

Strabusil® drainage pipes SN 4 made of PE-HD ...

Strabusil drainage pipes are PE-HD twin-wall pipes (corrugated outside, smooth inside) according to DIN 4262-1 type R2 in ring stiffness class SN 4. The combination of these two properties combines the advantages of the high static strength of corrugated pipes with the high discharge performance of pipes with a smooth inside.

Strabusil drainage pipes are manufactured in 6 m lengths in nominal diameters ranging from DN 100 to DN 400. They are temperature resistant even at sub-zero temperatures. The black colour provides high UV resistance and allows the pipes to be stored outside for longer periods of time.

Strabusil drainage pipes are resistant to acids and bases according to DIN 8075 supplementary sheet 1. Strabusil drainage pipes are used according to relevant standards, guidelines and regulations.

The most important are:

- n DIN EN 1610
- n RAS-Ew
- n DWA-A 139
- n ZTVA-StB 97/06
- n ZTV Ew-StB 14

The perforations are symmetrically arranged along the crown and guarantee optimum water intake thanks to the matched perforation-wall ratio. The perforations are located in the corrugation troughs and protected by a surrounding filter layer so that water can flow freely into the pipe.

Strabusil® – the pipe

- n high infiltration rate thanks to perfectly arranged perforations and low water infiltration resistance
- n push-fit coupling ensures rapid installation. A profile sealing ring seals MP pipes.
- n extremely high degree of drainage thanks to smooth inside
- n high compressive strength and impact resistance thanks to PE-HD twin-wall design
- n easy to install thanks to low weight
- n suited for SLW 60 /HGV60



... tried-and-tested in road and track construction for many years

The perforation area is greater than or equal to 50 cm²/m per pipe. The crown marking of locally perforated pipes ensures the correct installation of Strabusil so that the perforations are located in the upper half of the pipe.

The tried-and-tested twin-wall design gives the pipe a high ring stiffness and a low weight. The smooth surface of the pipe inside ensures unimpeded, rapid discharge of water. Pipe inside and outside are homogeneously welded along

the contact surfaces. The combination of maximum water infiltration and discharge performance, low weight, easy-to-handle 6 m lengths, pliability and high static strength make its use easy and safe and its installation economical.

Strabusil drainage pipes have been designed for the reliable drainage of roads, airfields, sports fields and for cases where increased requirements are placed on drainage pipes.



Its low weight facilitates installation. Matching accessories meet all the demands that are placed on easy-to-install drainage technology.

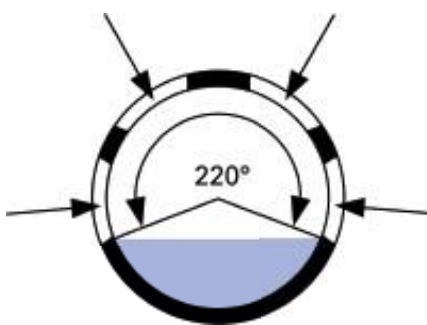
The different types of perforations

Use and function:

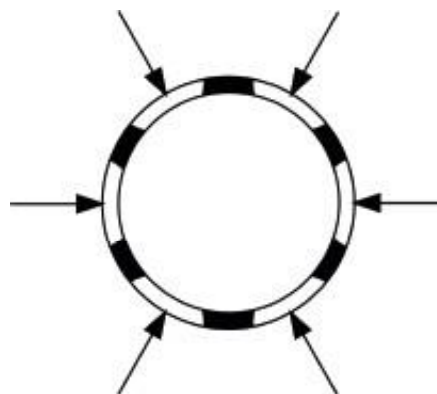
Strabusil locally perforated (LP) and totally perforated (TP) pipes ensure drainage of the ground level and the anti-frost layer. This holds true during and after construction by collecting the accumulating unbound soil water and then transporting it to the receiving waters.

Strabusil multi-purpose pipes (MP) feature both the function of locally perforated pipes and collectors for longer distances. They must store and transport the accumulating surface water if required. As opposed to locally perforated pipes, the coupling connection must provide a watertight (WD) seal according to

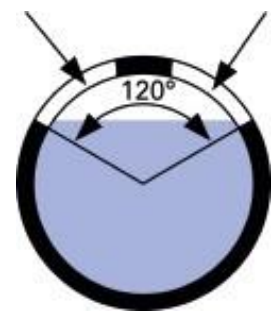
DIN 4262-1. This is achieved by slipping a profile sealing ring into the second corrugation trough. The connection is sandtight (SD) without a profile sealing ring. Make sure that in the case of watertight connections both the coupling inside and the profile sealing ring must be covered with a sufficient amount of lubricant upon installation.



Locally perforated pipe (LP)



Totally perforated pipe (TP)



Multi-purpose pipe (MP)

Strabusil® – high drainage capacity...

Hydraulic properties

The partial capacity curve for circular profiles according to the diagram on the right is used to determine partial discharges according to DWA-A 110.

Key:

d [m] = inside diameter

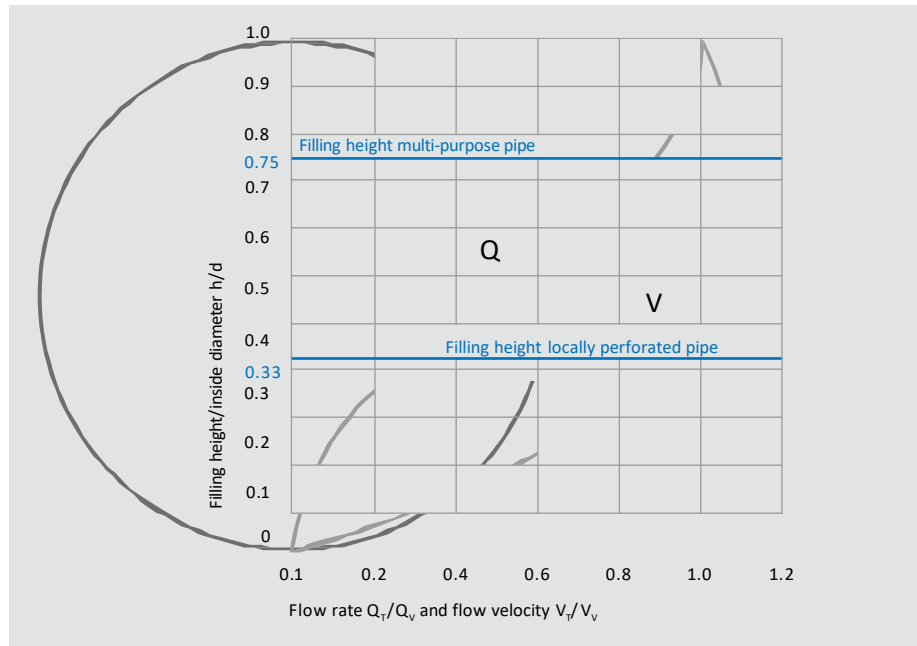
h [m] = filling height

Q_v [m³/s] = flow rate at full capacity Q_T

[m³/s] = flow rate at partial capacity

V_v [m/s] = flow velocity at full capacity

V_T [m/s] = flow velocity at partial capacity

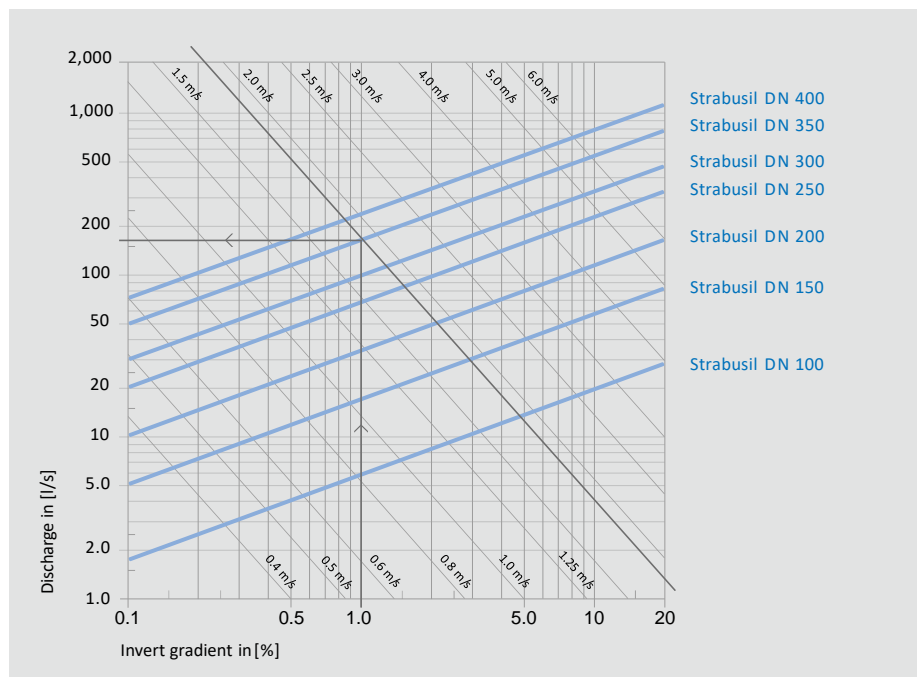


The hydraulic chart can be used to determine the discharge performance (at full capacity).

The hydraulic properties were calculated according to DWA A 110 and are based on a roughness coefficient of $k_b = 0.5$ mm.

The chart shows the discharge (l/s) and flow velocity (m/s) depending on nominal diameter (DN) and invert gradient (%).

If DN 350 Strabusil multi-purpose pipes (MP) are used, a water quantity of approx. 160 l/s or 580 m³/h can be discharged at a gradient of 1% and a flow velocity of approx. 1.8 m/s.



... and excellent robustness guaranteed

Loading

Strabusil drainage pipes are robust and ideal for use in harsh construction site environments. They are impact resistant at sub-zero temperatures.

Strabusil drainage pipes are jetting resistant according to DIN 19523.

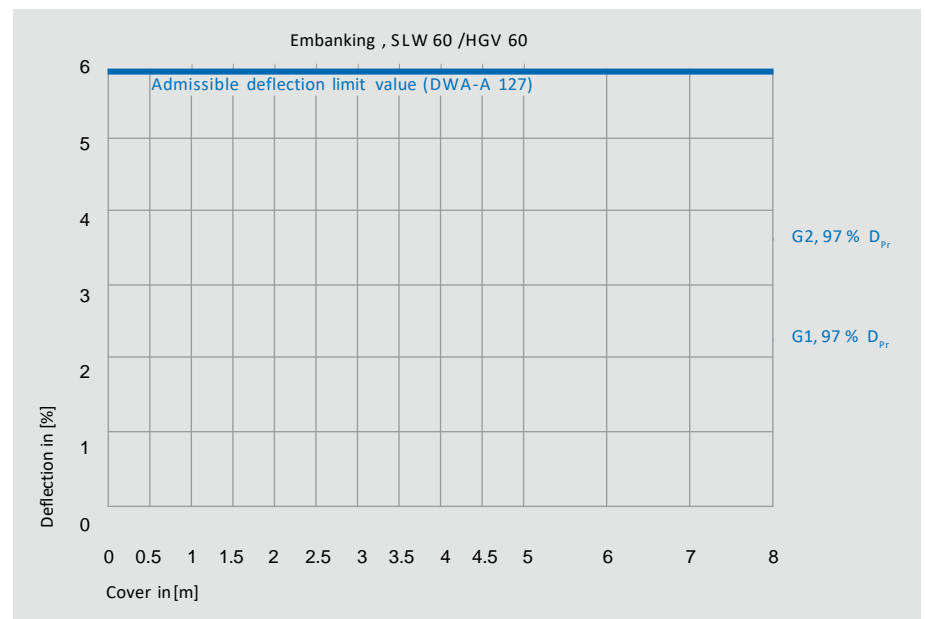
The twin-wall design provides high ring stiffness. They can be used wherever high static and dynamic loads must be absorbed.

If installed according to standards (DIN EN 1610, DWA-A 139), – for standard installations as described below with high traffic loads – the deflection values calculated using the pipe stress analysis (see chart) are not exceeded. The values do not exceed the admissible deflection value of 6.0% according to DWA-A 127.

However, the deflection chart does not replace the project-specific pipe stress analysis according to DWA-A 127. In addition to the deflection analysis, the static verification includes stress and stability analysis.

The following installation conditions apply to the deflection chart on the right (average of all nominal diameters):

- n Strabusil DN 100 – DN 400
- n embanking
- n soil cover 0.5 – 8.0m
- n SLW 60 /HGV 60 trafficloads
- n piping zone – soil of the groups:
 - G2** /slightly cohesive soils (top curve)
 - G1** /non-cohesive soils (bottom curve)
- See also soil class 3 according to DIN 18300; bedding angle 180°, loose bedding.
- n native soil and backfill
 - G3 with 95 % D_{Pr}



Only applies to the installation conditions on the left!

StormPipe – drainage pipes SN 8 made of PE-HD

StormPipe, drainage pipes for demanding requirements in road and track drainage.

StormPipe is made of PE-HD in tried-and-tested twin-wall design. StormPipe complies with DIN 4262-1, R2 pipe type.

The combination of twin-wall design and PE-HD ensures a high ring stiffness of SN 8 according to EN ISO 9969.

StormPipe features a corrugated black outside and a smooth grey inside.

Inside and outside are homogeneously welded along the corrugation troughs.

StormPipe is available in straight lengths of 6 m in nominal diameters DN 100 to DN 600 as totally perforated pipe, locally perforated pipe and multi-purpose pipe.

Thanks to the low weight, StormPipe has many advantages for on-site transportation and installation.

The most important advantages at a glance

- DN 100 – DN 600 as perforated drainage pipe
- ring stiffness SN 8 according to EN ISO 9969
- twin-wall PE-HD pipe, R2 pipe type according to DIN 4262-1
- easy handling thanks to low weight
- inspection-friendly thanks to grey inside
- high infiltration rate of drainage pipes thanks to perfectly arranged perforations and low water infiltration resistance
- extremely high degree of drainage thanks to smooth inside
- suited for SLW 60 /HGV60



High-performance drainage pipes for road and track construction

The perforations are symmetrically arranged along the crown and guarantee optimum water intake thanks to the matched perforation-wall ratio.

The perforations are arranged in the corrugation troughs protected by the surrounding filter layer, which allows best-possible unobstructed water intake.

The pipe stiffness is extremely high.

StormPipe drainage pipes are resistant to acids and bases according to DIN 8075 supplementary sheet 1. They are temperature-resistant also at sub-zero

temperatures and feature high UV resistance. The perforation area is greater than or equal to $50 \text{ cm}^2/\text{m}$ per pipe. The perforation width is $1.2 \text{ mm} + 0.4 \text{ mm}$.

The locally perforated pipes feature a crown marking ensuring correct installation of StormPipe drainage pipes so that the perforations are located in the upper part of the pipe.

Pipe inside and outside are homogeneously welded along the contact surfaces. The combination of maximum drainage and discharge, low weight, easy-to-handle

pipe length, pliability and high static strength make its use easy and safe and its installation economic.

StormPipe drainage pipes have been designed for the reliable drainage of roads, airfields, sports fields and for cases where utmost requirements are placed on drainage pipes.

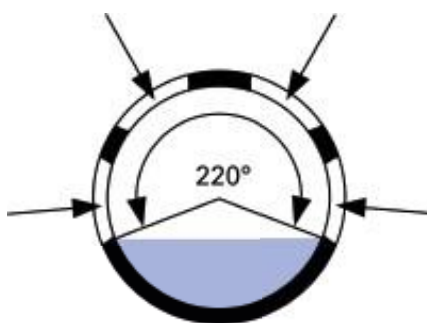
The different types of perforations

Use and function:

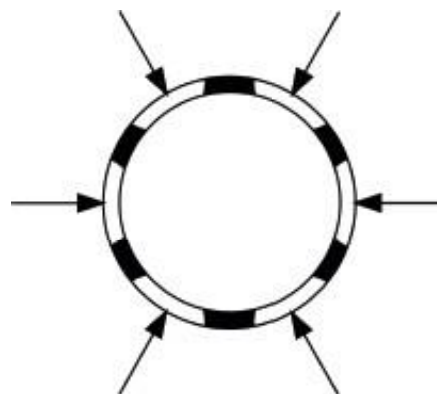
StormPipe locally perforated pipes (LP) and totally perforated pipes (TP) ensure drainage of the ground level and the anti-frost layer. This holds true during and after construction by collecting the accumulating unbound soil water and then transporting it to the receiving waters.

StormPipe multi-purpose pipes (MP) feature both the function of a locally perforated pipe and a collector for longer distances. They must store and transport the accumulating surface water if required. The coupling connection must therefore be watertight (WD) as opposed to locally perforated pipes. This is achieved by

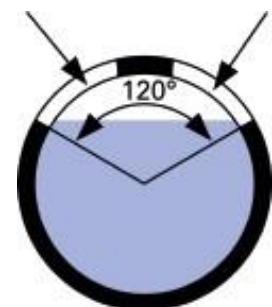
slipping a profile sealing ring into the second corrugation trough. The connection is sandtight (SD) without a profile sealing ring. Make sure that in the case of watertight connections both the coupling inside and the profile sealing ring must be covered with a sufficient amount of lubricant upon installation.



Locally perforated pipe (LP)



Totally perforated pipe (TP)



Multi-purpose pipe (MP)

StormPipe – impresses with excellent hydraulics ...

Hydraulic properties

The partial capacity curve for circular profiles according to the diagram on the right is used to determine partial discharges according to DWA-A 110.

Key:

d [m] = inside diameter

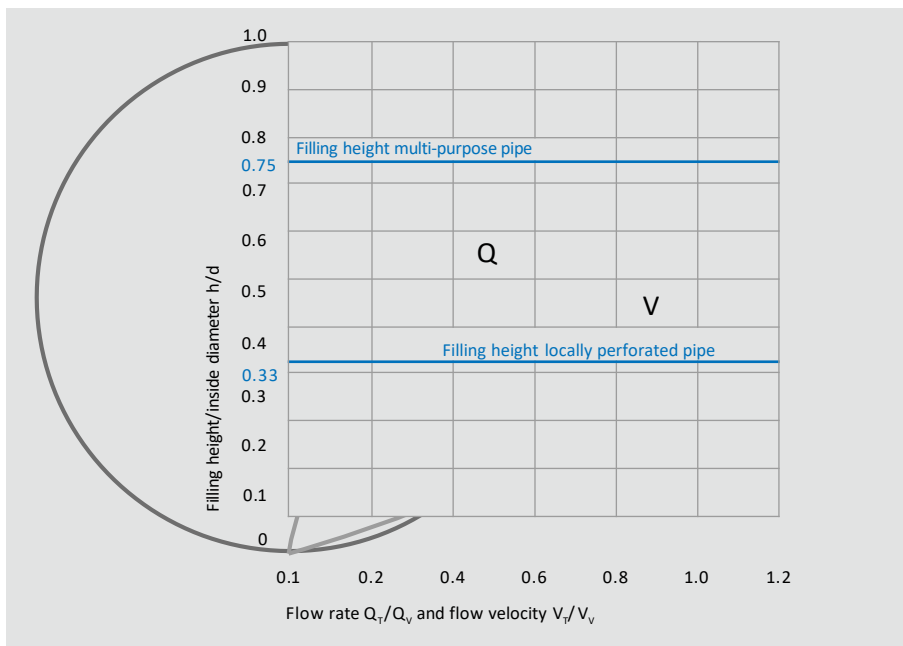
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Q_T [m³/s] = flow rate at partial capacity

V_v [m/s] = flow velocity at full capacity

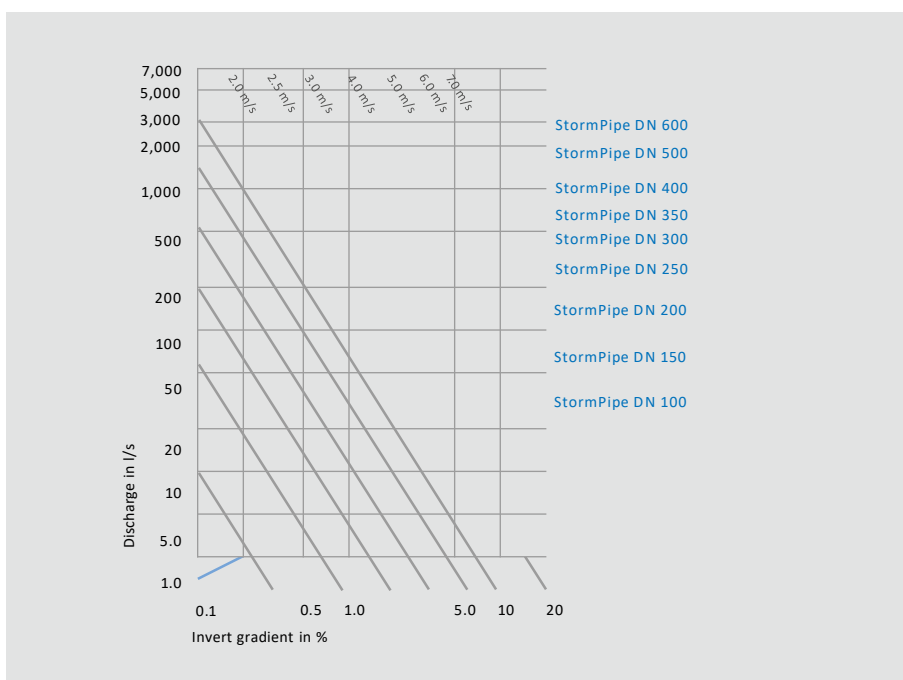
V_T [m/s] = flow velocity at partial capacity



The hydraulic chart can be used to determine the discharge performance (at full capacity).

The hydraulic properties were calculated according to DWA A 110 and are based on a roughness coefficient of ($k_b = 0.5$ mm).

The chart shows the discharge (l/s) and flow velocity (m/s) depending on nominal diameter (DN) and invert gradient (%).



Loading

The high ring stiffness of StormPipe ensures a high degree of reliability. If installed correctly (DIN EN 1610, DWA-A 139), – for standard installations as described below with high traffic loads – the deflection value is significantly below the admissible deflection value of 6.0% according to DWA-A 127. However, the deflection chart does not replace the project-specific pipe stress analysis according to DWA-A 127.

In addition to the deflection analysis, the static verification includes stress and stability analysis.

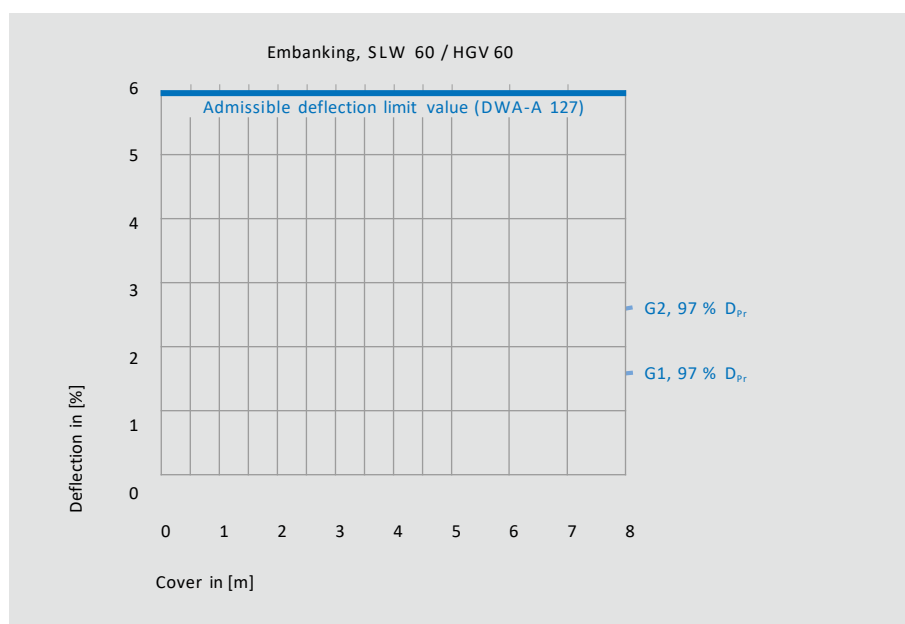
The validity range of the chart complies with the safety factors of 2.5.

The following installation conditions apply to the deflection chart on the right (average of all nominal diameters):

- n StormPipe DN 100 – DN 600
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- n soil cover 0.5 – 8.0m
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- n piping zone – soil of the groups:
 - G2** /slightly cohesive soils (top curve)
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See also soil class 3 according to DIN 18300; bedding angle 180°, loose bedding.

- n native soil and backfill
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