



MIN
ITALY

M124-5 D400





/MANHOLE cover
in Fiberglass Reinforced Polymers (FRP)

company

M.M. is a company with more than **40 years of experience** in designing and producing goods made of **Fiberglass Reinforced Polymers (FRP)**. Our company is specialized in gratings and structures (handrails, gangways, ladders, stairways, fences, gates and other customized solutions).

Experience, innovation, professionalism and understanding customers' needs: this is what makes **M.M. the best partner for the most various FRP projects.**

Through its dedication to research and development, the company is constantly looking for new solutions and products.



production process

As per EN 124:2015, the production process of our manholes covers falls under class C3 ("Composite material C3" Point 4.2 Type of composite materials).

This is a compression molding process made with a closed mold under controlled temperature (SMC) that employs thermosetting resins (polyester resin), glass fibers and other additives.

The production process guarantees excellent fibers' wettability from the polymer matrix. Moreover, it avoids air bubbles and creates an excellent interlaminar cohesion between components.

certification

Design requirements, type testing, markings, quality checks according to EN 124:2015. Certification issued by ICMQ.



areas of use

Our FRP manholes covers are designed to meet A15/B125/C250/D400 load ratings' requirements in accordance with EN 124:2015. Moreover, FRP covers have hardness characteristics similar to cast iron ones, while having **better resistance to residual strains**.



MINIMAL RESISTANCE LOAD
> 15 kN

Exclusively pedestrian and cycling areas.



MINIMAL RESISTANCE LOAD
> 125 kN

Sidewalks, pedestrian or similar areas, rest areas and car parking garage.



MINIMAL RESISTANCE LOAD
> 250 kN

Areas of drainage channels along the sidewalks that run for a maximum of 0,5m onto the roadway and for a maximum of 0,2m onto the sidewalk.



MINIMAL RESISTANCE LOAD
> 400 kN

Roadways (including pedestrian ways), transitable platforms and rest areas for road vehicles of all kinds.



advantages



Lightness

The composite manhole covers are up to 50% lighter than the ones in cast iron. Their lightness ensures an **easier handling** during the installation phase as well as during the maintenance, **providing significant time, workforce and means savings**. The installation could be indeed safely carried out by a single worker. Moreover, the reduced weight **cuts down substantially the transport costs**.



Permeability to electromagnetic waves

Composite manhole covers have a minimum radio frequency interference. This band of frequencies is used in the modern data transmission systems (such as meters, flowmeters, antennas), frequently installed inside underground wells. A specialized laboratory measured a range of frequencies from 800 MHz to 6 GHz according to MIL-STD-285 standards. Its tests confirmed that the signal reduction caused by composite covers is very low.



UV resistance



Thermal resistance

M.M.'s covers are perfectly suitable to extreme weather conditions since they resist to a range of temperature from -40°C up to 100°C.



No deformations

Since the elongation in spheroidal cast iron can reach up to 18%, deformation issues may arise during inspection and maintenance.



Corrosion resistance

Composite covers are not affected by corrosion or by chemicals since the surface is entirely made of a chemical resistant thermosetting resin.



Scratch-resistant finish

Special scratch-resistant knurled finish

maximal security



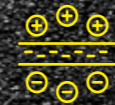
Antislippery

The upper surface of cover has relief designs realized according to EN 124 that guarantee the safety standards even in case of bad weather due to the anti-slip characteristics.



Thermal insulator

If placed in contact with a heat source, the FRP cover takes much longer time to warm up than an iron cast cover.



Electrical insulator

The composite manhole cover is non-conductive, so it protects pedestrian from possible electric leakages, especially in humid or wet environments.



Personalization

Upon request we can customize the cover with logos and patterns. The design resolution is better than manhole covers made of different materials, such as iron casts.

FRP manhole cover allows innovative design and is available in various colors as well.

Metal elements may be added to the cover in order to make them easy to find in case of snow.



Respect for the environment

The production process requires lower energy consumption than iron cast covers. The material, the technology and the lean production process allow, in fact, to lower carbon dioxide emission.

FRP manhole cover may be recycled through a mechanical process and reuse for by-products.



Noise reduction

Composite covers considerably reduce the noises caused by imperfect match between lid and frame or installation mistakes. Due to this, the passage of vehicles or people may produce noise issues. Iron cast covers are often subject to this problem indeed.



Theft prevention

In the last years metal manhole covers have been stolen regularly, both in Italy and abroad. This phenomenon entails huge replacement costs, taking into consideration the new supply and the installation.

Moreover, these thefts are very dangerous for the safety of people and vehicle passing over or near them.

FRP manhole covers have no monetary value, while iron cast ones may be sold to scrap metal dealers. Therefore, composite covers prevent not only the possible accidents caused by cover thefts, but their replacement costs.

fields of application

Water service

Systems of water collection have many issues resulting from hydrogen sulfide (H₂S) and its characteristic **odor**.

Sewer gases cannot corrode FRP manhole covers that are as well designed to retain odors through seals.

FRP's permeability to electromagnetic waves allow the use of **RFID (Radio-Frequency Identification)** technology. The RFID tags automatically store and collect information that may concern the cover and its maintenance or other data that are transmitted via satellites systems or IoT technologies.

Since thieves have no interest in stealing composite covers, the risk for pedestrians and vehicles is lower as well as the systems maintenance costs.



District heating networks

FRP's heat resistance guarantees the security even if hot steam leakage in the heating networks occurs.

Energy and transportation

FRP manhole cover does not conduct electricity. Therefore, it is especially **useful in high-voltage areas** to ensure operators' and users' security.

Compared to the other ones, FRP covers' lightness make **the installation easier in the areas of difficult access**. Moreover, they simplify inspection operations since they need less manpower.





Oil & Gas

Composite manhole cover does not generate electric sparks or condensation. These characteristics make it particularly suitable for fuel distribution plants (i.e. petrol stations or fuel storages).

Being antistatic and sealant, **the petrol station cover** guarantees security and contamination protection. Moreover, the double cover/central cap make the refueling easier.



Civil construction

FRP manhole covers may be used in both urban and non-urban environments. Being **very resistant** to marine environment, they are the best solution for seaside towns.



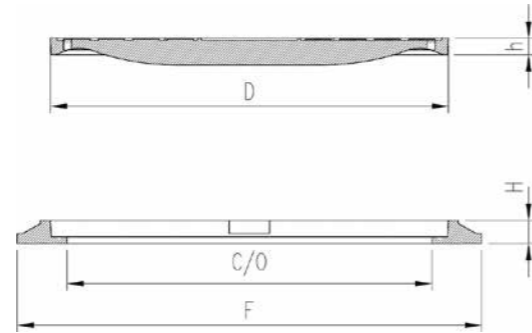
Telecommunications

Thanks to FRP's permeability to electromagnetic waves, the signal may pass through **underground antennas**.

Moreover, the telecommunications workers may speed up their routine maintenance operations by **tracing the networks through RFID tags**, avoiding inconveniences and useless waste of time.



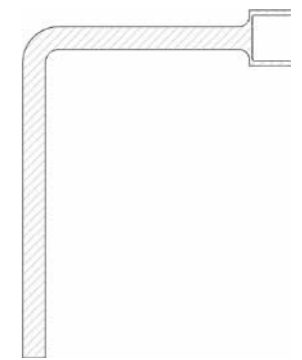
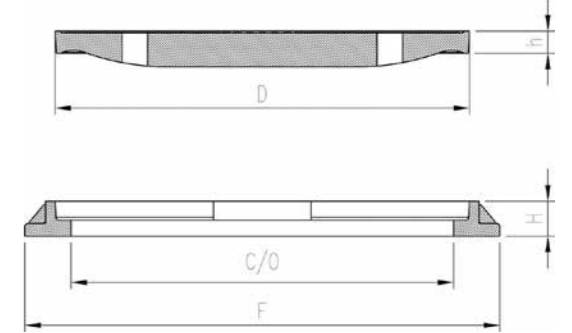
round



LIFTING KEY TYPE 2

CLASS	MODELL	FRAME			WEIGHT	COVER			SEALING	FIXING	LIFTING
		C/O	F	H		D	h	WEIGHT			
kN 125	B125T/500_001	550 mm	700 mm	35 mm	2,8 kg	600 mm	25 mm	13,8 kg	no	2 screws	-
	B125T/600_001	600 mm	780 mm	40 mm	4,2 kg	650 mm	26 mm	14,9 kg	yes	2 screws	-
	C250T/600_001	600 mm	760 mm	60 mm	8,6 kg	650 mm	40 mm	25,6 kg	yes	1 screw	-
kN 250	C250T/840_001	800 mm	1065 mm	113 mm	19,8 kg	840 mm	70 mm	55,0 kg	yes	-	2 eye screws 2 washers 2 hexagonal nuts
kN 400	D400T/600_001	600 mm	785 mm	100 mm	14,1 kg	650 mm	40 mm	31,8 kg	yes	1 screw	-

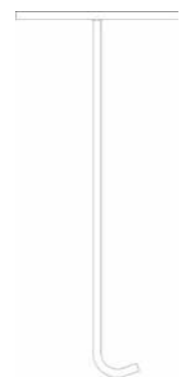
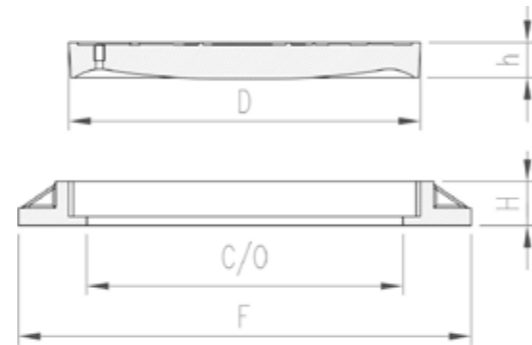
round with hinge



LIFTING KEY TYPE 3

CLASS	MODELL	FRAME			WEIGHT	COVER			SEALING	FIXING	LIFTING
		C/O	F	H		D	h	WEIGHT			
kN 125	B125TC/600_001	600 mm	745 mm	55 mm	8,4 kg	650 mm	35 mm	18,2 kg	-	Hinge 120° + lock	-
kN 250	C250TC/700_001	700 mm	910 mm	75 mm	16,3 kg	750 mm	50 mm	37,2 kg	yes	Hinge 180° + lock	-
kN 400	D400TC/600_001	600 mm	805 mm	100 mm	17,0 kg	690 mm	50 mm	36,0 kg	yes	Hinge 180° + lock	-
	D400TC/600_002	600 mm	790 mm	100 mm	13,4 kg	650 mm	48 mm	31,6 kg	yes	Hinge 120° + lock	-
	D400TC/700_001	700 mm	910 mm	100 mm	20,5 kg	750 mm	50 mm	45,5 kg	yes	Hinge 180° + lock	-

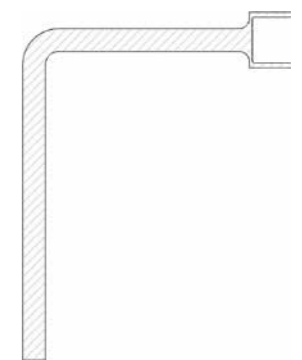
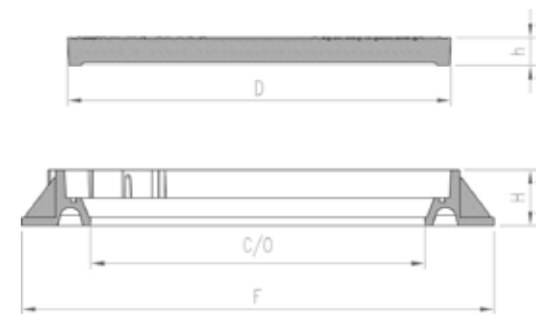
square



LIFTING KEY TYPE 2

CLASS	MODELL	FRAME			WEIGHT	D	h	WEIGHT	COVER		LIFTING
		C/O	F	H					SEALING	FIXING	
kN 125	B125Q/360_001	360x360 mm	515x515 mm	60 mm	7,1 kg	400x400mm	40 mm	8,2 kg	-	-	1 eye screw, 1 washer, 1 hexagonal nut
	B125Q/450_001	465x465 mm	591x591 mm	35 mm	2,5 kg	500x500 mm	25 mm	12,7 kg	-	2 screws	2 eye screws, 2 washers, 2 hexagonal nuts
	B125Q/550_001	560x560 mm	673x673 mm	35 mm	3,4 kg	600x600 mm	25 mm	18,0 kg	-	4 screws	2 eye screws, 2 washers, 2 hexagonal nuts
	B125Q/600_001	600x600 mm	750x750 mm	35 mm	3,8 kg	650x650 mm	25 mm	22,2 kg	-	4 screws	2 eye screws, 2 washers, 2 hexagonal nuts
	B125Q/900_001	900x900 mm	1035x1035 mm	70 mm	26,1 kg	1000x1000 mm	40 mm	55,0 kg	-	4 screws	2 eye screws, 2 washers, 2 hexagonal nuts
kN 400	D400Q/550_001	550x550 mm	705x705 mm	100 mm	19,0 kg	600x600 mm	50 mm	34,0 kg	yes	-	2 eye screws, 2 washers, 2 hexagonal nuts
	D400Q/600_001	600x600 mm	770x770 mm	100 mm	24,0 kg	655x655 mm	50 mm	47,0 kg	yes	4 screws	2 eye screws, 2 washers, 2 hexagonal nuts

round-square



LIFTING KEY TYPE 3

CLASS	MODELL	FRAME			WEIGHT	D	h	WEIGHT	COVER		LIFTING
		C/O	F	H					SEALING	FIXING	
kN 400	D400QT/600_001	600 mm	850x850 mm	100 mm	20,4 kg	690 mm	50 mm	40,0 kg	yes	Hinge 180° + lock	-

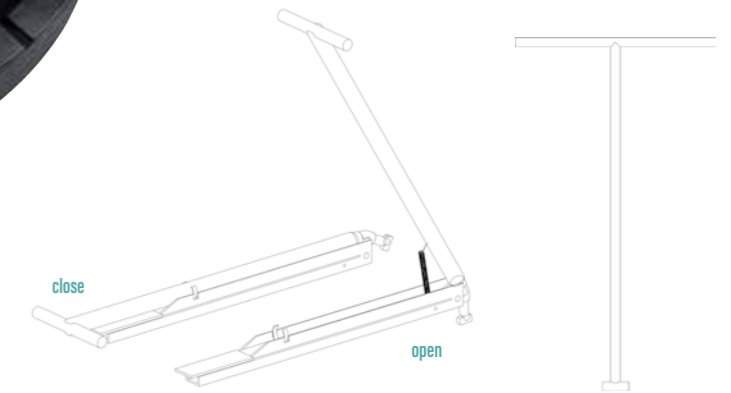
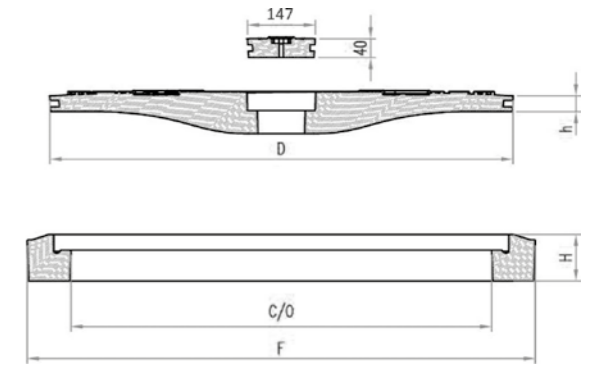
rectangular



LIFTING KEY TYPE 2

CLASS	MODELL	FRAME				COVER		WEIGHT	SEALING	FIXING	LIFTING
		C/O	F	H	WEIGHT	D	h				
kN 400	D400R_001	600x900 mm	1070x760 mm	100 mm	27,2 kg	650x950 mm	65 mm	63,0 kg	yes	4 screws	-

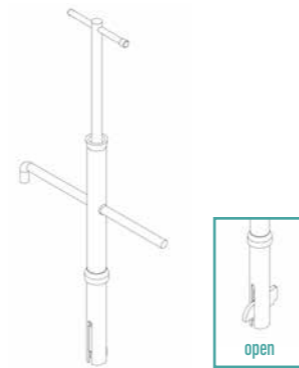
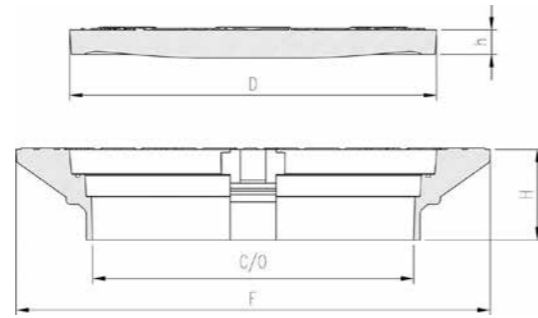
petrol station



LIFTING KEY TYPE 6 + TYPE 4

CLASS	MODELL	FRAME				COVER		WEIGHT	SEALING	FIXING	LIFTING
		C/O	F	H	WEIGHT	D	h				
kN 400	D400T/900_001	900 mm	1083 mm	100 mm	23,0 kg	987 mm	35 mm	73,0 kg	yes + cap	-	1 eye screw, 1 washer 1 exagonal nut

floating



LIFTING KEY TYPE 1

CLASS	MODELL	C/O	FRAME			D	h	WEIGHT	COVER		
			F	H	WEIGHT				SEALING	FIXING	LIFTING
kn 400	D400FL/600_001	630 mm	930 mm	180 mm	55,7 kg	720 mm	54 mm	49,1 kg	yes	hinge 180° + lock	-





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