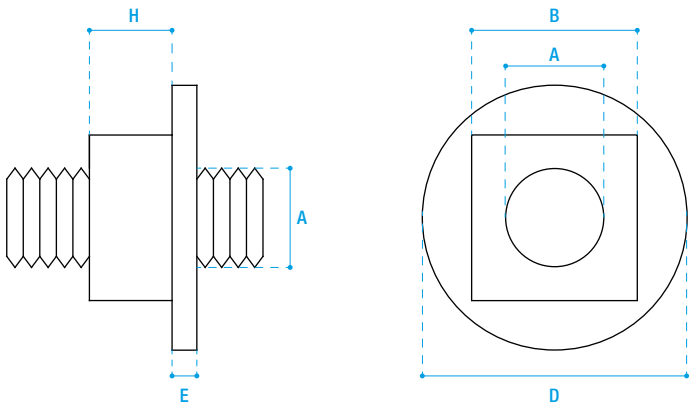


NUTS

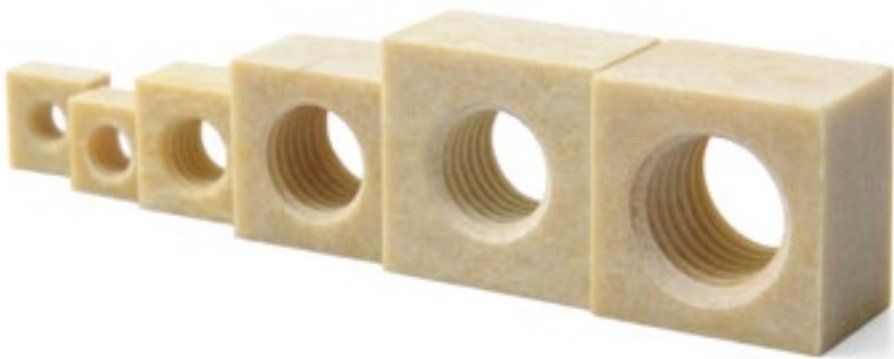
SQUARE SIZE 1 X Ø

Ø	SIZE BxBxH
M5*	10x10x5 mm
M6	17x17x6 mm
M8	17x17x8 mm
M10	19x19x10 mm
M12	22x22x12 mm
M14	24x24x14 mm
M16	27x27x16 mm
M18	30x30x16 mm
M20	32x32x20 mm
M22*	36x36x22 mm
M24*	41x41x24 mm

*items not in stock and available on request



A = rod Ø / threaded rod
B = nut side (spanner)
D = washer diameter
E = washer thickness
H = nut height



WASHERS

TYPE*	D	E
RM6	10,5 mm	2,5 mm
RM8	18,5 mm	2,5 mm
RM10	22 mm	2,5 mm
RM12	26 mm	2,5 mm
RM14	30 mm	2,5 mm
RM16	31 mm	3,0 mm
RM18	48 mm	5 mm
RM20	51 mm	5 mm

*other types of washers available on request



THREADED RODS - NUTS - WASHERS

TECHNICAL CHARACTERISTICS		STANDARDS	MEASURE UNIT	VALUE
MECHANICAL PROPERTIES	Flexural strength at rupture perpendicular to laminations	ISO 178	MPa	450
	Apparent modulus of bending elasticity	ISO 178	MPa	26000
	Compression strength perpendicular to lamination	ISO 604	MPa	400
	Impact strength (IZOD) parallel to lamination	ISO 108	kJ/m ²	50
	Tensile strength	ISO 527	MPa	450
	Delamination resistance	CEI	N	8000
	Compression strength	ISO 604	MPa	-
	Cohesion between layers	EN61212-2	Mpa	-
DIELECTRIC PROPERTIES	Electrical stiffness at 90°C perpendicular to stratifications (thickness 3 mm)	IEC 243-1	kV/mm	15
	Penetration voltage, at 90°C parallel to laminations	IEC 243-1	kV	60
	Permittivity at 48-68 Hz	IEC 250	-	5,5
	Dissipation factor at 48-62 Hz	IEC 251	-	0,04
	Comparative tracking index	IEC 112	CIT	>600
	Dry arc resistance	ASTM D 495	sec.	>180
FIRE RESISTANCE	Ignition time	ASTM D 229	sec.	200
	Flame-out time	ASTM 229	sec.	60
	Flammability	UL 94	class	V0
	Specific smokes optical density	ASTM E 662	-	in conformity
	Determination of gas combustion, toxicity index	CEI 20.37/7	-	in conformity
THERMAL PROPERTIES	Thermal conductivity	ISO 8302	W/mK	0,3
	Linear expansion coefficient	VDE 0304/2	10 ⁻⁶ K ⁻¹	10-20
CHEMICAL PROPERTIES	Density	ISO 1183	g/cm ³	1,9-2,0
	Water absorption (thickness 3 mm)	ISO 62	mg	22



Graphic project
Interlaced srl

M.M. S.R.L.

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