USER GUIDE

RAINY
FL 80

Dual Intensity Rainwater Harvesting Filter®

Rainy™

Farmland Rainwater Harvesting Systems

E-mail: farmland_rhs@yahoo.co.in | Website: www.rainyfilters.com

Winner of National & International Awards from

Indian Green Building Council
MEMBER

JSW - THE TIMES OF INDIA
EARTH CARE AWARDS 2010 & 2014
Awards for Excellence in Climate Change Mitigation & Adaptation
'Innovation for Climate Protection'

CII
As a 'Most Innovative Water Saving Product'

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PLEASE NOTE

1. Read and understand all instructions in the USER GUIDE for the best product utilization.
2. To set up the system, refer INSTALLATION SECTION Page No. 14 Of the User Guide.
3. If you have performance related problems, refer TROUBLE SHOOTING SECTION page No. 26 of User Guide.
4. There may be chances of slight variations in efficiency of the Filter. This is due to the type of roof, pipes, fittings and angles of installations, pattern of rainfall etc.
5. The Product Specifications are subject to change without prior notice.

WARRANTY

RAINY warrants its product to be free from defects in workmanship and materials, under normal usage and conditions, for a period of TEN (10) years from the original invoice date by Mfg/Authorized Dealers. This warranty covers the repair or replacement of any faulty components of the said filter at our discretion. There is no coverage provided for lost or destroyed filters. For further information refer to Warranty terms and conditions furnished under WARRANTY SECTION Page No. 28 of the User Guide.

Contents

General information about Rainwater Harvesting System

Rain is the first form of water that we know in the hydrological cycle, hence it is the primary source of water. Rainwater Harvesting is the activity of direct collection and storage of rainwater, rather than allowing it to run-off. The rainwater so collected can be stored for direct use or can be re-charged into the ground water source. In present times, we depend entirely on secondary sources of water such as rivers, lakes, bore-wells, etc. In the process, it is forgotten that rain is the fundamental source that feeds all these secondary sources. Rainwater harvesting is the key to sustainable future and a substantial step for mitigating climate change.

Quality of Rainwater

Rainwater is regarded as the purest form of water in nature. All the natural water contains dissolved ions (anion and cation) within them.

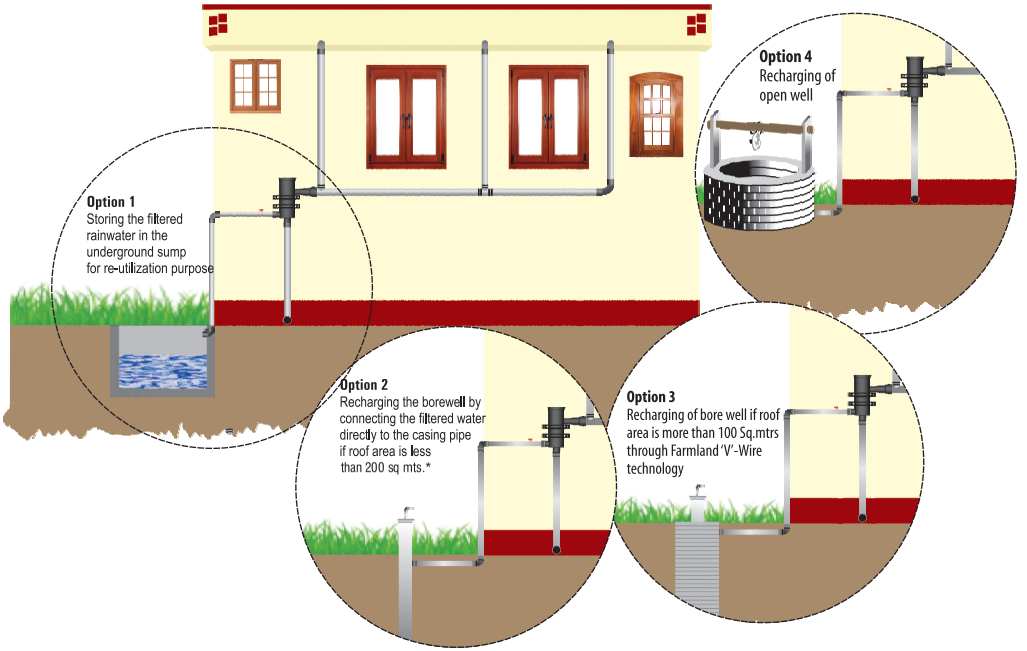
Rainwater is formed due to natural distillation process (i.e.) evaporation, condensation and precipitation. It is supposed to be in very dilute solution with very less dissolved solids generally between 10-20mg/Liter.

All the dissolved ions present in them are in the range of 1-3mg/Liter.Therefore, rainwater is considered to be pure and can be used for regular usages. Additionally, their pH is between 6.7 and 7.2 for consumption purposes. This concentration varies regionally.

Why Rainwater Filters are required?

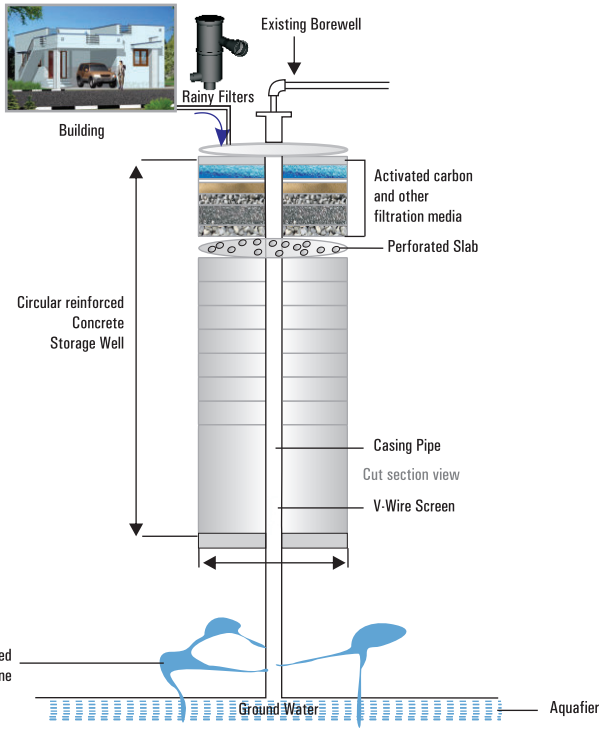
Even though Rainwater is the purest form of water, while it pours down on the roof of the buildings it gets mixed with dirt particles, leaves, debris, bird droppings and other undesirable substances deposited on the roof and flows through the Rainwater Drain pipes. To flush out these impurities before letting the water into the Sump or Recharging well, appropriate filter has to be incorporated by studying the size of the buildings roof area, intensity of rainfall, sizes of the pipeline, sump capacity and Filter capacity etc.

Various applications through 'Rainy' Filters



*Please note that the intake of rainwater depends upon the characteristics of individual bore wells. Sometimes, the water may percolate through the casing quickly and in some cases, the bore well may overflow. In that situation, it is advisable to go for a recharging well as in **Fig.3**

Rainwater Harvesting from Roof top Buildings (Bore Well Recharge Injection Well)



Groundwater recharging (Bore-well Recharging) through Rainwater.

If the rooftop area is more than 200 Sq. meters, the rooftop water can be directly diverted to the bore-well through a rainwater filter. Else, the surface run off is channelized to the recharging structure as follows; 'V'-wire injection well' technology can be used to recharge groundwater sources and replenish the water table. Run off rainwater is made to pass into a silt trap through a channel and then to an injection well. Here, it goes through multiple filtration media and is eventually passed on to a specially designed storage well. The storage well has dual non clogging 'V'-Wire screens attached to a percolator pipe. The clean water is then made to percolate into deep layers of the earth's strata, ultimately recharging the groundwater source and replenishing the water table.

General Technical Information

1 meter	=	3.281 feet	1 Imp gallons	=	4.546 liters
1 Square feet	=	0.092 Square Meter	1 cubic feet	=	28.32 liters
1 Square Meter	=	10.7584 Square Feet	1 cubic feet	=	6.23 imp. Gallons
1 Inch	=	2.54 centimeters (25.4 mm)	1 cusec	=	28.32 liters/ second
1 feet	=	304.8 millimeters	1 Mtr^3	=	0.277 liters per second
1 Hectare	=	2.475 Acres	1 LPS	=	3.6 Mtr^3/hour
1 Acre	=	0.404 Hectare	1 kg/cm^2	=	14.3 Pound per square inch
1 Acre	=	4050 Square Meter	1 kg/cm^2	=	32.8 feet of water
1 Acre	=	43560 Square Feet	1 PSI	=	2.3 feet of water

1 square meter of area at the rate of 25.4 mm precipitation of rain fall, the collection of water=25.43 liters, therefore, 1 acre of area (43560 SQFT or 4050 SQMTRS) yields 103012.36 liters of water.

Example: Considering 100 Square Meters of Roof area.

Calculation: Roof area in Square meter x coefficient of friction of roof x filter efficiency x rainfall in mm = water in liters.

Coefficient of friction: evaporation, friction and absorption of water by the roof etc. Usually 15 to 25% loss of water will be occurred depending upon the type of roofs.

Filter efficiency: It depends upon the type of filter and manufacturers guarantee on performance and efficiency of filter

Rainfall in millimeter: Per day's highest rainfall or per year's average rainfall to be considered.

Roof area-100 SQMTRS, Coefficient of friction-0.85%, Filter Efficiency-90%, Average Rainfall/year considered 1000 mm.

100x 0.85x 0.90 X 1000= 76500 liters

To calculate the required tank size:
Size of the water storage tank can be decided based on the Roof area available for harvesting the rain water while considering either highest rainfall per day or 5% of average annual rainfall. For the above said area the ideal tank capacity would be 5000 liters.
Note: While calculating the sizes of water tanks, filter, rain gutters, down take pipes etc. it is suggested to assume 20% higher capacity than the original value in order to round off the error and to accommodate slight tolerance range.

About Us

Farmland Rainwater Harvesting Systems (FLRWHS), founded in 2002, aimed at end to end solutions for installations of Rainwater Harvesting Systems including patented products and ongoing R&D Mfg.

Our mission statement is to conserve every drop of rainwater by using continuous innovation.

Giving back to nature and reducing our carbon footprint for a greener tomorrow is at the core of everything we do.

We are building scientifically engineered systems of RWH, which will enable customers with economical, high quality and easy to maintain products.

We pride ourselves in having our own research facility, which has our Hydraulic Testing Lab equipped with the latest machinery.

Our widespread dealer network spanning over 11 countries with highly trained field service engineers are always available to solve every query.

Introduction

Congratulations on adapting RAINWATER HARVESTING SYSTEM by installing our state of the art 'Rainy' Dual Intensity Rainwater Harvesting Filter. We appreciate your initiative towards water conservation.

'RAINY', first of its kind Rainwater Harvesting Filter with unique self-cleaning and auto flush out arrangements.

The 'RAINY' Filter in your possession is the result of over 20 years continuous R&D done by the team of FARMLAND RAINWATER HARVESTING SYSTEMS, by studying the pattern of rainfall in rural and urban areas, intensity of rainfall, type of houses, pipeline used for rainwater outlets, re utilization, recharging of ground water and Tube well etc.

Our continuous efforts, extensive research and development work of over two decades resulted in the invention of a completely revolutionary type dual intensity Rainwater Harvesting Filters, works by gravity, based on the working principle of cohesion and centrifugal force. The key point of this filter is the self-cleaning mechanism in eliminating the need of periodic maintenance. Constant innovations with the help of cutting-edge technologies led to further improvement in the design and manufacture of the rainwater harvesting filters.

It is scientifically designed and built to give you a long and dependable service. Careful selection of materials and manufacturing assures you a satisfactory performance as per the filter rating. All materials used in this technology are highly durable and recyclable.

In recognition of the successful implementation of the technology, involving, Rooftop “Rainy” rainwater harvesting filters enabled various walks of life overcome the water crises in most drought prone districts belonging to various states of India. The implementation of this nascent technology is recognized and awarded with Few National Awards and International Awards, National award in the year 2009 from Confederation of Indian Industry (CII) as “Most innovative Water Saving Product” and International award in the year 2010 from JSW The times of India “Earth Care Award for Innovation for Climate Protection”. In addition to various other recognitions FLRWHS has received the prestigious “Green Champions Award” in the year 2011 presented by Indian Green Building Council. In the year 2014 another International award from JSW The Times of India “Earth Care Award” Awarded to FLRWHS in relation to our Innovative FL-V Wire Injection Well Technology involving ground water recharge in the Category of ‘Innovation for Climate Protection’, National award by Aqua Foundations as Aqua Foundation Excellence Award 2017 under the category of Industrial Excellence in Development of Technology in the Field of Rainwater Harvesting, In the year 2018, SKOCH group conferred highest independent honour by endowing SKOCH award Achiever Silver for the innovation of ‘Rainy Filters’.

‘RAINY’ Filter will give you years of trouble-free performance if handled with care. This User Guide is a step in this direction. It covers general instructions about installation and operation of ‘Rainy’ Filters. Read this manual and comply with the instructions so that your Rainy Filter is bound to serve you well.

Function of the Filter

'Rainy' Filters are designed with self-cleaning mechanism and can be fixed to the wall by connecting Rooftop Rainwater Drain Pipes.
The Rainwater along with dirt & debris flows by Gravity through the down take pipes, enters into the filter, starts rotating in anticlockwise direction at the periphery of the upper housing so as to flow into the SS-304 filter element placed in the lower housing in angular Motion at specific speed & velocity which creates Cohesive force at low intensity & Centrifugal force during high intensity of rainfall. In both situations, involving Low & High Intensity of rainfall, the working principle of the filter based on Cohesive & Centrifugal Force respectively, aids the filter element to flushout automatically the dirt & debris through the Open ended drain Outlet and simultaneously divert clean water into the storage structure (sump) or recharging well through the Clean water Outlet, which can be used for reutilization or Recharging of Groundwater Source.

Special Features

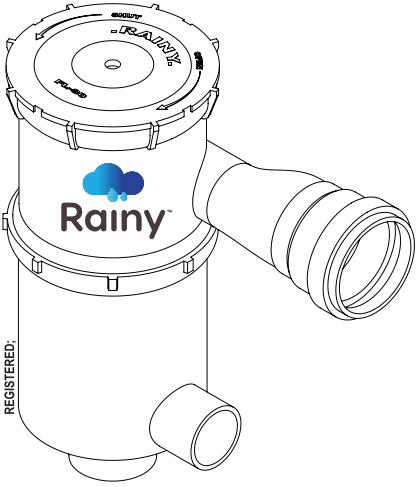
- Since the filter assembly is an open-ended system, it does not allow for the stagnation of water and solid particles, eliminating the need for periodic maintenance.
- The filter has self-cleaning capabilities enabled by its unique working principles, with efficiency of over 90%.
- No external source of energy is required, because the filters are designed to operate by Gravitational force.
- Rainy filters are extremely versatile such that they can be accommodated anywhere, from being wall mounted on low lying roofs to underground ducts.
- Tough UV stabilized high density polyethylene Housing.
- Filter Element SS-304 Mutli-surface Screen food grade.
- All the material used are food grade and recyclable.
- Filter Pipe connections can be turned up to 360 Degrees allowing it to suit the given site conditions

- Simple in connection, which any local plumber can easily install.
- The filter efficiency remains unchanged even with the variation of intensity of rainfall.
- The filters do not have any moving parts, there is no wear & Tear of the filter, allowing for long life span.
- Various models are available to cater to various dimension of roof areas.
- 'Rainy' filters are cost effective and affordable to the common man.

Advantages:

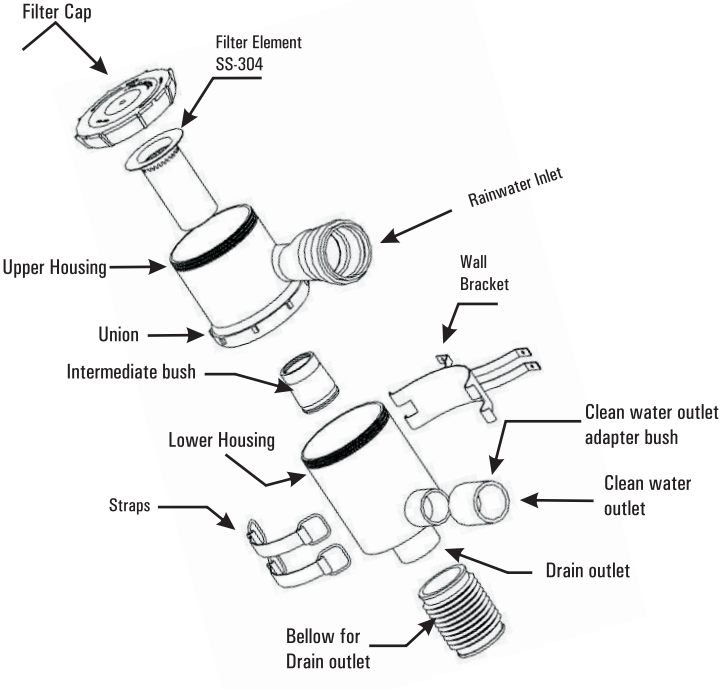
- By storing of water in the sump & reutilizing, around 35% of the annual requirement of a household can be met. Thereby a considerable amount on the water and power bill can be saved.
- Dependency on water tankers, ground water and corporation water can also be much reduced.
- Reduces significant carbon foot print.
- Technology works on the Gravitational Principle so saves power (reduces the pumping of water from distant places & depths).
- Swirling movement of water is formed while 'Rainy' filters are under operation, this leads to aeration of water. Thus, increases the water quality.
- Prevents over exploitation of ground water source.
- Prevents water logging in low lying areas.

Rainy FL80 - Technical Parameters



Technical Specifications & Parameters of Rainy- FL 80	
Suitable for Area	Upto 120 Sqmtrs
Intensity of Rainfall	5 mm/Hour to 75 mm/Hour
Filter Type	Open ended, non-clog
Working Principle	Cohesive Force & Centrifugal Force
Operating Pressure	> 1 foot of gravity Head (0.060kg/Cm2)
Max Discharge at (CWO)	120 LPM
Filter Element	SS-304 Multi-Surface Screen - Food Grade
Mesh Size	250 Microns
Inlet Size	90 MM
Clean Water Outlet Size (CWO)	63MM
Drain Outlet Size	90 MM
Filter Housing	UV Stablized - HDPE
Filter Efficiency	Above 90%*
Source of Power	Gravity

Overall View of Dual Intensity Rainwater Harvesting Filter



S.I.No.	Description	S.I.No.	Description
01	Filter cap	06	Straps
02	Upper Housing	07	Wall Bracket
03	Union	08	Lower housing
04	Filter element - SS 304	09	CWO adapter bush
05	Intermediate bush	10	Bellow for drain outlet

Filter installation - Instructions

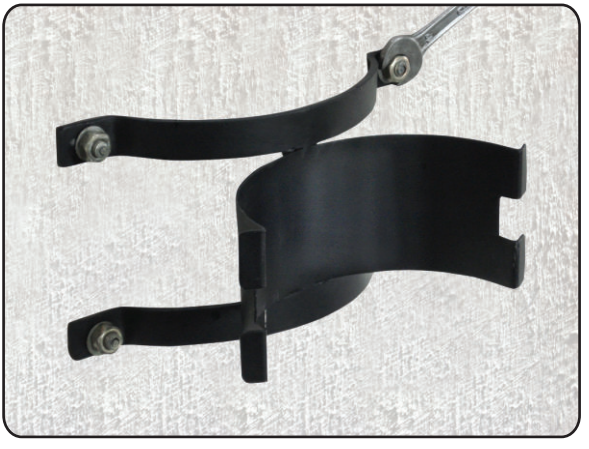
Keep the Roof clean.

Inter connect the down flow pipes and draw
the line till the point of Filter location.

Place the filter assembly on the wall bracket. Then, pull the strap and hook up to the wall bracket.

Place the filter against the wall to spirit level as shown in the figure and mark the point to fix the wall bracket.

Drill the holes to the wall as per the marking.



Fix the wall bracket with anchor bolts and tighten the nuts correctly.

Place the filter assembly on the wall bracket. Then, pull the strap and hook up to the wall bracket.

Set the direction of filter inlet and outlet just rotation to suit the pipe connection by hand.

Rainwater Inlet Connection

Once the direction of filter inlet and outlet pipe connections are set connect the down spout pipe to the inlet of the filter.

Fix 'L' angular clamps with 'U' bolts and anchor bolts with adjustable 'C' Clamps at inlet pipe.

Drain Outlet Connection

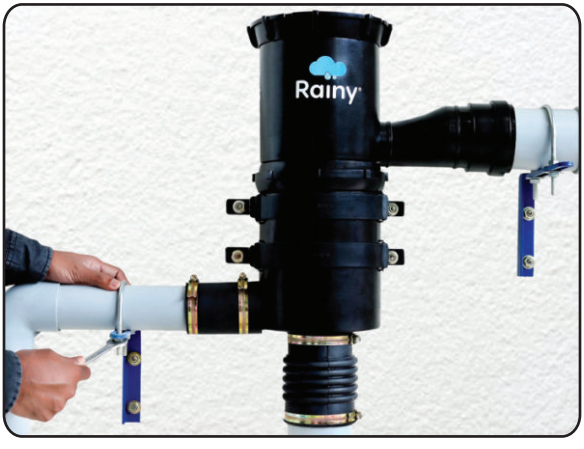
Insert the bellow to the drain outlet with clips.

Insert PVC pipe with elbow into the bellow.

Fix the 'L' angular clamps with 'U' Bolts and clips to sustain the weight of the drain pipe.

Delivery Line

Insert adapter bush to the clean water outlet.

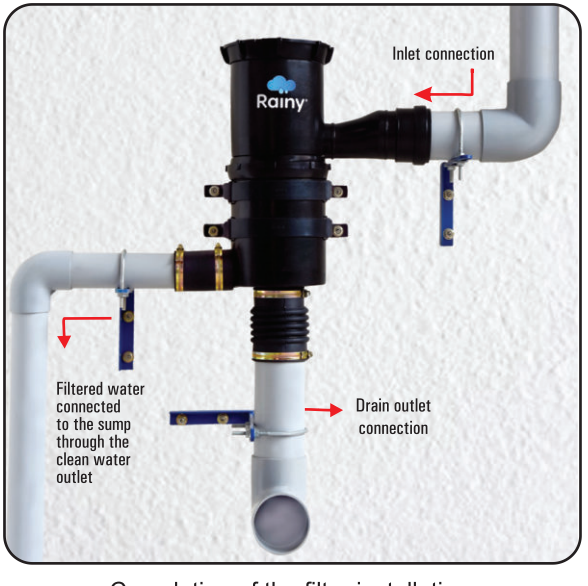


Connect the delivery line to the sump/recharging well with necessary length of pipe and fixtures.

Remove the filter cap by rotating in clockwise direction.

Insert the filter element inside the upper housing.

Lock the filter cap by rotating anticlockwise.



Completion of the filter installation.

1. In low operating UNITS (Dizzling Rain Fall)
2. In asbestos sheet rooftop
3. In dust prone areas
4. Where lots of Moss is grown on rooftop

Frequent cleaning of filter element is advised

Unlock the filter cap with two hand rotation and remove the filter outside for cleaning purpose. Direction of Unlock: Clockwise.

Wash the filter element with a Garden hose pipe or under the tap.

Clean it up with a brush

Wash it, Clean it well and re-insert the same.

Once cleaning is done, lift the filter element and observe the sunlight, light should pass through the filter element sieve. If sunlight passes, re-insert the filter element.

Even after cleaning by brush in regular course, if light does not pass, It is an indication of stubborn dirt remains in the sieve and blockage of Screen. This may hamper the filter efficiency, releasing more discharge at drain outlet.

In such instances kindly clean the filter element with high pressure nozzle by taking it to the nearest water service station till clear light passes through the filter sieve.

Trouble shooting information

Problems	Solutions
Low discharge at the clean water outlet and high discharge of water at the drain water outlet	1. Open the filter cap and check if there is any blockage in housing or filter element. In case of any blockage of housing or filter element, clean the same. 2. Under low Intensity or asbestos sheet rooftops and dust prone areas, frequent cleaning of filter element is advised.
During water logging on rooftop/ insufficient discharge to the filter INLET.	3. Check the filter element (SS-304). In case a clogging is observed, remove the same and wash it with garden hose or under the tap, clean it up with a brush. After the wash and proper cleaning re-insert the filter element and tighten the filter cap. This should bring back the filter to normal operation. Clean the filter element periodically to avoid clogging. If excess of clogging in the element is observed in such instances kindly clean the filter element with high pressure nozzle by taking to the nearest water service station till clear light passes through the filter sieve 4. There might be chances of blockage at entry point of roof top rain inlet pipe, blockage in the elbows or joints of Rainwater pipe line connections, blockage at filter entry point, blockage in the horizontal pipeline, blockage in Drain outlet, Improper selection of pipe diameter, etc. Check all the above parameters, clean the roof top, remove the blockage, repair & re-fit the pipeline and test the system for free flow. 5. In the event of longer length of delivery pipeline, proper gradient is maintained to flow the water by gravity, otherwise the water may bounce back therefore, so in such situation Proper gradient to be maintained 6. In delivery pipeline if any size of the pipe increase more than the original size there are chances of bouncing back the water in such situations maintain the standard size of the filter specified.

Do's & Don'ts

- Always keep the rooftop clean and do not keep any hazardous materials like paints, glass items, chemicals, rusted old junk materials etc, on ROOFTOP.
- Sheltering and leashing of domestic pets on Rooftops is to be strictly avoided in order to maintain the cleanliness and to avoid the contamination of rainwater.
- Do not wash clothes on the Rooftop, this leads detergent water to sump or Recharging well. It is very harmful to the human health. Precautions should be taken to avoid the detergent water reaching the sump or the Recharging well. Rainwater is the purest form of water, if you want to use for potable use, it is advised to analyze the water by competent Authorities before potable usage.
- Do not keep your tank's door open. Exposure of rainwater to atmosphere leads to speedy algae formation. Avoid exposing the water stored in the sumps to direct sunlight and air.
- Rainy Filters works on Gravity. Therefore, make sure that the level of Delivery pipe line always runs down below the clean water outlet line. Also, make sure that the gravity head is more than one (1) foot (0.06kg/cm2)
- Rainy filters are open ended. Therefore, do not close the drain outlet at any given point.
- Select the appropriate filter model based on your rooftop area. If the roof area exceeds the filter-specific area, there might be variations in filter performance. This might lead to overloading and can cause damages to the pipeline, ejecting the overflow from the filter or up towards rooftop.
- If the rooftop is very high (30 MTRS and above) the water Pressure should be brought down by incorporating air releaser in series with the pipeline or through any other method that can bring the Pressure down. This is done to avoid water hammer.
- Rainy Filters are exclusively designed for rainwater harvesting. Do not use these filters for other purposes.
- Rainy filters are designed to remove only suspended Particles up to 250 Microns. These filters do not filter biological or chemical contaminations.
- Do not use any chemicals while cleaning the filter/filter element.
- Strictly restrict the entry of hazardous chemical substances to the filter.
- Filter must be installed away from any heating units / electrical components/ gas cylinders/ furnaces etc. This may lead to damage/destruction of the filter.

Rainy™

WARRANTY CERTIFICATE

We hereby warrant the filter to be free from material defects and workmanship, under normal usage and conditions, for a period of TEN (10) years from the original invoice date. This warranty covers the repair or replacement of any faulty components of the said filter at our discretion. There is no coverage provided for lost or destroyed filters.

Customer's Name :.....

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Contact No. (Mobile) :.....

E-mail ID :.....

Address :.....

Filter Model: Rainy FL-80 S/N : .....

Date of Purchase :..... Invoice No :.....

Dealers address :.....

.....

RAINY FILTERS WARRANTY TERMS AND CONDITIONS

RAINY warrants its product to be free from defects in workmanship and materials, under normal usage and conditions, for a period of TEN (10) years from the original invoice date. This warranty covers the repair or replacement of any faulty components of the said filter at our discretion. There is no coverage provided for lost or destroyed filters. Thereof and in accordance with the user manual, and shall provide warranty services subject to the following:

1. This Warranty covers the defects resulting from defective filter components, materials or manufacturing, if such defects are revealed during the period of 120 months since the date of purchase.

2. The filter is considered defective if it fails to perform the functions as indicated in the user manual, brochure, technical guide or any other similar documents supplied with the filter.

3. The Warranty does not cover consumables or parts of limited regular functionality that might be employed during installation.

5. The warrantor shall not be held responsible for the loss and damage caused due to restoration/alteration/modification of any filter component.

6. The defects and damages revealed during the Warranty period shall be removed free of charge exclusively by the Warrantor only on producing original invoice copy issued by authorized supplier or other similar documents.

7. Repair and replacement time of defective filter/components may be subjected to extension.

8. Warranty services will be provided under the following conditions:

    a. Immediately and effectively notify warrantor about determined filter's defects and cease any further usage.
    b. A copy of commercial invoice/ Certificate of warranty issued by authorized supplier/manufacturer should be provided to the warrantor along with the defective/damaged filter.

c. The serial number of delivered defective/damaged filter device must match the serial number present in Warrantor's data base.

d. The defective/damaged filter must be appropriately packaged during its loading, transportation and unloading. The said filter has to be sent through authorized RAINY dealer or directly to the manufacturer; in either case, the buyer is liable for complete transportation charges.

9. The Warrantor reserves the right to charge the Warranty beneficiary with the costs of service, complete transportation charges, and customs clearance if the defect does not fall within the scope of this Warranty or the device has not been proven defective.

10. The Warranty does not cover:

a. Damages caused by acts of God, floods, fires, lighting or other natural disasters, wars, unexpected events or other external factors.

b. Mechanical/physical damages resulting from incorrect installation, usage or other activities inconsistent with the user manual or technical guide.

c. If the filter that has been tempered with by the Warranty beneficiary or any other third party.

d. Damages/defects resulting from the usage of improper or after market components.

e. Damages/defects due to the user's misuse or lack of knowledge.

11. The replaced defective filter or components shall become the property of the Warrantor.

12. The Warrantor reserves the right to refuse to provide any Warranty services if it would result in a breach of warranty terms and conditions.

13. This Warranty Terms and Conditions may be changed if the Buyer and the Warrantor establish different conditions in a separate agreement.

RAINY
FL 80

Dual Intensity Rainwater Harvesting Filter®

Customer Care address:

Farmland Rain Water Harvesting Systems
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Kasaba Hobli, Chikmagalur Taluk-577133
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