PURAIN DN 200/300/400 (8”, 12”, 16” Inlet)

Rainwater pre-filter for in-tank and external mount

Installation and operating instructions

PURAIN DN200-400 Standard

1. Note:

Updated technical data, scope of application and basic dimensioning are available at:

http://us.intewa.net/en/products/purain/technology/

Various filter tests and reports are available for download at:

http://us.intewa.net/en/products/purain/downloads/

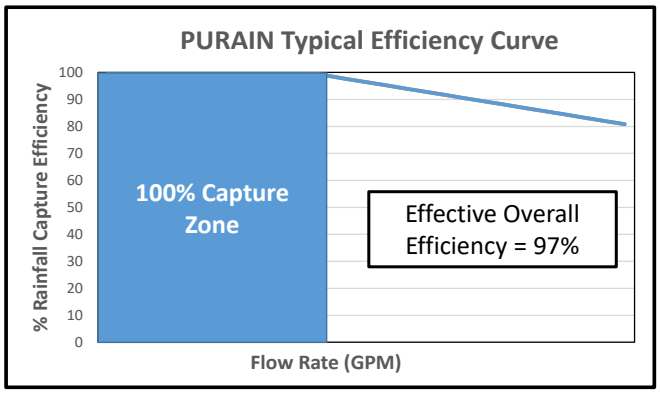
2. Features:

Thank you for your INTEWA PURAIN pre-filter purchase.

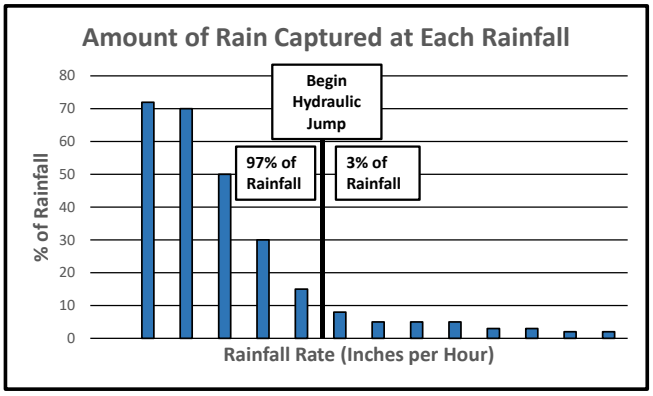
Your PURAIN rainwater filter provides optimal rainwater quality in your tank and captures the most water with minimal maintenance.

PURAIN rainwater filters (also known as hydraulic jump filters) deliver high performance filtering of rainwater before it enters the cistern. Hydraulic jump technology means that the filter cleans itself automatically. In the design, water flow is substantially altered at high flow due to a height drop, from a sub-critical to a super-critical flow. At the bottom of the collection chamber, the water flow alters again to a subcritical flow in a process now commonly known as an hydraulic jump. This resulting increase in water power is similar to a strong eddy and forces any impurities over the next level to be washed away to discharge. PURAIN rainwater filters are designed to filter rainwater coming off roofs made from any typical roofing material.

Independently tested, PURAIN is more efficient at catching rainwater than other filter. 100% of water is captured up to a certain flow rate equal to a fairly heavy rainfall. No other self-cleaning filter can claim that.



After this point, a hydraulic jump is created to vigorously clean the filter screen. Since most rain in any geography falls at a low flow rate, PURAIN has a big advantage at catching this water. All other self-cleaning filters lose some water at low flow rates. See specification sheet and website for more details.

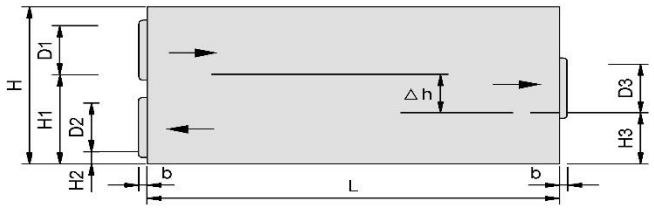


3. Product Data:

The PURAIN filters are is sized to handle an inlet and discharge pipe size of 8” to 16” depending on the model. See specification data below or refer to separate cut sheet. The female connectors are sized for SDR 35 PVC pipe (see installation instructions for use of other pipe sizes). Standard engineering flow calculations apply. Using European standard DIN 1986, there is a maximum rated flow for each filter size, for design purposes. This standard assumes a 1.5% fall and 75% full pipe. These flow rate maximums are shown below:

PURAIN Model	Pipe Diameter (in.)	Max Flow Rate at 1.5% Fall (GPM)
DN200	8	576
DN300	12	1684
DN400	16	3632

There is some elevation loss through the filter which equates to less than on pipe diameter. Screen mesh size is 800 microns which is well within requirements of ASPE 63 requirements.



Specifications	*DN200*	*DN300*	*DN400*
Rated Maximum Flow (DIN 1986)	*576 GPM*	*1684 GPM*	*3600 GPM*
Max. Flow for 100% Capture	*175 GPM*	*240 GPM*	*511 GPM*
Screen Size	*800 Microns*		
Rated Efficiency	*97%*		
Recommended Connection Pipe Type	*SDR 35 PVC*		
D1 : Feed Pipe Diameter	*8"*	*12"*	*16"*
D2 : Filtered Water Accept Pipe Diameter	*8"*	*8"*	*12"*
D3 : Reject Pipe Diameter	*8"*	*12"*	*16"*
H: Filter Height	*25.98"*	*34.09"*	*40.35"*
W: Filter Width	*10.15"*	*12"*	*19.21"*
L: Filter Length	*58.86"*	*70.31"*	*80.43"*
Δh : Feed to Reject Offset Height	*7.48"*	*10.67"*	*13.62"*
H1 :	*16.77"*	*19.64"*	*22.51"*
H2 :	*1.30"*	*2.09"*	*2.12"*
H3 :	*9.67"*	*8.98"*	*8.90"*
b :	*1/2"*		
Filter Weight	*57.2 LB*	*105.6 LB*	*143 LB*

4. Sizing Instructions:

The PURAIN is sized to handle a maximum flow based on European standard DIN 1986. From this flow rate the filter and inlet piping can be sized. From experience, ideal sizing is found using 1 to 2 year interval and 5 minute return rain events for sizing. Sizing using heavier rain events may lead to oversizing, in which case, an emergency bypass is recommended.

Sizing is been done by using local rainfall data which can be found on this like or from NOAA. The table show which filter to use in your geogeopgrahy for any given

roof size. It is important to not disregard local conditions when sizing a filter.

http://ecovieenvironmental.com/wp-content/uploads/2015/08/PURAIN-Rainfall-Intensity-Table.xlsx

There is a maximum amount of water that can be accepted to the cistern through the screen. The rainfall rate at which this flow is achieved can be calculated for various roof sizes as shown below. A greater flow rates than the maximum, hydraulic jump occurs to clean the filter while accept rate increases slowly:

	100% Capture Rainfall Rate (Inches/Hour)		
Roof Size	**DN200 (8")**	**DN300 (12")**	**DN400 (16")**
5,000	3.4	4.6	9.8
10,000	1.7	2.3	4.9
20,000	0.8	1.2	2.5
30,000	0.6	0.8	1.6
50,000	0.3	0.5	1.0
75,000	0.2	0.3	0.7
100,000	0.2	0.2	0.5

5. Optional and Auxiliary Equipment:

a. **Cleaning Shower:** The PURAIN line of filters is designed to be completely self-cleaning with rainwater as is. Unlike other filters which may require cleaning showers to operate at all, the PURAIN filters stay clean without a shower. However, in cases where filter access is difficult or for greywater applications, Intewa offers a cleaning showers which can be operated manually or with an automatic solenoid valve and timer (separate).

b. **Calming Inlet:** A calming inlet is typically used in conjunction with the PURAIN filter in order to comply with ASPE/ANSI 63 rainwater collection guidelines. The calming inlet introduces water to the cistern in a way that aerates the bottom of the tank and also does not disrupt any of the sediment or biofilm in the tank.

c. **Filter Cover:** In cases where the filter is mounted indoors and in an area which cannot get wet, Intewa has a cover for the filter to prevent incidental splashing. The cover has a hatch to allow for inspection.

5. Installation Instructions:

The PURAIN inlet filter can be mounted indoors, or outdoors. It can be mounted inside or outside the rainwater cistern.

EXTERNAL MOUNT

Professional installation of the PURAIN filter is required as a pre-condition for the functioning and durability. This applies to all the phases of installation, right from site preparation, supports, and piping connections.

1. Approach piping requirements:

a. In order to calm water turbulence before entry into the filter, a straight lateral pipe of **at least 10 pipe diameters** is required to maximize water capture efficiency.

b. If the water is coming from a multi-story building, there may be much higher turbulence and a longer lateral or other dissipation method may be required. Consult with project civil engineer for calculations and recommendations is this is the case.

c. Lateral pipe fall should be no more than 1.5%. The lower the fall, the better.

2. **Connections:**

   a. The female pipe connections are sized for SDR 35 PVC pipe. The connection can be easily made with a beveled pipe. Lubricant should not be required, but can be used if desired.

   b. If other pipe sizes are used, then they can be connected to SDR 35 pipe using FERNCO or other transition couplings.

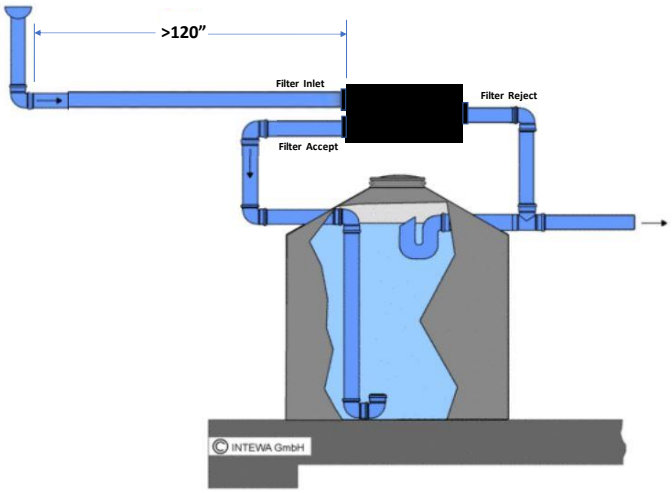
3. **Mounting:**

   a. Please note the weight of the filter in the table above. If full of water, the total weight of the full filter would be much greater, so filter mounting should be able to support this weight.

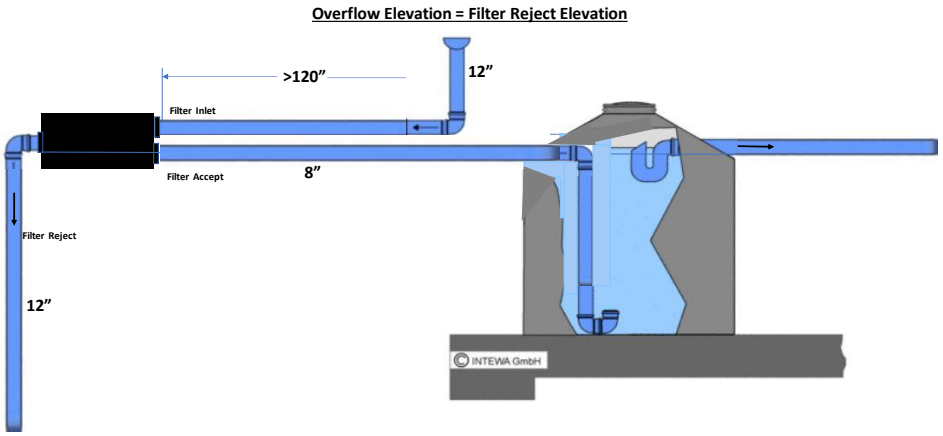
   b. Supports should be placed on each pipe as well as under the filter. The filter can be placed on a platform – concrete or shelf, or can have supports underneath as shown in this installation photo:

DN300 Installation – Note approach piping not as recommended

c. One common way to mount the filter externally is as follows. In this case, the filter reject pipe invert is higher than the tank overflow invert pipe. as shown in the diagram below:



d. An alternate and preferred installation is to mount the filter with the reject pipe invert at the same elevation as the tank overflow pipe invert. This allows some overflow at the filter and may aid in screen cleaning. Using this method requires a solid and water tight bulkhead connection for the 8" filter accept pipe into the rainwater cistern tank.



e. The tank should be installed so that the top and bottom of the filter are level. Installation at non-level conditions could affect capture efficiency or self-cleaning effectiveness.

NOTE: If installation is part of new construction, it is advisable to block flow to the cistern until construction is complete. This will prevent excess mud and sediment from entering the cistern. This may be achieved by wrapping the filter screen in plastic and allow the reject line to flow to sewer.

6. Maintenance:

Your filter requires much less maintenance than other rainwater filters due to the hydraulic jump design and the wedge wire stainless steel filter strainer design. In most cases, the filter never requires any maintenance, although we recommend periodic checks.

1. The filter should be inspected 2-3 times a year for contaminants that may become caught in the slotted wire strainer. To inspect the filter screen, it is not necessary to remove the screen.

2. During inspection, if dirt and leaves are found in the discharge area they do not need not be removed because they will be flushed out through the overflow with the next heavy rainfall.

3. If water has accumulated in the discharge area (highly unusual), the stainless-steel filter screen may be blocked, but this is effectively cleaned in a few seconds by using a hose or a pressure washer simply directed at the screen, again without removing the screen. By doing this, any debris in the 0.8 mm stainless filter strainer can also be effectively removed.

Fig. 16: Automatic cleaning with high pressure cleaner

4. Alternatively, the filter screen can be removed and cleaned in extreme cases which is very unlikely to be needed. In doing so, it is important to clean the screen seating area inside the filter with a hose or other method to flush all dirt out through the emergency overflow before removing the screen. In this way, the clean strainer can be re-installed without dirt and sludge fouling the lateral support guides to ensure a perfect fit and proper seating. Make sure the screen is properly seated after cleaning.

8. Warranty:

The warranty provisions are included in our sales conditions, and can be viewed at:
http://www.intewa.de/1/cs/dialog/rechtliches/verkaufsbedingungen
For any queries, orders for spare parts or service enquiries, please get in touch with your local dealer or visit the service domain at the INTEWA website of your country. Always keep your purchase invoice handy. The US Distributor contact is:
Ecovie Environmental
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