

THERMO**DRAIN**[®]



**EASY TO HOLD
TOUGH TO BEAT**

www.frpmanholecover.com

ISO 9001 : 2015 Company

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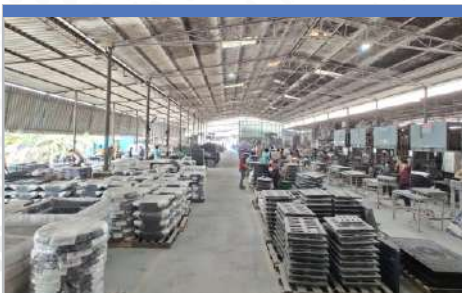
About Us

THERMOSET POLY PRODUCTS (I) PVT. LTD.(ISO 9001 : 2015) is a Design and Manufacturing Company located in Navi Mumbai, Maharashtra, India. The company was established in 1993 with industrial equipments being Manufactured for the corrosive industry in India and abroad. Backed with a strong design, R&D and technical team, we have successfully developed products like windmill nacelle covers in FRP for the wind power industry.

We have developed MECHWOOD - man made artificial wood with zero wooden ingredients (yet to be launched) and FRP/GRP/Composite THERMODRAIN solid top manhole covers, Recess manhole covers, air & water tight covers, multiple covers, water gully covers, water tank covers, gratings, L Angles, drain channels and chambers for the sewerage, electrical, telecom and cable chambers. With a strong technical team and in-house testing facility, we have been engaged in developing new products at regular intervals. Our R&D department has enabled us to develop technically superior and cost effective products. Our consistent and technically superior products have enabled us to export and establish our products in different countries. Our team strength of 250 people includes a well spread marketing team in India and abroad.

Our Manufacturing facility of 40,000 sq. ft. is spread over a factory area of 1,60,000 sq. ft. With an intent to manufacture quality products on consistent basis we have been stringently testing our products under third party agencies as per relevant testing standards like BS EN 124, IS 1726, BS 4994 and AASHTO.

Factory Pictures



PRODUCT LIST

- SOLID TOP MANHOLE COVERS WITH FRAME
- MULTIPLE COVERS WITH FRAME
- RECESS MANHOLE COVERS WITH FRAME
- AIR & WATER TIGHT COVERS WITH FRAME
- GRATINGS
- L ANGLE
- WATER GULLY COVERS WITH FRAME
- HINGED OVERHEAD AND U.G. WATER TANK COVERS WITH FRAME
- CHAMBERS
- DRAIN CHANNELS WITH GRATING / GULLY COVER

Inhouse CNC Machining Shop



ISO Certificate



Properties Of FRP / GRP / Composite

- FRP as a material is resistant to sunlight, water, chemical water, sewerage water.
- UV stabilizer is added to the raw material to impart UV resistance.
- FRP has high impact resistance as it is flexible and not brittle. Hence, in case of excess load bearing, the FRP covers/gratings do not disintegrate into pieces like Cast Iron or Ductile Iron.
- The strength to weight ratio in FRP is much higher than other materials. Hence, the strength is higher even with lesser weight of FRP.
- During manufacturing, FRP cures at a self exothermic temperature of 175°C.
- FRP is a thermoset material (non reversible and cannot be melted) and not a thermo plastic (reversible and can be melted). Hence, the non reprocessability protects it from theft and extreme sunlight does not soften the material.
- FRP is a suitable material under extreme hot and cold conditions.
- FRP can be destroyed by burning in incinerator.

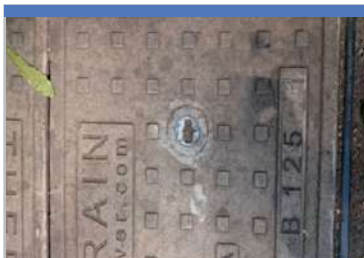
Features Of THERMODRAIN FRP / GRP / COMPOSITE Manhole Covers

- Due to non presence of metal or any other reprocessable material in the cover, our covers are not prone to theft.
- Top 7mm surface is a high abrasion surface.
- All THERMODRAIN covers are available with **double seal** arrangement.
- **The lifting area i.e., the rod type lifting or key hole type (High Strength Plastic Alloy / Stainless Steel - socket type) is closed from the bottom. Hence, it does not allow mosquito breeding in the chambers.**

- THERMODRAIN FRP Manhole Covers are available in standard granite finish and are also available in any other colour specified by client.
- All THERMODRAIN Covers are self pigmented and hence, does not require painting. However, if wanted they can be painted.
- All THERMODRAIN products are UV stabilized and hence, there is no effect of sunlight.
- Due to poor heat transfer properties of FRP, FRP Covers do not absorb heat and remains at normal temperature under sunlight. Hence, it is convenient to handle THERMODRAIN FRP Manhole Covers under extreme hot conditions.
- As the FRP Manhole Covers are flexible and do not disintegrate into pieces due to excess load bearing imparted on the cover, accidents on roads are avoided as the chambers are not left open even in case of cracking of cover.

Special Features

- All lifting keyholes are bottom closed. This does not allow foul smell to emanate from the Chamber & does not allow foreign particles to enter the Chamber.
- All Manhole Covers are **double seal type**.
- All lifting key holes have **High Strength Plastic Alloy / Stainless Steel** sockets. This does not allow the FRP to get damaged around the key holes due to multiple lifting operations. Please find attached picture of the key hole showing the condition of the keyhole area without insert & condition of "THERMODRAIN" keyhole area with insert.



Condition of the socket type keyhole lifting arrangement of THERMODRAIN FRP manhole covers



Condition of the Regular keyhole lifting arrangement of other make FRP manhole covers

LOAD TESTING

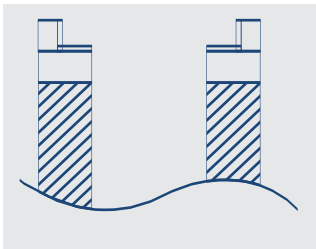
THERMODRAIN FRP/GRP/COMPOSITE products are tested for 2.5 tons, 5 tons, B125 (12.5 tons), C250 (25 tons), D400 (40 tons) and E600 (60 tons) class load bearing and permanent set as per BS EN 124, IS 1726 and AASHTO. BS EN 124 is a testing code worldwide for Manhole Covers in cast iron, ductile iron and other Materials also. Permanent Set is a multiple loading test to determine the permanent deformation in cover after multiple loading within a short time as specified in the code.



DO'S & DON'TS

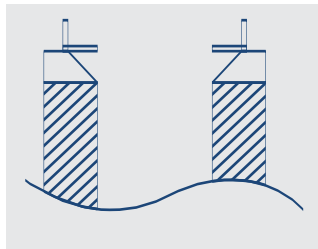
Installation

Do's



Correct installation of frame with complete civil support

Don'ts



Load on the frame to be applied only after grouting is completed

Handling

Do's



Handle with care

Don'ts



Do not throw the material

APPLICABLE LOAD BEARING

GROUP	CLASS	LOAD	INSTALLATION AREAS	EXAMPLE
	F900	90 Ton (900kN)	Areas imposing high wheel loads	Airports
	E600	60 Ton (600kN)	Areas imposing high wheel loads	Sea ports
	D400	40 Ton (400kN)	Carriageway of roads (including pedestrian ways) and parking areas for all types of road vehicles	Roadways and vehicle traffic

GROUP	CLASS	LOAD	INSTALLATION AREAS	EXAMPLE
	C250	25 Ton (250kN)	Kerbside channels of roads	Kerbside parking areas
	B125	12,5 Ton (125kN)	Footways, pedestrian areas and areas with light duty.	Parking areas for cars only
	A15	1,5 Ton (15kN)	Areas which can only be used by pedestrian and pedal cyclists	Bicycle ways, pedestrian ways

Solid Top Manhole Covers - Sizes

THERMODRAIN FRP/GRP/COMPOSITE SOLID TOP MANHOLE COVERS WITH FRAME	
Sr. No.	FRAME OPENING SIZE
	CIRCULAR
1	400 mm (16")
2	450mm (17")
3	500 mm (20")
4	600 mm (24")
5	690 mm (27")
6	762 mm (30")
7	900 mm (36")
8	1000 mm (40")
9	1400 mm (55") (2 covers with single frame)
	RECTANGULAR
10	600 mm x 450 mm (24"x18")
11	900 mm x 450 mm (36"x18")
12	900 mm x 600 mm (36"x 24")
13	990 mm x 1220 mm (40"x 49")
	SQUARE
14	300 mm x 300 mm (12"x12")
15	450 mm x 450 mm (18"x18")
16	600 mm x 600 mm (24"x 24")
17	675 mm x 675 mm (27"x 27")
18	750 mm x 750 mm (29"x 29")
19	900 mm x 900 mm (36"x 36")
20	900 mm x 900 mm (36"x 36") (2 covers with single frame)
21	1000 mm x 1000 mm (40"x 40")
22	1200 mm x 1200 mm (48"x 48")
23	1500 mm x 1500 mm (60"x 60")

COMPARATIVE CHART

THERMODRAIN FRP / GRP / Composite Manhole Covers **V/S** Cast Iron / Ductile Iron Manhole Covers

THERMODRAIN FRP/GRP/ COMPOSITE MANHOLE COVERS



High Strength To Weight Ratio
No Scrap Value Hence No Theft
Light Weight - Easy To Handle
Material Has High Impact Resistance Hence Doesn't Crack On Impact
Corrosion Resistant, No Effect of Sea / Sewage Water
High Aesthetic Value, Available In Granite Finish Or Any Desired Color
Self Pigmented. No Painting Required
Less Freight & Handling Cost, Due to Less Weight
No Extra GRP Plate is Required To Protect From Corrosion

CAST IRON / DUCTILE IRON MANHOLE COVERS



Low Strength To Weight Ratio
High Risk of Theft
Heavy - Needs More Manpower
Material is Brittle Hence Easily Cracks on Impact
Gets Corroded By Sewage & Sea Water
Standard Appearance
Painting Required at Regular Intervals
Higher Freight and Handling Cost, Due To More Weight
Extra GRP Plate is Required Below the Cover To Protect From Corrosion

COMPARATIVE CHART

THERMODRAIN FRP / GRP / Composite Manhole Covers V/S Concrete Manhole Covers

THERMODRAIN FRP/GRP/ COMPOSITE MANHOLE COVERS



No Steel Content, No Resale Value, Hence No Theft

High Strength To Weight Ratio

Long Life (20-30 Years)

Light Weight - Easy To Handle

Excellent Abrasion Resistance

No Erosion Due To Rain Water And Moving Vehicles

No Effect Of Sewage Water & Chemical Water

No Environmental Degradation

CONCRETE MANHOLE COVERS



Theft Happens Due To Presence Of Steel Internally

Low Strength To Weight Ratio

Short Life (2-3 Years)

Heavy - Needs More Manpower

Poor Abrasion Resistance

Gets Eroded Due To Rain Water And Moving Vehicles

Poor Resistance To Sewage Water & Chemical Water

High Environmental Degradation

FRP / GRP / Composite Solid Top Manhole Covers

With a better performance than Cast Iron, Ductile Iron and RCC manhole covers, this product is an industrial revolution. They have been thoroughly tested as per BS EN 124, IS 1726 & AASHTO M306 standards for drainage and utility services. THERMODRAIN manhole covers meet all the requirements of the code.

Our covers are available in all standard sizes with load bearing capacity ranging from 2.5 tons to 60 tons (E 600). They come in circular, square and rectangular shapes available with double seal arrangements.

Salient Features

- All covers are available with double seal.
- All covers can be provided with key locking or bolt locking arrangement.
- All lifting keyholes are in High Strength Plastic Alloy / Stainless Steel, socket type to avoid wear & tear in the lifting area.
- All keyholes have closed bottoms (not thru & thru).
- If required the covers are made available with bolt locking arrangement.
- Permanent set is zero in all sizes & load bearing.
- Self pigmented/non painted.
- Non brittle



FRP / GRP / Composite Multiple Covers With Frame

With a better performance than Cast Iron, Ductile Iron and RCC manhole covers, this product is an industrial revolution. They have been thoroughly tested as per BS EN 124, IS 1726 & AASHTO M306 standards for drainage and utility services. THERMODRAIN Multiple Manhole Covers are an ideal solution to odd size chambers. The entire product with FRP / M. S frame is designed and manufactured to the existing chamber size.

Our covers are available with load bearing capacity ranging from 2.5 tons to 60 tons (E 600).

Salient Features

- All lifting keyholes are in High Strength Plastic Alloy / Stainless Steel, socket type to avoid wear & tear in the lifting area.
- All keyholes have closed bottoms (not thru & thru).
- If required the covers are made available with bolt locking arrangement.
- Permanent set is zero in all sizes & load bearing.
- Self pigmented/non painted.
- Non brittle



Recess Manhole Covers - Sizes

THERMODRAIN FRP/GRP/COMPOSITE RECESS COVERS WITH FRAME	
Sr. No.	FRAME OPENING SIZE
CIRCULAR	
1	500 mm (20")
2	600 mm (24")
3	690 mm (27")
4	762 mm (30")
5	900 mm (36")
6	1000 mm (40")
RECTANGULAR	
7	600 mm x 450 mm (24"x18")
8	900 mm x 450 mm (36"x18")
9	900 mm x 600 mm (36"x 24")
10	990 mm x 1220 mm (40"x 49")
SQUARE	
11	300 mm x 300 mm (12"x12")
12	450 mm x 450 mm (18"x18")
13	600 mm x 600 mm (24"x 24")
14	750 mm x 750 mm (29"x 29")
15	900 mm x 900 mm (36"x 36")
16	1000 mm x 1000 mm (40"x 40")
17	1200 mm x 1200 mm (48"x 48")

Recess Manhole Covers

With a better performance than Cast Iron, Ductile Iron and RCC manhole covers THERMODRAIN Recess Covers are lighter and superior to the conventional materials. They have been thoroughly tested for load bearing and permanent set as per BSEN 124, IS 1726 & AASHTO M306 standards for drainage and utility services. Our covers meet all the requirement of the code. A 65 mm Recess height is provided for fixing of cement, blocks, or tiles.

Our covers are available in all standard sizes with load bearing capacity ranging from 2.5 tons to 60 tons(E 600). They come in circular, square and rectangular shapes available with single and **double seal** arrangements.

Salient Features

- All covers are available with double seal.
- Non Brittle
- All lifting keyholes are in M. S Epoxy painted / Stainless Steel, Socket type to avoid wear and tear in lifting area.
- Self Pigmented / Non-Painted.
- Permanent set is zero in all sizes & load bearing.
- All Keyholes have closed bottoms. (Not thru & thru)



Air & Water Tight Covers - Sizes

THERMODRAIN FRP/GRP/COMPOSITE AIR & WATER TIGHT COVERS WITH FRAME	
Sr. No.	FRAME OPENING SIZE
	CIRCULAR
1	400 mm (16")
2	450mm (17")
3	500 mm (20")
4	600 mm (24")
5	690 mm (27")
6	762 mm (30")
7	900 mm (36")
8	1000 mm (40")
	RECTANGULAR
9	600 mm x 450 mm (24"x18")
10	900 mm x 450 mm (36"x18")
11	900 mm x 600 mm (36"x 24")
12	990 mm x 1220 mm (40"x 49")
	SQUARE
13	300 mm x 300 mm (12"x12")
14	450 mm x 450 mm (18"x18")
15	600 mm x 600 mm (24"x 24")
16	675 mm x 675 mm (27"x 27")
17	750 mm x 750 mm (29"x 29")
18	900 mm x 900 mm (36"x 36")
19	1000 mm x 1000 mm (40"x 40")
20	1200 mm x 1200 mm (48"x 48")
21	1500 mm x 1500 mm (60"x 60")

Air & Water Tight Covers

With a better performance than Cast Iron, Ductile Iron and RCC manhole covers, this product is an industrial revolution. They have been thoroughly tested as per BS EN 124, IS 1726 & AASHTO M306 standards for drainage and utility services. THERMODRAIN Air and Water Tight Covers meet all the requirements of the code.

Our covers are available in all standard sizes with load bearing capacity ranging from 2.5 tons to 60 tons(E 600). They come in circular, square and rectangular shapes available with single and double seal arrangements.

Salient Features

- Air & Water Tight covers are available with locking and gasket arrangement.
- The gasket can be replaced locally in the long run in case of damage.
- WATER AND AIR TIGHT, hence no foul smell and water seepage.



Gratings

Salient Features

"THERMODRAIN" Gratings are with ZERO FILLER CONTENT due to which it doesn't have air voids, hence doesn't require void filling & painting / coating.

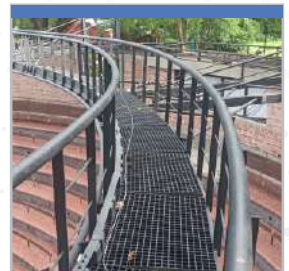
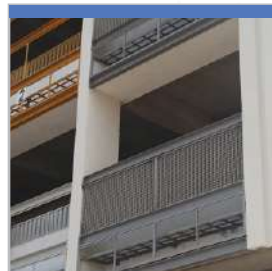
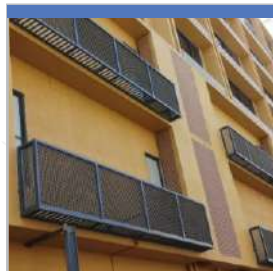
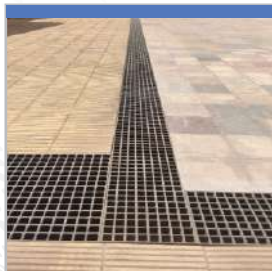
Due to Zero filler "THERMODRAIN" Gratings perform far superior under load bearing and weathering. They do not crack under open sunlight and have higher impact resistance than FRP Gratings with filler contents. Its high flexural strength doesn't allow permanent deformation due to load.

"THERMODRAIN" Gratings are self pigmented, non painted.

"THERMODRAIN" Gratings are one piece molded jointless (Interwoven Construction).

Areas Of Applications

- Swimming Pool
- Industrial Plants
- Podiums
- Basement Car Park
- Storm Water Drain Trenches
- Cable Trenches



Tree Gratings

Salient Features

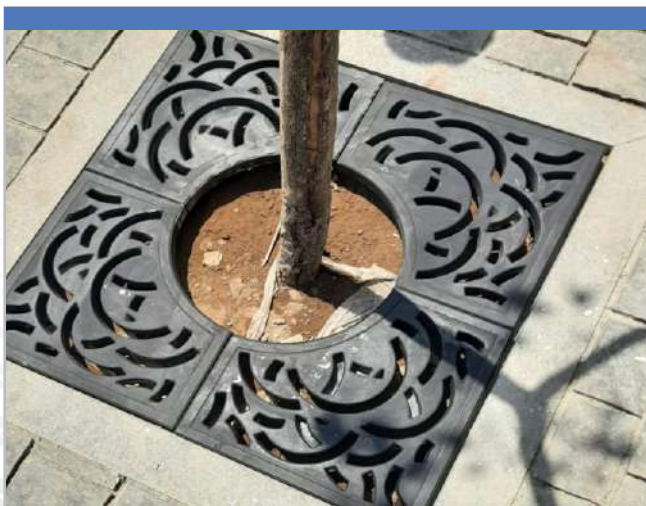
"THERMODRAIN" Tree Gratings are self pigmented, non painted.

"THERMODRAIN" Tree Gratings are available in two piece or four piece for ease of installation.

"THERMODRAIN" Tree Gratings protect the soil and allow pedestrians to walk near the tree without compacting the soil.

"THERMODRAIN" Tree Gratings allow the rain water to penetrate the soil.

"THERMODRAIN" Tree Gratings improve the landscaping and aesthetics of the surrounding with it's artistic design.



COMPARATIVE CHART

THERMODRAIN FRP / GRP Gratings **V/S** Mild Steel Gratings

THERMODRAIN FRP/GRP GRATINGS



High Strength To Weight Ratio
No Scrap Value Hence No Theft
Light Weight - Easy To Handle
Material Has High Impact Resistance Hence Doesn't Permanently Bend Due To Moving Vehicles
Corrosion Resistant, No Effect of Sea / Sewage Water
No Algae Formation
High Aesthetic Value, Available In Dark Grey or Any Desired Color
Self Pigmented. No Painting Required
Less Freight & Handling Cost, Due to Less Weight
No Maintenance Required

MILD STEEL GRATINGS



Low Strength To Weight Ratio
High Risk of Theft
Heavy - Needs More Manpower
Material Permanently Bends Due To Moving Vehicles
Gets Corroded By Sewage & Sea Water
Algate is Easily Formed Over Metal Surface
Standard Appearance
Painting Required at Regular Intervals
Higher Freight and Handling Cost, Due To More Weight
Painting Required Periodicaly To Save From Rusting

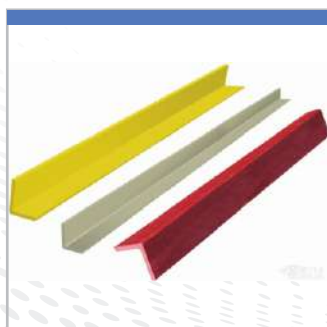
SIZES OF GRATINGS (30mm and 40mm Height)

48	1279
88	1319
128	1359
167	1399
207	1438
247	1478
286	1518
326	1557
366	1597
406	1637
445	1677
485	1716
525	1756
564	1796
604	1836
644	1875
684	1914
723	1955
763	1993
803	2034
843	2074
882	2114
922	2154
962	2194
1001	2234
1041	2273
1081	2314
1121	2353
1160	2393
1200	2430
1240	

L Angle

Key Advantages of FRP/GRP Pultruded Angle

- Corrosion resistance
- Self Pigmented, no painting required
- Chemical resistance
- Non-conductivity (thermally and electrically)
- Having non-magnetic electromagnetic transparency
- Being lightweight
- High-strength & durability
- Impact resistant
- Dimensional stability
- A long life cycle
- Low-maintenance



**THERMODRAIN FRP/GRP/COMPOSITE
WATER GULLY COVERS (WITH / WITHOUT FRAME)**

FRAME CLEAR OPENING & COVER OUT TO OUT SIZE		
RECTANGULAR		
Sr. No.	DESCRIPTION	SIZE
1	Frame Clear opening Cover Out to Out	640 mm x 240 mm 700 mm x 300 mm
2	Frame Clear opening Cover Out to Out	385 mm x 317 mm 445 mm x 377 mm
3	Frame Clear opening Cover Out to Out	335 mm x 930 mm 395 mm x 990 mm
4	Frame Clear opening Cover Out to Out	500 mm x 600 mm 560 mm x 660 mm
5	Frame Clear opening Cover Out to Out	600 mm x 450 mm 660 mm x 514 mm
6	Frame Clear opening Cover Out to Out	900 mm x 450 mm 965 mm x 515 mm
7	Frame Clear opening Cover Out to Out	900 mm x 600 mm 960 mm x 660 mm
SQUARE		
8	Frame Clear opening Cover Out to Out	300 mm x 300 mm 360 mm x 360 mm
9	Frame Clear opening Cover Out to Out	450 mm x 450 mm 515 mm x 515 mm
10	Frame Clear opening Cover Out to Out	600 mm x 600 mm 660 mm x 660 mm
11	Frame Clear opening Cover Out to Out	750 mm x 750 mm 816 mm x 816 mm
12	Frame Clear opening Cover Out to Out	900 mm x 900 mm 966 mm x 966 mm

Special Note :

The Gully cover (without frame) includes the INBUILT FRP BEAM support considering the support to the product is only on two sides. The Beam will be always in the shorter direction (unsupported side).

Water Gully Covers

With a better performance than Cast Iron, Ductile Iron and RCC Gully Covers, this product is an industrial revolution. They have been thoroughly tested as per BS EN 124, IS 1726 & AASHTO M306 standards for drainage and utility services. THERMODRAIN Gully Covers meet all the requirement of the code.

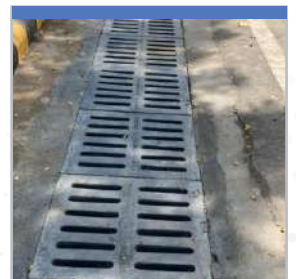
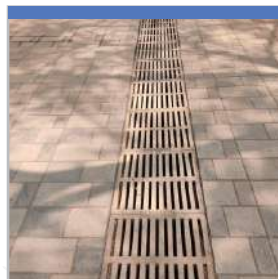
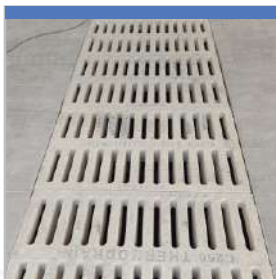
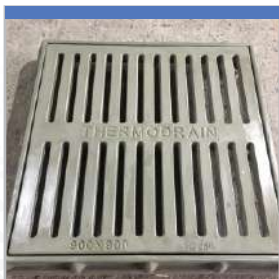
Our covers are available in all standard sizes with load bearing capacity ranging from 2.5 tons to 60 tons (E 600). They are available in square and rectangular shapes.

Salient Features

- Permanent set is zero in all sizes and load bearings.
- Self Pigmented / Non Painted.
- Minimum opening is more than 35% of clear opening size for smooth flow of water.

Areas Of Applications

- Swimming Pool
- Industrial Plants
- Podiums
- Basement Car Park
- Storm Water Drain Trenches
- Cable Trenches



COMPARATIVE CHART

THERMODRAIN FRP / GRP / Composite Water Gully Covers V/S Cast Iron / Ductile Iron Water Gully Covers

THERMODRAIN FRP / GRP / COMPOSITE WATER GULLY COVERS



High Strength To Weight Ratio
No Scrap Value Hence No Theft
Light Weight - Easy To Handle
Material Has High Impact Resistance Hence Doesn't Permanently Bend Due To Moving Vehicles
Corrosion Resistant, No Effect of Sea / Sewage Water.
No Algae Formation
High Aesthetic Value, Available In Dark Grey or Any Desired Color
Self Pigmented. No Painting Required
Less Freight & Handling Cost, Due To Less Weight
No Maintenance Required
Not Prone To Accident, As FRP Is Not Brittle, Hence It Does Not Collapse In The Chamber Due To Overload

CAST IRON / DUCTILE IRON WATER GULLY COVERS



Low Strength To Weight Ratio
High Risk of Theft
Heavy - Needs More Manpower
Material Is Brittle Hence Easily Cracks On Impact
Gets Corroded By Sewage & Sea Water
Algae Is Easily Formed Over Metal Surface
Standard Appearance
Painting Required at Regular Intervals
Higher Freight and Handling Cost, Due To More Weight
Painting Required Periodicaly To Save From Rusting
Prone To Accident, As Material Is Brittle, Hence It Collapses In The Chamber Due To Overload

Hinged Overhead & U. G Water Tank Covers

Thermodrain FRP / GRP tank covers serve a dual purpose. They are not only superior to conventional Cast Iron and Ductile Iron covers but are light weight. They are tested as per BS EN 124. Our covers are even immune to algae and rusting contaminants. They meet all the requirements of the code. They are available with load bearing of 500 kgs for overhead application and from 500 Kg to 60 tons for under ground applications.

Salient Features

- Covers have a provision for gasket fitting.
- Self Pigmented / Non Painted.
- 500kg rated covers have a provision for locking as a standard feature.
- Moss and algae formation do not happen in our covers.



Overhead Water Tank Covers - Chart

THERMODRAIN FRP/GRP/COMPOSITE WATER TANK COVERS WITH FRAME (180 degree opening with hinge & locking arrangement)	
Sr. No.	FRAME OPENING SIZE
1	600 mm (24")
2	600 mm x 600 mm (24"x 24")
3	750 mm (30")
4	750 mm x 750 mm (30"x 30")

Chambers

Specifications

- THERMODRAIN FRP Chambers are very strong made out of specially prepared resins.
- THERMODRAIN FRP Chambers are UV stabilised to protect from sun radiation.
- THERMODRAIN FRP Chambers will take any type of Traffic Loads.
- THERMODRAIN FRP Chambers are load tested upto 60 Tons.
- It can withstand all types of earth vibrations due to Traffic Movement.
- As per ASTM D 3753 & IS 12592-2008 standards.

Advantages Of FRP Chambers

- 100% Corrosion Free.
- Can be readily mounted by digging the Earth, making the concrete at the bottom & fixing it.
- Completely leak proof.
- All sizes are available.
- THERMODRAIN FRP Chambers are relocatable.
- Can also be used as Inspection Chambers.



FRP/GRP Drain Channels With Grating / Gully Cover

METHOD OF INSTALLATION OF THERMODRAIN (1 PIECE TYPE) FOR SURFACE DRAINAGE FOR EXTERIOR AND BASEMENTS (RECOMMENDED FOR SHORT LENGTH UPTO 30 MTRS)

STEP 1 - Prepare a trench of 200 mm extra width than the drain channel width.

STEP 2 - Before laying the Drain channel, check the compactness of the soil and ensure that its compact enough and will not sink due to the load that will be eventually applied on the Grating (refer to your civil or soil consultant). In case the soil is found to not take the load then you may create a concrete bed to resist the load with the slope of 1 mm/mtr. for water to flow by gravity.

STEP 3 - Once the concrete/mud bed is ready, you may place the Drain channel in position. The channel installation is to begin from the starting point and proceed towards the exit point.

STEP 4 - You may apply the Silicone sealant on the step given in the channel for joining with the connecting channel or Bend or Tee or Four way Tee. On applying the sealant you may place the connecting piece on the step and continue to place the further connecting pieces in the same manner.

STEP 5 - The connectors like the 90 deg. Bend, Tee and Fourway Tee are to be used as and where required depending on the layout of your site.

STEP 6 - You may refill the empty space around the channel network with the concrete and soil (As shown in the drawing) and do the required compaction and bring it to the level of the installed grating. Once the filling is completed and cured you may clean the drain channel and you may place the gratings/ Gully covers on the channel network.

METHOD OF INSTALLATION OF THERMODRAIN (2 PIECE TYPE) FOR SURFACE DRAINAGE FOR EXTERIOR AND BASEMENTS (RECOMMENDED FOR SHORT & LONG LENGTHS)

STEP 1 - Prepare a trench of 200 mm extra width than the drain channel width.

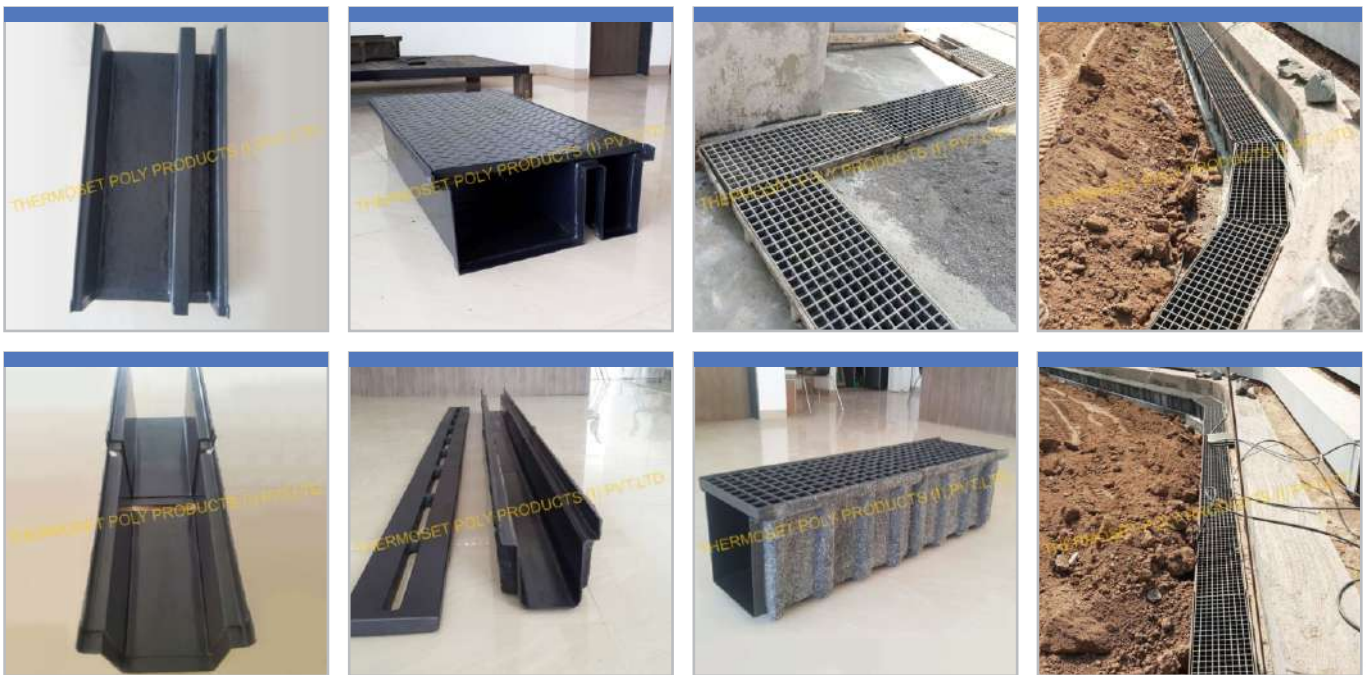
STEP 2 - Before laying the Drain channel, check the compactness of the soil and ensure that its compact enough and will not sink due to the load that will be eventually applied on the Grating (refer your civil or soil consultant). In case the soil is found to not take the load then you may create a concrete bed to resist the load with the slope of 1 mm/mtr. for water to flow by gravity.

STEP 3 - Once the concrete/mud bed is ready, you may place the PART 1 of the Drain channel in position. The channel installation is to begin from the starting point and proceed towards the exit point. You may apply the Silicone sealant on the step given in the channel for joining with the connecting channel or Bend or Tee or Four way Tee. On applying the sealant you may place the connecting piece on the step and continue to place the further connecting pieces in the same manner.

STEP 4 - Once part 1 of the drain channel is laid than you may start placing the part 2 of the drain channel by maintaining the level of the flooring. You may keep adjusting the part 2 in order to maintain the flooring level.

STEP 5 - The connectors like the 90 deg. Bend, Tee and Fourway Tee are to be used as and where required depending on the layout of your site.

STEP 6 - You may refill the empty space around the channel network with the concrete and soil (As shown in the drawing) and do the required compaction and bring it to the level of the installed grating. Once the filling is completed and cured you may clean the drain channel and you may place the gratings/ Gully covers on the channel network.



THERMODRAIN FRP/GRP/COMPOSITE DRAIN CHANNEL WITH GRATING / GULLY COVER

Sr. No.	OUT TO OUT DRAIN CHANNEL SIZE
1	128 mm(w) x 155 mm(ht.) x 1000 mm(lt.)
2	167 mm(w) x 155 mm(ht.) x 1000 mm(lt.)
3	326 mm(w) x 300 mm(ht.) x 1000 mm(lt.)
4	525 mm(w) x 300 mm(ht.) x 1000 mm(lt.)

ADVANTAGES OF FRP/GRP DRAIN CHANNELS

- Blocks site space for minimum time.
- Quick to install as the channel is only to be laid as per manual.
- Minimum manpower is required.
- **Very low labour** cost is incurred for installation.
- Installation is fast and simple and not dependent on huge manpower availability.
- No water proofing is required.
- Separate MS/FRP angles are not required for placement of Gratings/Gully covers.
- No hidden cost during installation of channels.

DISADVANTAGES OF CEMENT / CONCRETE DRAIN CHANNELS

- Site remains blocked due to larger preparation time of cement drains.
- Long installation time as large amount of civil work is required.
- Huge manpower is required for civil work.
- Very high labour cost is incurred for drain preparation.
- Preparation of drain channel is slow as it is highly dependent on manpower availability.
- Water proofing is to be done.
- Separate MS/FRP angles are required for placements of Gratings/Gully covers.
- There is hidden cost during making of drain channels as it is labour oriented.



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FRP/GRP/COMPOSITE Solid Top Manhole Covers With Frame, Multiple Covers With Frame, Recess Manhole Covers With Frame, Air & Water Tight Covers With Frame, Gratings, L Angle, Water Gully Covers With Frame, Hinged Overhead And U. G. Water Tank Covers With Frame, Chambers, Drain Channels With Grating / Gully Cover.

