SAFEGARD® SEPTIC TANKS

...an advanced solution for safe sanitation

The Supreme Industries ltd., is an acknowledged leader of India's plastic industry. It is credited with pioneering several path breaking products and has been a torch bearer in the transition from conventional to advanced plastic piping products in the country. Its customer centric approach fuels its research for designing unmatched quality products to meet the aspirations of its quality conscious customers. The innovative product portfolio offered by Supreme is extensive in range and application and comprises variety of pipes and vast spectrum of fittings totaling over 8500 diverse products.

After the success of Nu-drain Underground Drainage and Sewer System, we are proud to offer yet another innovative, useful and superior product i.e. readymade plastic septic tanks under the brand name "Safegard". Supreme Safegard septic tanks offers multiple advantages and have the potential to change the face of sanitation, construction and environment in the country. These tanks are in line with Central Government's initiative to provide sanitation to all. Together with Nu-drain Underground Drainage system, it will certainly enhance the quality of life by improving the hygiene across the country.

- **Unique patented design**
- **Strong and durable**
- **Excellent treatment efficiency**
- **Hygienic and safe**
- **Simple and quick installation**
- **Minimal maintenance**

Jeevan bhar ka saath...

Supreme® SAFEGARD® Septic Tanks

People who know plastics best

The System

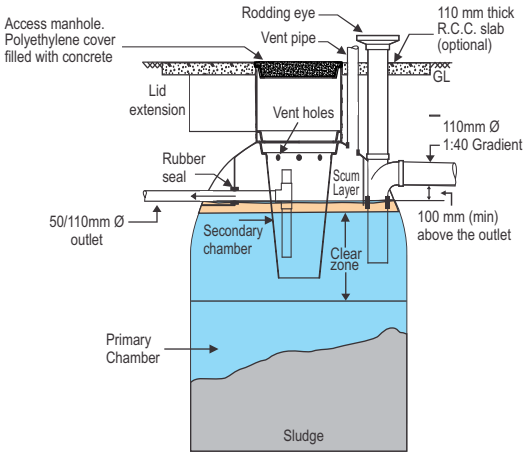
The Supreme Safegard septic tanks are designed to provide a better substitute to existing conventional brick and mortar septic tanks or tanks made out of Hume pipes. Conventional septic tanks are associated with multiple problems of corrosion and leakages thereby polluting soil and ground water. Besides cumbersome and time consuming construction and repeated maintenance requirements, the life span of these concrete tanks is short and uncertain. On the other hand, Supreme Safegard septic tanks are free from the above problems and offer many outstanding features.

Mechanism of Septic Tank Working

The purpose of a septic tank is to provide an environment for the first stage treatment in onsite and decentralized wastewater systems by promoting physical settling, floatation and the anaerobic digestion of sewage. Additionally, the tank allows storage of both digested and undigested solid till they are removed.

Septic tank allows the separation of solids from wastewater as heavier solids settles and the fats, grease and lighter solids floats. The solid content of the wastewater is reduced by 60-80% within the tank. The settled solids are called sludge, the floated solids are called scum and the liquid layer in between is called the clear zone. Although the liquid in the clear zone is not highly treated, it is greatly clarified compared to the wastewater entering the tank with larger particles having migrated to either the sludge or scum layers. Another important function of the tank is the storage of these accumulated solids. The tank is sized large enough to hold solids till their removal.

Typical section of septic tank



Components of septic tanks

Unique features

Rotationally moulded, one-piece construction - Supreme safegard septic tanks are manufactured by rotational moulding process which produces a one piece, seamless, watertight product.

Unique design -Safegard septic tanks have unique single piece two chamber patented design which allows for vertical settlement of the solids and are found to be much more efficient than conventionally built septic tanks.

Great strength - Robust in design with unique rib structure provides superior structural integrity to the tank. Making it very strong to meet various loading and handling requirements.

Simple and quick installation – Safegard ready to use septic tanks are light in weight making the installation very simple and quick. Minimum requirement of excavation further saves lot of time, energy and costs. Installation of these tanks can be carried out even by unskilled workers with little training. Any Safegard septic tank can be transported to the job site in a pickup van needs just two people to carry.

Excellent chemical resistance – Unlike conventional tanks, polyethylene is unaffected by soil chemicals and the chemicals and gases present in sewage. Therefore Supreme Safegard septic tanks do not rust or corrode and require no additional coatings. Safegard septic tanks are absolutely safe against ill effects of hydrogen sulphide (H_2S), a common problem with masonry or concrete septic tanks or the ones made from Hume pipes. Manufactured under strict quality guidelines, Safegard ensures an environmentally safe septic system.

Hygienic and safe - It is 100% watertight and hence guarantees against leakages preventing soil and ground water pollution.

Minimal maintenance required for these tanks saves time and costs.

Long life - expected to last 50 years i.e. the life time of a building under ideal conditions.

Ready to install complete pre-plumbed set - Safegard tanks are supplied as a complete set with necessary accessories like inlet and outlet connections, rodding eye, extension piece, cover and watertight seals on all joints. Thus, the tank that you receive is ready for installation.

Other features of Supreme Safegard septic tanks- (a) Free from corrosion and subsequent infiltration and ex-filtration problems (b) No root penetration (c) Minimum space requirement – Being available in ready to use form and vertical in design, these tanks can be installed in minimum space with minimum excavation (d) Can be relocated (e) Eco-friendly.

Product Range

We offer septic tanks in different sizes ranging from 1000 to 29500 ltrs capacity. Septic tanks up to 3000 ltrs are available in vertical design whereas, the septic tanks above 5500 ltrs capacity have modular horizontal design.

Vertical Septic Tanks

Septic tanks in vertical design has two separate integral compartment for proper settlement and decomposition of solid waste. The dimensions and product details are given in the following table

Product details of Vertical septic tanks

Capacity (ltrs)	Diameter (m)	Height (m)	Recommended users
1000	1.2	1.039	4 - 5 people
1500	1.2	1.410	5 - 8 people
1800	1.2	1.770	8 - 9 people
2000	1.7	1.019	9 - 10 people
3000	1.7	1.466	12 - 15 people

Includes lid, 110mm inlet and 50 or 110mm outlet provisions and can be made available with and without lid extension piece.

Cover solution

All the varieties of septic tanks are supplied with a plastic cover. This rotational moulded light weight cover can be directly fitted on the tank or tank extension piece and should be filled with Plain Cement Concrete (PCC). This economical version of cover can be used in areas where air or water tightness is not required. For LMV traffic areas GRP frame and covers are also available in 2.5 MT and 10 MT load class.

Modular Septic Tanks

Supreme has developed modular septic tanks to provide a practical solution for places where large size septic tanks are required. In modular septic tank design, different units are required to be connected in series with each other for increased capacity up to 29500 ltrs.

Flat sections of modular tank units are provided with the provision for pipe connection to adjoining units at 5 different places. Two adjoining units are required to be connected using 110mm size pipes and rubber seal. Connecting pipes should be of 500mm length

Vertical Septic Tanks

and the number of pipes to be connected varies depending on the size of incoming pipe(s). For 110mm size inlet, only one connection at the center of the tank is sufficient whereas for inlets of 160mm and 200mm size pipes, it is recommended to use 2 and 3 connections respectively. The dimensions and product details are given in the following table.

Product details of Modular septic tanks

Capacity (ltrs)	**Combinations**	**Inlet/ Outlet**	**Length** (m)	**Height** (m)	**Recommended users** (people)
5500	Stand alone	160	2.50	2.2	20 - 30
9500	Domed end 4750 ltrs x 2 nos.	160	4.10	2.2	30 - 50
13500	Domed end 4750 ltrs x 2 nos. + Inner 4000 ltrs x 1 no.	160	5.55	2.2	50 - 70
*15500	Domed end 4750 ltrs x 2 nos. + Inner 6000 ltrs x 1 no.	160	6.30	2.2	-
17500	Domed end 4750 ltrs x 2 nos. + Inner 4000 ltrs x 2 nos.	160	7.00	2.2	70 - 90
*19500	Domed end 4750 ltrs x 2 nos. + Inner 4000 ltrs x 1 no. + Inner 6000 ltrs x 1 no.	160	7.70	2.2	-
21500	Domed end 4750 ltrs x 2 nos. + Inner 4000 ltrs x 3 nos. / Inner 6000 ltrs x 2 nos.	160	8.45	2.2	90 - 100
*23500	Domed end 4750 ltrs x 2 nos. + Inner 4000 ltrs x 2 nos. + Inner 6000 ltrs x 1 no.	-	9.20	2.2	-
25500	Domed end 4750 ltrs x 2 nos. + Inner 4000 ltrs x 4 nos. / Inner 6000 ltrs x 2 nos. + Inner 4000 ltrs x 1 no.	200	9.90	2.2	100 - 130
*27500	Domed end 4750 ltrs x 2 nos. + Inner 6000 ltrs x 3 nos. / Inner 6000 ltrs x 1 no. + Inner 4000 ltrs x 3 nos.)	200	10.50	2.2	-
29500	Domed end 4750 ltrs x 2 nos. + Inner 4000 ltrs x 5 nos. / Inner 6000 ltrs x 2 nos. + Inner 4000 ltrs x 2 nos.	200	11.40	2.2	130 - 150

*Marked sizes will be shortly introduced.

Note- *Specified users are based on flow rates of 80 to 120 ltrs/person/day and 4-5 years cleaning frequency. Modular units are supplied with connecting pipes and rubber seals.*

Modular Septic Tank

SAFEGARD® Septic Tanks

Installation procedure for vertical septic tanks

1. Excavation

Excavate a pit approximately 600mm larger than the size of septic tank. Depth of the pit should be decided based on position of inlet and outlet with required gradient and disposal point plus 150mm extra for bedding.

2. Bed preparation

Provide 150mm (6") thick bedding of granular material with compaction to form a even, flat and sufficiently hard foundation for the septic tank. There should not be any sharp objects/stones etc. protruding out of the base which could puncture the tank.

3. Positioning the tank

Lower the tank and position it in the pit ensuring that it is vertical, centrally positioned, correctly aligned and leveled using a spirit level. The outlet pipe should face the soak pit and inlet pipe swivels, ensuring a straight connection.

4. Fill the water in the tank and then carry out backfilling

Fill up the tank with water using tap up to 1/3rd capacity. Then Start the backfilling in layers with a max. of 250mm thickness. Backfilling and water filling should be carried out simultaneously ensuring that the backfilling level never exceeds the rising level of water within the tank until the water overflows through the outlet pipe, thus indicating the tank is full. The width of the backfilling around the tank should be minimum 300mm (12"). Excavated soil can be used if it is silt, sand or soft murum but in case of black cotton, loamy or marshy soil only recommended inert granular material i.e. sand/stone dust/gravels (max size 10mm) should be used as backfill material. It is particularly important to note that excavated material consisting of rock, peat or clay is not to be used as backfill material.

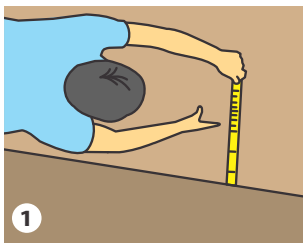
5. Make the pipe connections

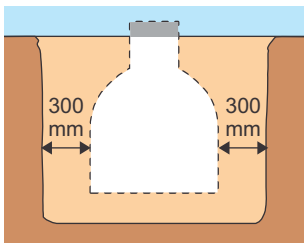
When the level of the backfilling reaches up to the underside of the outlet pipe then the remaining pipe connections include vent should be made. It is recommended to maintain 1:40 to 1:60 fall between drain head and inlet of the septic tank.

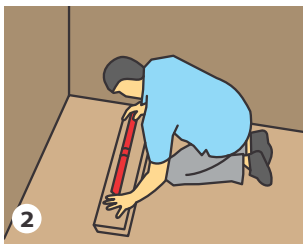
Venting: Connect vent pipe of 50mm diameter on the vent outlet provided on the tank.

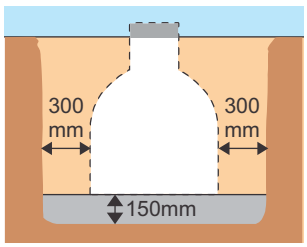
6. Final backfilling

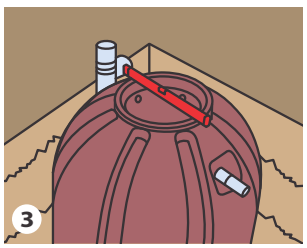
After making the pipe connections, complete the backfilling up to the top level of the tank. In case of non traffic conditions, normal flooring like PCC/paver blocks etc. can meet the requirements.

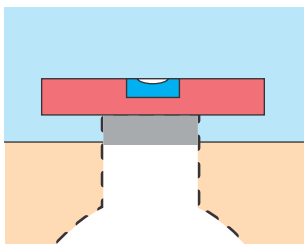


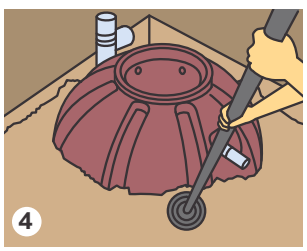


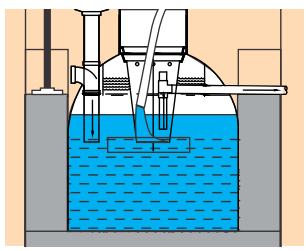


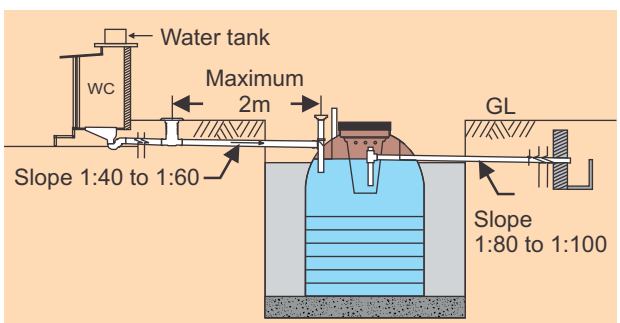




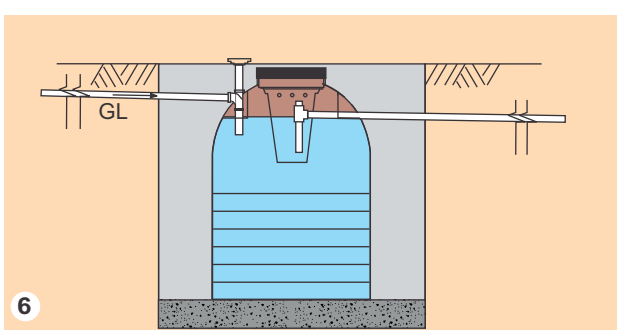






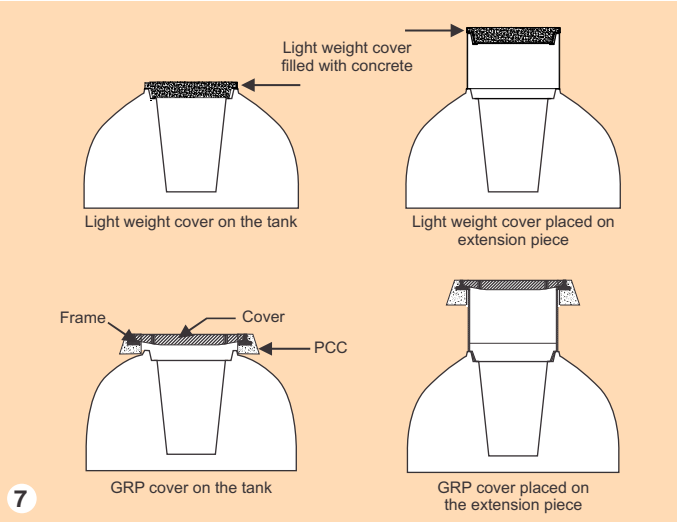


In order to comply with the national building requirements and building codes, an inspection chamber should be placed within 2m of the inlet to the septic tank which allows any matter causing a blockage to be removed before its entering the system.



7. Providing cover/lid

Select the appropriate cover as per the site loading conditions and place it on the top of the tank. In case of pedestrian movement where vehicular loads are not expected, plastic light weight cover is recommended. This plastic cover should be filled with concrete after placing it on the septic tank. For vehicular traffic movement, GRP cover of appropriate load class is recommended. For GRP covers 150mm thick PCC (min M150 grade) beneath the cover frame for full width of tank is recommended. After embedding the frame, place the cover as shown in the figures.



Guidelines for abnormal conditions

- In case of marshy/black cotton and loose soil, or where the water table is a problem, excavated soil is not recommended. For backfilling, a cement-stabilized backfill mix of 5% cement and 95% inert granular material must be compacted in 250mm thick layers to 90% Proctor density and 6" thick R.C.C. with nominal steel enforcement is recommended at the top.
- In case of soft murrum, it can be used as backfilling material with proper compaction (90% of Proctor density), in 150mm thick layers.
- Care should be taken to avoid direct contact of sharp edged objects with the tank.
- In case of high water table areas, septic tanks should be anchored in concrete as per the guidelines of engineer in charge.
- Safegard® septic tanks are not designed to be buried more than 0.5m below ground level. If depths are greater than 0.5m, please refer to site engineer/architect.

In case of abnormal conditions like vehicular traffic, rocks, black cotton soil, or when the high water table is anticipated or when the backfill above the lid exceeds 0.5m, the final design rests with the engineer or architect on the project. However guidelines given herewith must be strictly followed for satisfactory performance.

Installation procedure for modular septic tanks

During modular septic tank installation, we have to use two or more modular units as per the required capacity. The installation principle and procedure remain same but extra precautions need to be taken and adjacent units are required to be internally connected using connecting pipes. For installation procedure of modular tanks, we advise you to follow the detailed procedure as given in the user guide.

Disposal of septic tank effluents

The effluents discharged from the septic tanks may contain disease causing germs and pollutants. Hence it must be treated to protect human health and environment. Therefore it is essential that these effluents should be carefully and safely disposed which could be done by providing drain field or soak pit to facilitate disintegration through bacterial action.

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