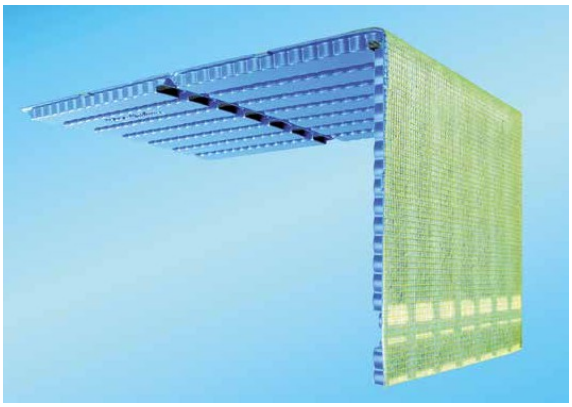
AquaDrain® SD

Technical data sheet

Capillary Passive Step Drainage

For effective drainage of outdoor stairs.



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The combined load-bearing, drainage, filtration and protection system for the installation of outdoor stair coverings.

Application area
For outdoor stairs in private and public areas.

Types of pavement
Suitable coverings are those recommended by the covering manufacturer for the respective area of application and the respective type of covering installation (details in table, p. 3).

Substrates
- Substrates must be level, load-bearing and firm. They must not be springy or compressible.
- Unevenness > 4 mm must be compensated.

Features
- One-piece, capillary-breaking step drainage for treads and butt joints
- Special fleece with mesh fabric laminated on the upper side
- For use with drainage mortar and thin- or medium-bed mortar
- Stairways in connection with larger landings/terrace areas, where drainage of seepage water can also take place via the step construction
- Compensates for the insufficient water drainage capacity of single-grain mortar in the horizontal plane
- Prevents rising accumulated moisture
- Ensures fastest possible drying of pavement and bedding layer
- Bridges puddle formation within the drainage mats
- Temperature resistance: -30 °C to +70 °C

Load capacity
AquaDrain® SD: 2,000 kg/m2

Drainage services
AquaDrain® SD: up to 0.72 l/(m*s) at 1 % slope

System accessories
- AquaDrain® SD Step grid for reinforcement of the bedding mortar
- AquaDrain® UB universal tape, covers joints of adjacent step drainages and corner joints in the joint/step area as well as the connection of the AquaDrain® SD water drainage strip to open stair stringers
- AquaDrain® SD water deflector strip, to prevent seepage water escaping from the sides of free-standing step stringers
- AquaDrain® RD edge insulation strip with SK foot, covers connections to rising components (walls, profiles, etc.), prevents force-fit clamping of the covering
- AquaDrain® SD surface grid, for reinforcement of the laying mortar on AquaDrain® EK drainage for stair landings
- DiProtec® FIX-MSP for fixing the step drainage as an installation aid

Delivery form
AquaDrain® SD step drainage angle element:
Length 1,000 mm, height 180 mm, tread 310 mm, thickness 8 mm

AquaDrain® SD step grating:
Length 1,000 mm, height 140 mm, step 260 mm

Notes on transport and storage
The products must be protected from sunlight and moisture during storage and transportation.

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Technical data sheet

Substrates

Reinforced concrete stairs

Insulations

- Compression-resistant thermal insulation, bonded to the substrate without hollow layers and not resilient or compressible
- Compressive load capacity according to planning specifications

Waterproofing

- All types of waterproofing in accordance with DIN 18531, Parts 1 - 5, are permissible for thick-layer mortar constructions.
  Step-like height offsets > 3 mm in the sealing level must be leveled out beforehand.
- Mineral sealing slurries and liquid plastics in accordance with DIN 18531, Parts 1-5, are permissible for thin-layer mortar constructions. Step-like height offsets and ridges in the waterproofing level must be levelled out beforehand.
- To prevent seepage water from escaping laterally in the case of free-standing step stringers, embed AquaDrain® SD water drainage strip in the 1st layer of brushable waterproofing fresh in fresh at the outer edges of the tread and butt tread, and then apply the water drainage strip in the first layer.
  2. application over the entire surface. If non-liquid waterproofing systems are used, another upstand must be provided on free-standing step stringers to prevent seepage water escaping from the sides.
- AquaDrain® surface drainage meets the requirement for the use of protective layers on waterproofing levels according to DIN 18531-2:2017-07, 5.7 ("Substances for protective layers").
- Separating layers according to DIN 18531-2:2017-07, 5.4 ("Materials for separating layers"), may be required on waterproofing levels, e.g. PE film ≥ 0.2 mm and glass fleece ≥ 150 g/m². AquaDrain® TR, separating layers with integrated grid reinforcement, meet this requirement.

Subsoil slope

Water lenses on the substrate level may only be partially present. To reliably prevent rising moisture into the pavement bedding level (capillary break), the step drains should be 4 mm thicker than the water puddle depth.

- The subgrade slope should be ≥ 1.0%.
- Slope formations > 2.0 % may require slip protection to be dimensioned on site.
- Slope formations < 1% favor standing water on the subgrade:
  - They have higher flatness requirements to eliminate counter slopes.
  - They can have a negative effect on the pavement structure, z. e.g. prolonged moisture stains in natural and artificial stone and frost action in the pavement structure.

Drainage from higher pavement surfaces

Surface water as well as drainage water from higher levels as well as drainage water from low door connections should not be directly be drained into and over the stair structure. Drain grates with independent drainage should be provided at treads.

Processing information

Laying the step drainage

1. Cut AquaDrain® SD step drainage angle elements to fit the step dimension:
   - with 8 -10 mm movement joint to all rising building components,
   - with 2-3 mm joint in the corner joints of the AquaDrain® SD step drainage angle elements from step to step,
   - with 0 -3 mm butt joints between the AquaDrain® SD step drainage angle elements, on a step and to the AquaDrain® water guidance strip.
2. To aid installation, fix the step drainage angle elements to the step area with DiProtec® FIX-MSP using 5 vertical strips per meter.
3. The joints of the step drainage angle elements must be protected against mortar penetration into the drainage level:
   - The AquaDrain® RD edge insulation strip with SK foot must be bonded to the angle element at the movement joints to all rising structural components.
   - The full width (60 mm) of the self-adhesive AquaDrain® UB universal tape must be applied to the corner joints from step to step.
   - Apply the self-adhesive AquaDrain® UB universal tape in half width (30 mm) to the butt joints.

Unprotected step drainage elements should be walked on only on floor boards. Construction site traffic should be excluded.

Laying the covering

The selection of suitable stair tread materials, suitable tread installation and application areas is made according to the following table on p. 3.

Thick film

Treads and risers:

- Cementitious drainage mortars are suitable as laying mortars (e.g. MorTec® DRAIN-ZE) as well as epoxy resin-based drainage mortar (MorTec® DRAIN-EP).
- The drain mortar thickness for risers is at least 20 mm.
- All stair treads must be reinforced with AquaDrain® SD step grids in order to combine the riser and tread into a single unit. The step grid must be embedded in the center of the drainage mortar during installation and overlapped at the sides.
- The required bonding contact layer must be matched to the drainage mortar and surfacing material and applied over the entire surface.
- For MorTec® DRAIN -EP, as well as -ZE, TerraMaxx® PF-FM Fixing Compound is suitable as a bonding layer and should be applied toothed over the entire surface.
- The stair covering materials are laid from the bottom to the top as usual. The use of step clamps is recommended for long-format treads and risers when the treads protrude.
- When laying small-format paving slabs, running boards are required for load distribution on the freshly laid steps

Setting the risers in the medium-bed mortar:

- If treads are uniformly deep, +/- 5 mm, and the mortar bed thickness for setting treads is up to max. 10 mm, setting treads can be laid with shrinkage-compensated, fast-setting medium-bed mortars or TerraMaxx® PF-FM fixing compound.
- Embedding of the step grid in the medium-bed mortar is also carried out centrally and overlapping laterally

Thin film

- The suitable shrinkage-compensated, fast-setting medium-bed mortar is combed onto the drainage system, the step grid is embedded and trowelled over the entire surface.
- Also apply the adhesive mortar over the entire surface of the back of the step covering and lay the covering fresh in fresh.
- As a rule, small-format pavement slabs are laid from top to bottom; with long-format treads and risers, they can be laid from bottom to top.
- Generally, the step grid is filled in and the covering is laid step by step and fresh in fresh. Separate working steps are not permissible in order to avoid disturbances in the mortar structure.

Joints

Pavement joints

- The joints between the upstand and the butt step must always be mortared.
- Because tread surfaces exposed to the sun heat up more than butt tread surfaces, thermally induced hairline cracks may occur between the tread and butt tread. Particularly in the case of dark stair coverings, it may therefore be advisable to additionally rework the mortared joints between the tread and butt joint in the inside corner with elastic jointing materials (MorTec® SOFT).

Movement joints

- They are to be executed according to the rules of technology over the entire pavement cross-section from the top edge of the step drainage angle element to the top edge of the finished pavement.
- Treads including AquaDrain® SD surface grids, if installed, must also be separated from the covering surface with a movement joint.
- For the creation of functional movement joints is available AquaDrain® RD edge insulation strips with SK foot are available for this purpose. Installation is carried out as shown on p. 2 under "Laying the step drainage".

Cladding open side step stringers

- If the step stringers are not already prepared with weather-resistant building boards (as plaster mortar supports), these are usually applied subsequently.
- In the case of direct application of plaster mortar without the use of weather-resistant building boards, hairline cracking is possible. not to be ruled out.

Infiltration or lower drain closure

The seepage water to be discharged from the step system within the drainage layer drains from the lowest riser into an adequately dimensioned drainage layer, e.g. of gravel or into a drainage channel.

Adjacent pavement areas

- Treads made of decking smaller than 800 mm x 360 mm (W x D) must be secured with an additional AquaDrain® SD surface grid over a length of 1.0 m in the decking surface.

Suitable step covering materials and suitable covering installation according to application areas*.

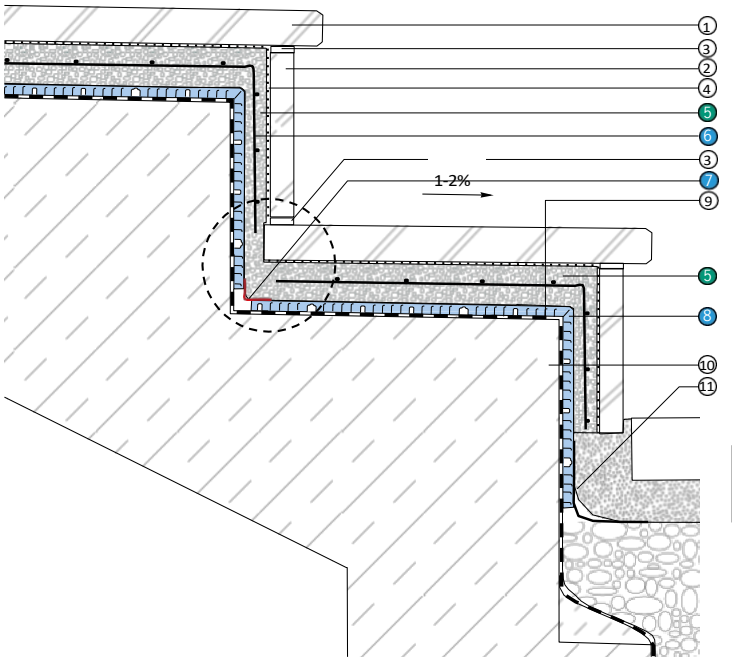
<table>
<tr><td>Drainage system</td><td colspan="2">AquaDrain® SD - Construction method type 1 thick layer</td><td colspan="2">AquaDrain® SD - Construction method type 1 thin layer</td></tr>
<tr><td>Scope</td><td>public area, more than 2 WE</td><td>private area, not more than 2 WE</td><td>public area, more than 2 WE</td><td>private area, not more than 2 WE</td></tr>
<tr><td>Natural stone Treads (≥ 30 mm) and risers (≥ 20 mm)</td><td>x
Tread mortar thickness
≥ 50 mm cementitious,
z. e.g. MorTec® DRAIN-ZE
≥ 25 mm MorTec® DRAIN -EP</td><td>x
Tread mortar thickness
≥ 40 mm cementitious,
z. e.g. MorTec® DRAIN-ZE
≥ 20 mm MorTec® DRAIN -EP</td><td>-</td><td>x
Outlet
depth ≥ 400
mm, width ≥ 800
mm,
Protrusion ≤ 25 mm</td></tr>
<tr><td>Ceramic tiles and slabs, including legs (not florentines), without overhang, with permissible grouting to the adjusting step</td><td colspan="2" rowspan="3">x
Tread mortar thickness
≥ 50 mm cementitious, e.g. MorTec® DRAIN-ZE
≥ 25 mm MorTec® DRAIN-EP</td><td>-</td><td>x min.
10 mm
covering
thickness</td></tr>
<tr><td>Ceramic elements, also legs (no florenti- ners), without protrusion, with permissible mortaring to the setting step</td><td colspan="2">x
min. 20 mm covering thickness</td></tr>
<tr><td>Leg/florenti- ner step plates, etc., which, according to the manufacturer, are equipped with of the adjusting stage must not be mortared</td><td colspan="2">-</td></tr>
<tr><td>Block steps from Natural/concrete stone</td><td colspan="2">x
min. 50 % drainage mortar bedding</td><td colspan="2">-</td></tr>
<tr><td>Angle steps made of natural/concrete stone, according to manufacturer with permissible mortaring the bearing joint</td><td colspan="2">x
min. 50 % drainage mortar bedding</td><td colspan="2">-</td></tr>
</table>

* Step covering materials must be recommended in type and design by the manufacturer for the area of application!
Provided that the type and design of the covering materials allow it, the minimum thicknesses of the covering materials can be undercut for "AquaDrain® SD - Construction Method Type 1 (thick-layer)".

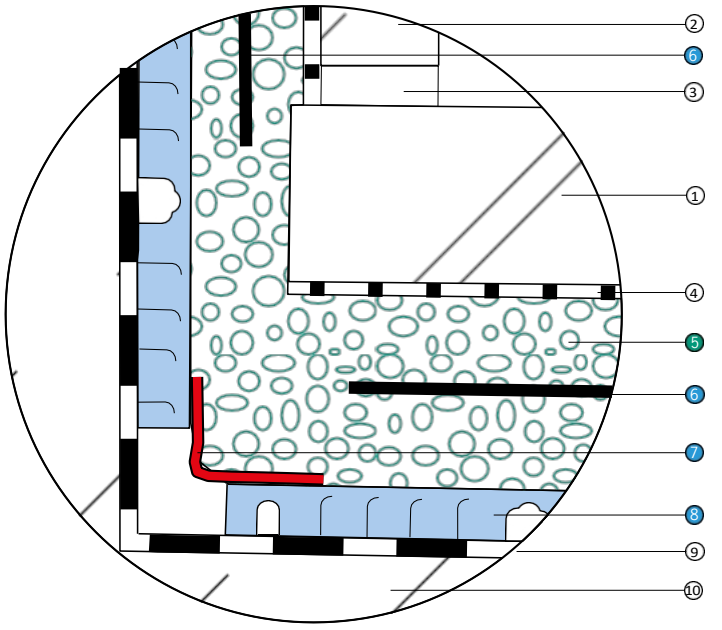
Planning details

Exterior staircase

AquaDrain® SD Step Drainage for Natural/Concrete Stone Stairs

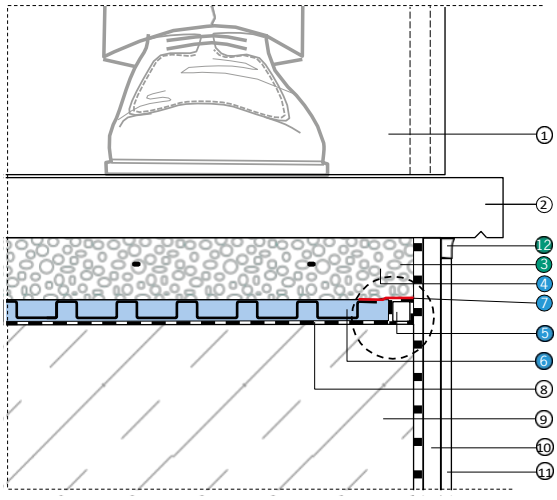


1 Step made of natural/concrete stone in the slope
2 Impact step from natural/concrete stone
3 Butt bonding between tread and butt step
4 Bonding bridge or contact layer, toothed over the entire surface
5 Single grain mortar, e.g. MorTec® DRAIN-ZE
6 AquaDrain® SD Step Grating
7 AquaDrain® UB Universal belt (full width)
8 AquaDrain® SD step drainage, fixed in strips in the butt joint area with DiProtec® FIX-MSP Special sealing adhesive
9 Waterproofing with suitable mineral sealing slurry
10 Reinforced concrete stairs
11 Fleece, water permeable



Detail illustration in scale 1:1

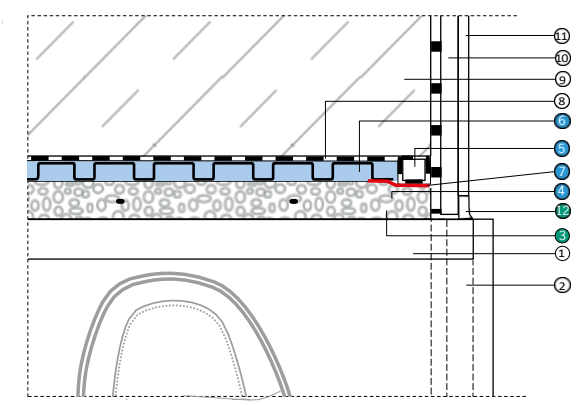
Exterior stair treads



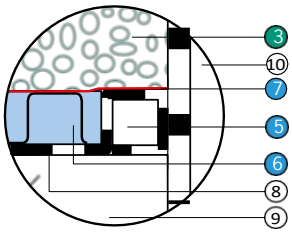
Vertical section through step ("view from front") S e c t i o n right side (1 : 2)

1 Impact step made of natural/concrete stone or ceramic
2 Tread made of natural/concrete stone or ceramics
3 Single-grain mortar, e.g. MorTec® DRAIN-ZE for tread and butt joints
4 AquaDrain® SD Step Grating
5 AquaDrain® SD water drainage strip, bonded and sealed with mineral sealing slurry
6 AquaDrain® SD step drainage (8 mm) laid in the direction of slope, fixed in strips in the butt joint area with DiProtec® FIX MSP special sealing adhesive
7 AquaDrain® UB Universal belt (1/2 width)
8 Waterproofing with suitable mineral sealing slurry
9 Reinforced concrete stairs
10 Weatherproof building panel
11 Exterior plaster layer
12 Elastic joint made of neutrally cross-linking sealant, z. e.g. MorTec® SOFT Detailed view

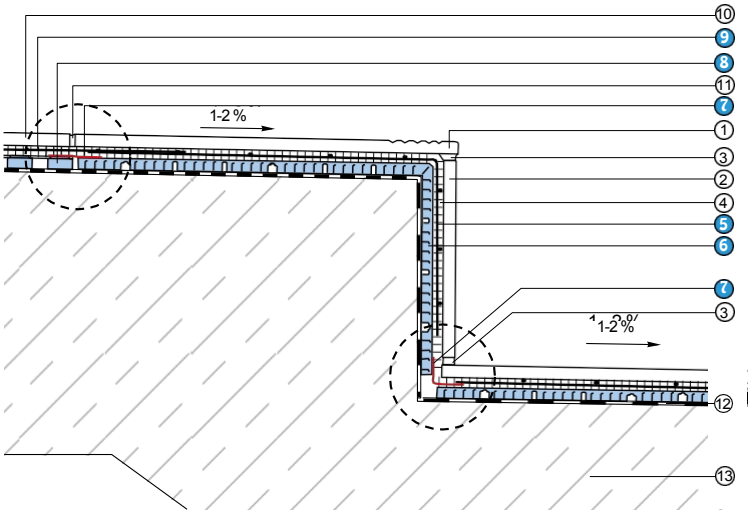
on a scale of 1:1



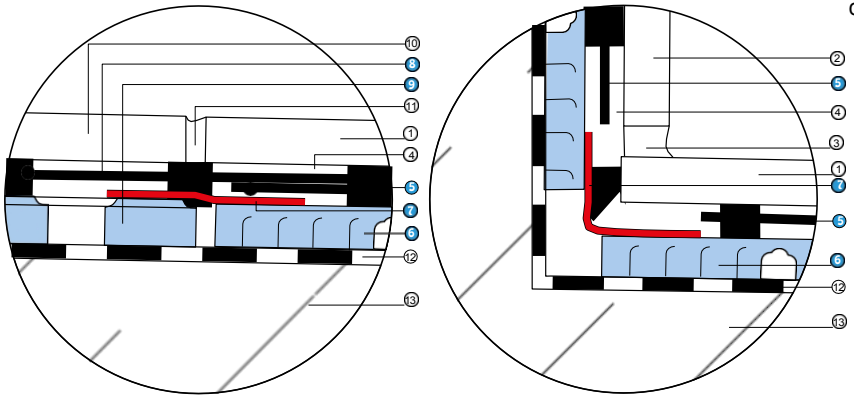
Horizontal section through step (view from above) Section right side (1 : 2)



Fixed ceramic stair coverings, thin layer with AquaDrain® SD step drainage



1 Step made of ceramic
2 Step made of ceramic
3 Butt jointing, cementitious
4 Medium bed mortar
5 AquaDrain® SD Step grid
6 AquaDrain® SD step drainage, fixed in strips in the impact tread area with DiProtec® FIX-MSP special sealing
7 adhesive AquaDrain® UB universal tape (in the surface 1/2 width, in the corner full width)
8 AquaDrain® SD surface grid, one mesh overlapping with step grid Watec® Drain
9 KP+, capillary-passive thin-layer drainage (d = 9 mm)
10 Slabbed ceramic joint, cementitious
11 waterproofing in composite,
12 z. e.g. suitable mineral sealing slurries Reinforced concrete stairs
13

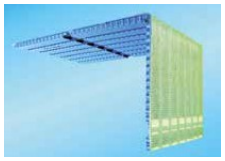


Detail illustrations 1 : 1

Technical data sheet

System accessories

AquaDrain® SD
Step Drainage Angle Element
(8 mm thickness x 310/180 mm)



AquaDrain® SD
Water Guiding Strip
(10 x 10 x 600 mm)

AquaDrain® UB
Universal tape
60 mm wide (2 x 30 mm)

AquaDrain® RD Edge Insulation Strip
with Self-Adhesive foot
80 x 4 x 8 mm (H x W x D)

AquaDrain® SD step
grating (260 x
140 mm)

System components

AquaDrain® SD
surface grid
(1,000 x 1,000 mm)

MorTec®Drain-EP
thin layer Epoxi
drainage mortar

MorTec®Drain-ZE
cementitious
drainage mortar

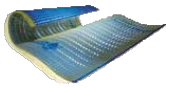
TerraMaxx®PF
contact layer for "fresh
in fesh" embedding

DiProtec®FIX-MSP
Special sealing
adhesive

MorTec®SOFT
Special joint filler with
fine-grained structure

Connection to stain landings

AquaDrain® EK for
pedestals with
drainage mortar



Watec® Drain KP+
for landings with thin-bed or
medium-bed mortar

Material

- AquaDrain® SD step drains are angled elements consisting of channel-like longitudinal and transverse as well as top and bottom profiled, pressure-resistant, non-rotting plastic film (polystyrene) 8 mm thick. The top side consists of a laminated special fleece with integrated mesh fabric.
- AquaDrain® SD step and surface grids consist of a stainless steel grid of mesh size 38/38 mm, material no. 1.4301 (Ø 1.6 mm).

You can find more components for the complete systems you can execute with AquaDrain® SD by scanning the QR code or in the current price list.

The information contained in this technical data sheet is based on our careful investigations and on our experience. The many substances and materials used in the overall construction as well as the different construction site and processing conditions cannot be checked or influenced by us in detail. Expert knowledge, technically correct judgment and correct product use are the basis for permanently functionally reliable construction work. In case of doubt, carry out your own tests or seek technical advice. In addition to the information in this technical data sheet, the relevant rules and regulations of the responsible organizations and trade associations as well as the respective national standards for the service to be provided must be observed. With the publication of this technical data sheet, all previous data sheets lose their validity.

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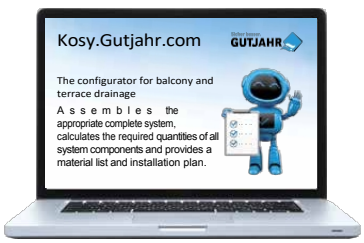
The currently valid versions of the technical data sheets and the current installation instructions can be found at https://www.gutjahr.com/downloads/.



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