

# INTEWA

## DRAIN-MAX Comb

### DM-27 to 65-60

### DM-27 to 40-30

### DM-27-60-KKA

#### Description

This DRAIN-MAX® System consists of ultra light-weight comb structure with a high load capacity and a 95 % buffering capacity. Compared to gravel the infiltration ditches have 3 times as much storage volume. Depending on the type the combstructure can cope with a load of up to SLW60 (33,3 kN/m<sup>2</sup> - the equivalent of a truck with a load of 60 tons). The structure guarantees a durability for decades. The PP material can be recycled. DRAIN-MAX® comb is neutral against the groundwater, admitted for drinking water applications, UV-, acid/base stabilized. The water can flow freely through the system in all three directions so that the combs can be positioned arbitrarily. At each sidewall there are three openings DN100 which also can be used as inlets. Since the combs can be stacked in layers there is minimal space needed for the installation. The small height of the types DM-27-30 to 40-30 is useful for high groundwater applications.

#### Special features

- 95 % porous – minimal space usage, stackable, simple and quick installation
- Typs DM-27-30 to 40-30 useful for high
- Groundwater applications
- extremely light – weight and portable
- extended durability by using indestructable 100 % recyclable Polypropylene (PP)
- increased load capacity of up to SLW60, TÜV certification
- admitted for potable water applications
- free flow in all three directions
- also suitable for attenuation
- > 20,000 installed INTEWA combs



## Rainwater Infiltration



#### Technical description

##### DRAIN-MAX®

Material: Polypropylen (PP)  
 Size (L x H x B): 2,4 x 0,6(0,3) x 0,33 m  
 Inlets: 3 x DN100  
 On request other sizes possible

Volume (gross): 470 (235) litre  
 Open surface: > 60 %  
 Volume (net): > 95 %  
 Weight: 27 to 65 kg /m<sup>3</sup>  
 depending on the type



#### Accessories

- **S-FK:** Sedimentation- and filtering box
- **S-F pits:** INTEWA Sedimentation and filtering pits in either plastic or concrete
- **GT-150/300:** Filter fabric to cover the DRAIN-MAX systems

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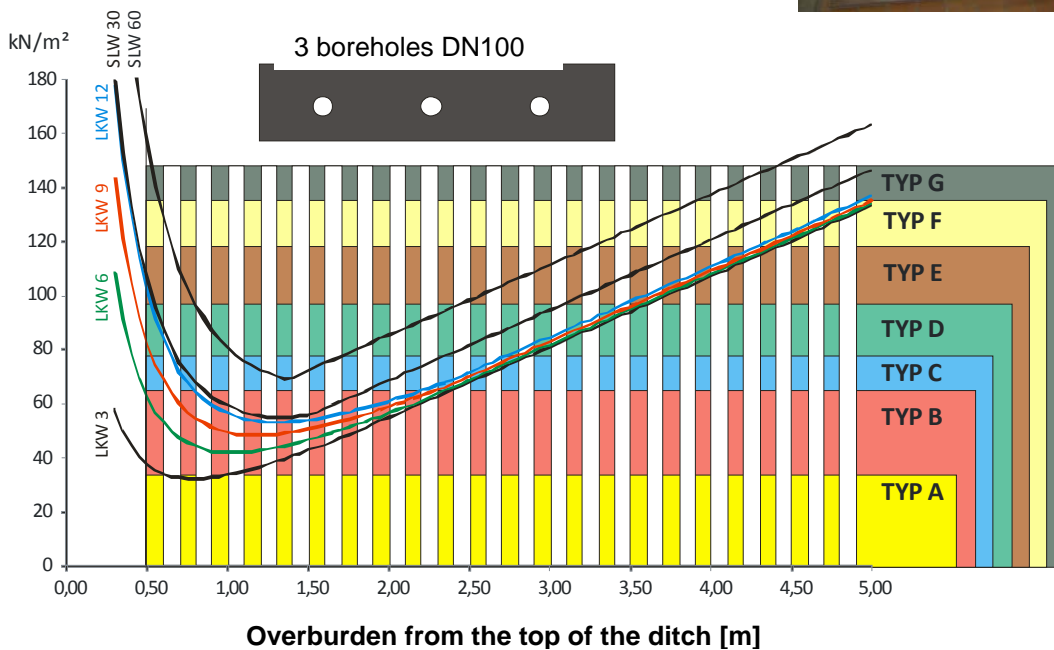
## Load capacity complying with DIN 1072:

TÜV report 2HGD2/2008 from 12/2008

Code	Type	Colour code	Long time Resistance [kN/m <sup>2</sup> ] Vertikal	Long time Resistance [kN/m <sup>2</sup> ] Horizontal
DM27	A	White	33,6	14,0
DM35	B	Green	64,4	23,7
DM40	C	Red	77,3	31,8
DM45	D	Yellow	96,2	40,5
DM50	E	Gold	117,7	50,1
DM60	F	Blue	134,4	69,0
DM65	G	Silver	147,6	83,7

In the following diagram you can find: minimum and maximum overburden in vertical direction for the different DRAIN-MAX combs:

## Rainwater Infiltration



In the below mentioned table you can find: permitted installation depths (bottom level DRAIN-MAX comb) for horizontal resistance:

Vehicle	LKW 3	LKW 6	LKW 9	LKW 12	SLW 30	SLW 60
Equal load [kN/m <sup>2</sup> ]	3	4	5	6,7	16,7	33
Typ A	1,4 m					
Typ B	2,6 m	2,6 m	2,5 m	2,5 m	2,1 m	
Typ C	3,6 m	3,5 m	3,5 m	3,4 m	3,0 m	2,4 m
Typ D	4,6 m	4,5 m	4,5 m	4,5 m	4,1 m	3,4 m
Typ E	5,7 m	5,7 m	5,6 m	5,6 m	5,2 m	4,5 m
Typ F	8,0 m	7,9 m	7,8 m	7,8 m	7,4 m	6,7 m
Typ E	9,5 m	9,5 m	9,5 m	9,5 m	9,1 m	8,4 m

### Example calculation: SLW30, 1 m overburden, 1 layer

1. resulting from diagram: Typ B = DM 35
2. resulting from table with 1 m + 0,6 m = 1,6 m: Typ B with 2,1 m > 1,6 m = ok !

## Installation

### Delivery

The DRAIN-MAX® combs are stacked on pallets and transported to the building site. The DRAIN-MAX can then be offloaded either manually or with a forklift.

Transport and packaging sizes for DRAIN-MAX -60:

pallet (L x B x H) = 2,40 x 1,30 x 2,30 m  
max. pieces = 14 combs  
pallet weight = up to 420 kg  
volume = 6,58 m<sup>3</sup>

lorry = 7,45/14,00 x 2,42 x 2,45m  
max. pieces = 5/10 pallets = 70/140 combs  
volume = 32,9/65,8 m<sup>3</sup>

Small amounts typ DM-29-60 can be shipped (cutted in two parts with 1,2 m each) by parcel service.

### Dimensions

If necessary the DRAIN-MAX® combs can be cutted easily at the building site. For projects individual geometries can be delivered.

### Ground

Before putting the system in place, make sure the surface is even, has enough load capacity and can infiltrate sufficient water.

### High groundwater level

The small height of the types DM-27-30 to 40-30 is useful for high groundwater applications. By DWA rules the groundwater level should be deeper than 1 m from the ditch ground.

### System installation

The DRAIN-MAX® combs are placed in layers. To waste no volume the combs should not interlock each other. Additional connections are completely unnecessary.

### Minimal Installation Costs

The DRAIN-MAX comb system means minimal installation costs in confined spaces unlike gravel infiltration ditches. As the combs are extremely lightweight, they can be carried and installed easily by just one person. As water can flow freely through the system in all three directions, no extra pipes or gravel are needed for installation. Even larger systems can be installed quickly and easily.

### Stackability

Since the combs can be stacked in layers, there is minimal space needed for the installation.



## Installation

### Load Capacity

**Important:** The load capacity specifications refer to light traffic such as car parks or driveways. In areas with continuous, heavy traffic, such as motorways or roads with alternating loads and velocities, special capacity and dimensions are required.

### Pipe connection

Each DRAIN MAX comb has 3 end to end holes DN100, which can be used for the pipes inlet. Bigger inlet diameters should be divided in:

DN150 = 3 x DN100

DN200 = 4 x DN100

DN300 = 9 x DN100

### Pre-filtration/cleaning/maintenance

Stormwater pollutants should never be discharged into local waterways. The regulations for filtering and treatment before discharging the rainwater into the DRAIN-MAX combs are detailed for example in ATV-DVWK M153.

If only connected to roofs, a sedimentation and filter pit is adequate for restraining pollutants. As long as the pollutants are restrained properly, it is unnecessary to monitor the system with a camera or install pipes for additional flushing. If additional flushing is necessary a flushing pipework can be installed easily.

### Ventilation

In small systems and water inlets at the peak of the infiltration ditch, ventilation through the inlet pipe is sufficient. If the inlet pipe is at the bottom of the ditch, a separate ventilation pipe should be installed in the upstream sedimentation pit with a diameter of DN100.

### Filter fabrics/backfilling/compaction

The combs are covered with a filter fabric adapted for the necessary load capacity.

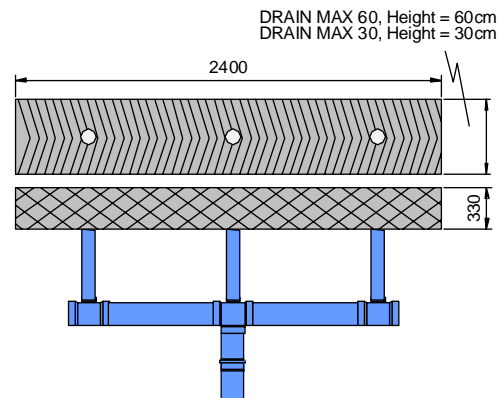
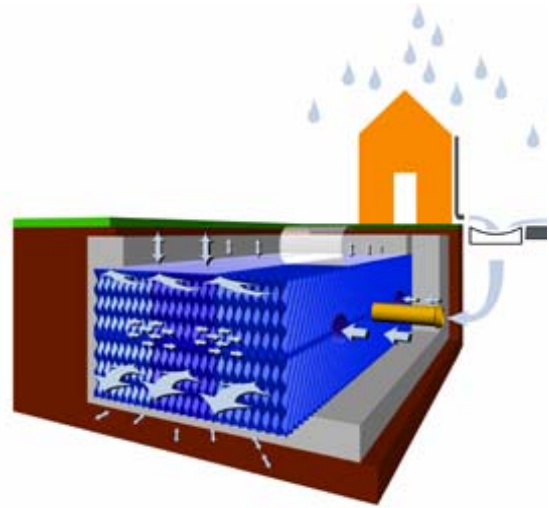
Afterwards the space above the combs can be filled-in and compacted in layers with at least 30 cm with a filling material such as sand gravel, that allows sufficient water infiltration and can be well compacted. Finally the excavated soil can be replaced and relaid to normal ground level.

**Advice:** Vehicles should be permitted only after the minimum installation depth has been covered and compacted.

### Guarantee /operational experiences

More than 20,000 INTEWA DRAIN-MAX comb elements have been successfully used in numerous countries for years. Different references can be viewed at [www.intewa.de](http://www.intewa.de).

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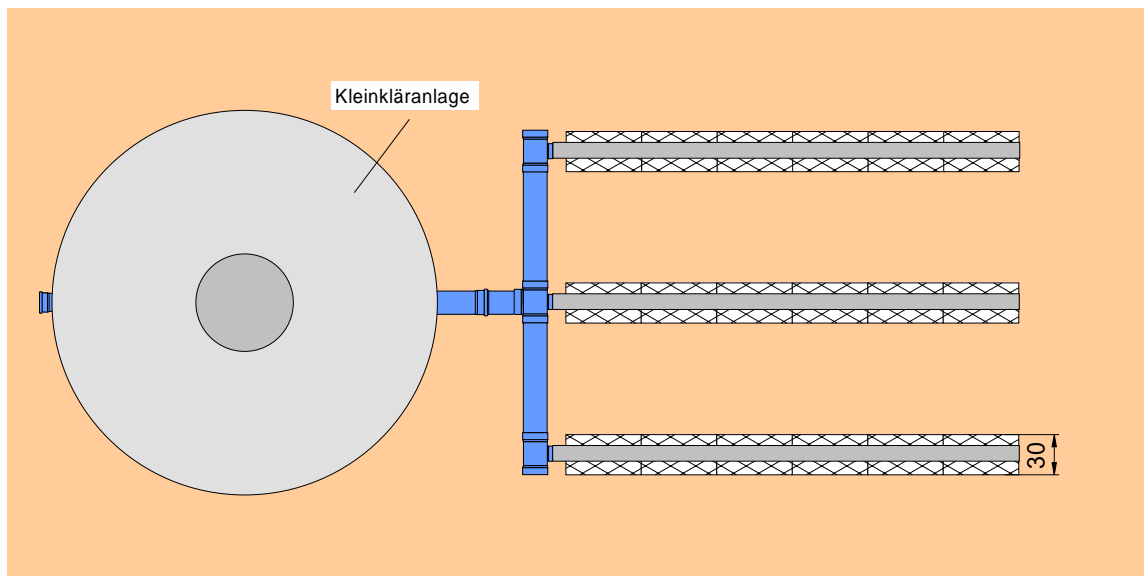


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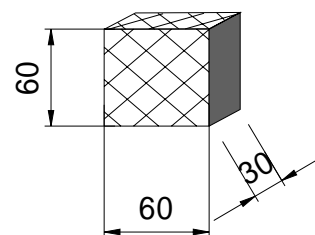
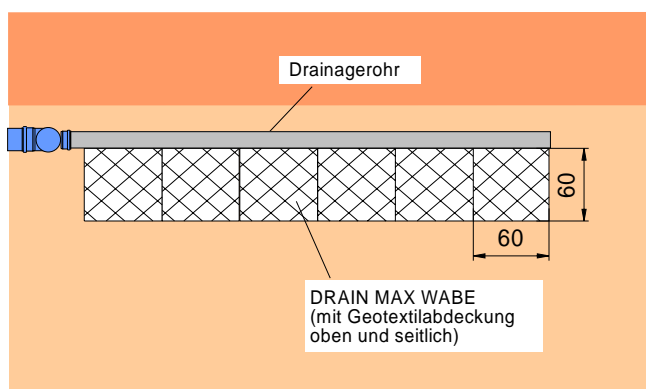
## Infiltration of treated Waste Water

In the past the infiltration of treated waste water has become more and more important. With DRAIN-MAX® comb DM-27-KKA we do offer an optimized product for this kind of application. 8 DRAIN MAX® comb pieces (= one packaging unit) with the size 600 x 600 x 300 mm (L x H x W) offer a maximized open surface for percolation of 5,76 m<sup>2</sup>. The total length of this row is 4,8 m.

Draufsicht:  
Systembeispiel



Seitenansicht:  
Systembeispiel



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