

PRODUCT DATA SHEET

Hydrorock® blocks

Stone wool blocks for water management



Material description

Blocks produced from stone wool for use in water management applications.

Physical characteristics

Parameter	Value			
	D-density 80kg/m ³	HD-density 120 kg/m ³	HDX-density 160 kg/m ³	Unit of measurement
Height (variabel)	33 50 100	33 50 100	33 50 100	Cm
Length	120	120	120	Cm
Thickness	30 40	30 40	30	Cm
Weight H 50 Cm	13,5 17,5	21,5 28,8	28,8	kg/block

Water properties

Parameter	Value			
	D-density 80kg/m ³	HD-density 120 kg/m ³	HDX-density 160 kg/m ³	Unit of measurement
Porosity	96	95	94	%vol
Water permeability	> 200	120	80	m/day
Residual water content	-	3	-	%full

The residual water content is caused by isolated droplets in the rock wool matrix, which are not in capillary contact with most of the water in the buffer. The actual value in practice may vary and depends on the drainage rate. If the drainage is very fast, there will be more isolated droplets in the matrix and the residual water content can be as high as 6%. If the drain is continuously stabilized, the residual water content can even be <1%.

Practical consequences

- During heavy rainfall, water absorption is so fast that special venting facilities are required. Connecting the snorkels must be executed in accordance with the principle details of Hydrorock.
- If the stone wool buffer is only used for buffering water and delayed drainage, so if no infiltration takes place, the bottom 15 cm of the buffer will not drain completely. One should take this into account when calculating the capacity of the system.
- If the amount of rain exceeds the design capacity, other water management solutions will be needed to limit nuisance.

Loadcapacity

Parameter	Value			Unit of measurement
	D-density 80kg/m ³	HD-density 120 kg/m ³	HDX-density 160 kg/m ³	
Creep ¹	5	1,3	0,5	%
Static compressive strength ² (Y Towards 10% moisture)	40 ~3	124 ~12	173 ~17	kPa ton/m ²
E50 (Y Towards 10% moisture)	5	7	8	MPa
Cyclic Modulus ³	15	21	24	MPa

Practical consequences

The systems can be designed for various strengths. Depending on the type of stone wool and the soil conditions, typical installation depths for the various traffic classes are shown in the table below.

Traffic class ⁴ (cyclic / short term)	Installation depth (top from buffer to ground level) ⁵			
	D-density 80kg/m ³	HD-density 120 kg/m ³	HDX-density 160 kg/m ³	Unit of measurement
Green (no traffic)	N/A	>30 (sand)	N/A	Cm
6 tons	70	40	40	Cm
10 tons	N/A	40	40	Cm
15 tons	N/A	60	40	Cm
20 tons	N/A	75	45	Cm

The installation depth consists of the following layers⁶:

- 10 cm paving stones or asphalt
- 25 cm foundation (rubble granulate)
- Variable layer thicknesses of sand

1. Measured by Deltares on cylindrical samples 20 mm high and 63 mm in diameter, in a steel ring. Pressure is 20 kPa over a period of >14 days. The samples are in contact with water [1].
2. Static compressive strength and E-modulus were measured by Deltares according to ASTM D2146 on cylindrical samples with diameter 63 mm and height 130 mm [1.2].

3. The cyclic modulus is derived from the static E50 and is a factor of 3-4 times higher than the static E50. The cyclic modulus of WM2005 of 15 MPa is approximately twice the modulus of EPS 150 [1].
- 4.

Axle load [tons]	Axle load [kN]	(Single)Wheel load [kN]	Wheel print (truck) [m x m]
6	60	15	0,40 x 0,40
10	100	25	0,40 x 0,40
15	150	37,5	0,40 x 0,40
20	200	50	0,40 x 0,40

5. Calculated by Deltares according to the method used for dimensioning elevations on EPS [3].
6. Mixed granulate: 0/31.5 (NEN-EN 13242 (2015) / Standard RAW provision 2015 art. 80.16.05) supply, apply and condense. Sand for Sandbed: Standard RAW 2015 provision 2015 art.22.06.03.

Installation instructions

A number of preventive measures are required to guarantee a long service life:

- Filtering the incoming water. This can be done with special filter vents designed by Hydrorock.
- Because the stone wool blocks are consistently constructed in the same way, the blocks can be adapted to the conditions in the field, even afterwards, without losing the functionality of the system. The blocks can easily be cut; for example, if pipes and cables have to be taken into account.

Preparation work surface

- Although not strictly necessary, proper preparation of the work surface will contribute to the quick and accurate placement of the rockwool blocks.

Stacking

- The blocks are placed vertically, as can be seen in the photos below.



Connections

- The perforated pipe in the blocks for the water supply or serving as a snorkel have a diameter of 100 mm. Standard drainage aids $\varnothing 100$ can be used.

Storage

- The pallets can be stacked up to a maximum of 2 high.
- The pallets are resistant to all weather conditions and can be stored on the construction project in unopened waterproof packaging under all common conditions, also for longer periods.
- Non-flammable - does not cause a fire hazard on the construction site.

Instructions for use

- The most recent manual with installation instructions and the warranty conditions can be downloaded at: www.hydrorock.com

References

- [1] Deltares rapport #11200122-000-GEO-0007, 19 januari 2018
- [2] Deltares rapport #11202897-002-GEO-0003, 20 maart 2020
- [3] CROW (2013). Lichte ophoogmaterialen in de wegenbouw. Publicatie 325. CROW ed., Ede

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