MS W TPO A 02.26

Method Statement

KÖSTER TPO/FPO installation on balconies and terraces

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KÖSTER
Waterproofing Systems

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KÖSTER
Waterproofing Systems

1 General information

1.1 Scope

This method statement is intended for use by developers, contractors, and applicators as a general guideline for waterproofing balconies and terraces using KÖSTER TPO/FPO waterproofing membranes. While this document describes the tools, equipment, materials, and step-by-step processes for preparing and installing the waterproofing membrane system, it must be used and referred to in combination with all other relevant technical information available for the material and its components.

1.2 Manufacturer

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KÖSTER
Waterproofing Systems

1.3 Definitions

TPO/FPO
TPO is acronymous for Thermoplastic Polyolefin (FPO = Flexible Polyolefin) and it is a polymer based single-ply membrane that uses thermo-welding (hot air) to connect the seams.

Positive Side Waterproofing
Positive side waterproofing means that the waterproofing layer is applied to the side of the construction member which is in direct contact with water.

Negative Side Waterproofing
Negative side waterproofing means that the waterproofing layer is applied to the side of the construction member which is opposite to the side with direct contact with the water.

Construction Joints:
Concrete structures are subjected to various stresses which result from shrinkage and differential movement. The proper placement of joints in the structure can control these stresses.

Fillets
The concave coving of an interior corner. Stress concentrations are reduced by employing fillets on points and lines of expected high stress.

2 System description

2.1 System features

KÖSTER TPO (thermoplastic polyolefines) are modern and sustainable hot-air-welded polymer membranes. They are made of high-quality flexible polyolefins also known as “FPO”. KÖSTER TPO membranes are based on a mixture of polyethylenes (PE) and functional additives and have an embedded glass fiber reinforcement. These high-quality roofing membranes are characterized by numerous qualities such as the use of uniform material quality on the upper and lower side, high flexibility at extremely low temperatures, (≤ -50°C), the compatibility with bitumen and all insulation materials or the resistance to microorganisms, root penetration and rodent attack. This state-of-the-art recyclable and eco-friendly material constitutes the most recent technology in roofing systems. Colors are white or light grey. Special colors are available on request.

2.2 Characteristics/Advantages

- The waterproofing membrane is made of high-quality thermoplastic polyolefins based on polyethylene (PE)
- Centrally embedded glass fiber mesh
- Uniform material quality (no difference between upper and lower layers)
- Homogeneous seam bonding with hot air welding
- Temperature and weather resistant
- Resistant against normal mechanical stresses
- Aging and rot resistant
- High cold flexibility (≤ -50 °C)
- Eco-friendly system, recyclable
- UV stable
- Resistant to root penetration (FLL certificate)
- Compatible with any type of substrate (concrete, wood, and metal)
- Suitable for all types of insulation (EPS, XPS, PU hard foam, foam glass, and mineral wool)
- Compatible with bitumen and polystyrene
- Free of plasticizers, VOC, softeners, and chlorine
- Weldable indoors – no toxic fumes
- For new structures or the rehabilitation of old structures
- Compatible with any existing coatings or old membranes
- Safe for health, water, soil, and plants
- CE certified, EN 13956 (polymeric roofing membranes), EN 13967 (polymeric sheeting for structural waterproofing)
- Quality assurance certified according to ISO 9001:2008
- Meets SPEC 20.000 – 201/202

2.3 Main products and components

KÖSTER TPO

KÖSTER TPO is a hot-air-welded thermoplastic roofing and waterproofing membrane made of polyolefins (TPO) based on Polyethylene with centrally embedded glass fleece reinforcement. KÖSTER TPO roofing membranes are mechanically fastened to waterproof roofs, balconies, and terraces under a suitable trafficable surface.

KÖSTER TPO 1.5 / 1.8

Product name	Thickness	Length
KÖSTER TPO	1.5 mm, 1.8 mm	20 m

KÖSTER TPO Pro

Similar to KÖSTER TPO in the application, it has no central reinforcement and is uses recycled raw materials, making it an environmentally friendly alternative.

KÖSTER TPO Pro 1.5 / 1.8

Product name	Thickness	Length
KÖSTER TPO Pro	1.5 mm, 1.8 mm	20 m

KÖSTER TPO U

KÖSTER TPO U is an unreinforced homogeneous TPO Membranes used for the creation of custom drainage flanges, corners, and custom details.

KÖSTER TPO 2.0 U

Product name	Thickness	Length
KÖSTER TPO 2.0 U	2.0 mm	20 m

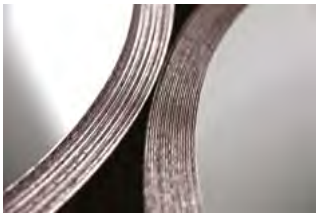
2.4 Associated products

KÖSTER Bar for membrane fastening

See online

KÖSTER Vapor barrier according to DIN 18234

See online



KÖSTER TPO Metal Composite Coil light grey

See online

KÖSTER TPO Metal Composite Sheet light grey

See online

KÖSTER Wall connection profile 60 mm

See online

KÖSTER Edge for wall connection profile 60 mm

See online

KÖSTER TPO 2.0 U

See online

KÖSTER External Corner light grey 90 degrees

See online

KÖSTER Internal Corner light grey 90 degrees

See online

KÖSTER TPO Cleaner

See online

KÖSTER MS Joint Sealant

See online

KÖSTER Emergency Overflow 100*110*490 mm

See online

KÖSTER MS-Flexfolie

See online

KÖSTER KÖSTER TPO Primer for MS Flexfolie

See online

KÖSTER Superfleece

See online

2.5 Associated literature

- Technical Data Sheet TPO 1.5
- Technical Data Sheet TPO 1.8
- Technical Data Sheet TPO Pro 1.5
- Technical Data Sheet TPO Pro 1.8
- Technical handbook KÖSTER Roofing Membranes
- Certificate of conformity of the factory production control 0761-CPR-0423 MPA Braunschweig
- KÖSTER TPO accessory range
- Certificate of conformity of the factory production control 0761-CPR-0422 MPA Braunschweig
- Environmental product declaration (EPD): TPO Pro
- KÖSTER MS-Flexfolie Installation instructions for use with KÖSTER TPO
- KÖSTER TPO system brochure
- KÖSTER TPO installation instructions
- Product Declaration of Performance TPO 1.8
- Product Declaration of Performance TPO Pro 1.8

3 Tools, equipment, and cleaning

3.1 Tools

Measuring tool

Scissors

Knife / Cutter

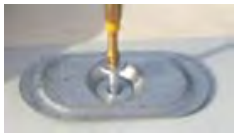
KÖSTER Hand pressure roller 40 mm wide

90° angle pressure roller

KÖSTER Weld Seam Tester

Kehlfix cornering tool

Wire brush



Fastener

3.2 Equipment

Hand welder with wide slot nozzle 40 mm wide

Automatic Welding machine

KÖSTER Special Caulking Gun without extensions

Burnishing machine

3.3 Cleaning

Clean tools and any residues with a cloth or paper towels, oily residue can be removed with KÖSTER Universal Cleaner.

4 Environmental, health and safety

4.1 Personal Protection Equipment (PPE)

The following is a short overview of Personal Protective Equipment and serves only as a guideline. Contractors and Employers are responsible for meeting the occupational safety guidelines in their countries, states, and localities.

Eye protection
Employers must be sure that their employees wear appropriate eye and face protection and that the selected form of protection is appropriate to the work being performed and properly fits each worker exposed to the hazard.

Head protection
Employers must ensure that their employees wear head protection if any of the following apply: Objects might fall from above and strike them on the head; they might bump their heads against fixed objects, such as exposed pipes or beams; or there is a possibility of accidental head contact with electrical hazards.

Foot and Leg Protection
Employees who face possible foot or leg injuries from falling or rolling objects or from crushing or penetrating materials should wear protective footwear.

Hand Protection
When selecting gloves to protect against exposure hazards, always check with the manufacturer or review the manufacturer's product literature to determine the gloves' effectiveness against specific workplace chemicals and conditions. Gloves commonly used are: Coated fabric gloves and Chemical - and Liquid - Resistant Gloves.

Hearing protection
Suitable hearing protection must be provided for the job environment.

4.2 Material safety & First Aid

Every KÖSTER product is labeled with specific information and symbols as to the related dangers. Please consult the respective Material Safety Data Sheet for specifics.

After inhalation:
Not applicable.

After contact with skin:
No special measures are necessary.

After contact with eyes:
Not applicable.

After ingestion:
Not applicable.

Treat symptomatically when indicated so that any immediate medical attention and special treatment can be administered.

4.3 Waste disposal

Disposal recommendations
Dispose of waste according to applicable legislation.

5 Substrate Preparation

5.1 Project site conditions

5.1.1. Application temperature

The KÖSTER TPO Membranes can be securely welded down to 0 °C air temperature. No upper working temperature has been specified; therefore, adjustments of the welding temperature are required according to the existing conditions. If changing conditions occur, new adjustments might be required.

5.1.2. Moisture content

The substrate can be dry or moist. No moisture may be permanently trapped in the structure.

5.2 Requirements

Substrates compatible with the KÖSTER TPO membranes include concrete, mortars, screeds, bricks, masonry, plastic, wood, trapezoidal metal sheets, over existing bitumen or PVC membranes, or almost any other type of material and structure. For further details please contact our technical department.

For direct contact with existing bitumen and PVC membranes, it is advisable to install a separation layer with a geotextile fleece. For further details please contact our technical department or adhere to the product technical guidelines.

5.3 Preparation

In general, no major substrate preparation is needed for this system. The substrate must be as smooth as possible and free of edges, depressions, and other defects that can mechanically damage the membrane.

5.3.1. Leveling and repairing the surface

In the case of honeycombed areas, cavities, recesses, and chipped-out areas, as well as all holes or irregularities deeper than 10 mm, these should be filled flush to reduce risk of puncture. Remove any sharp edges and objects that could also puncture the membrane.

For extra mechanical protection of the membrane on extremely rough substrates, the installation of a geotextile fleece (minimum of 300 g/m^2) on the bottom is recommended before installing the KÖSTER TPO membrane.

5.3.2. Rounding edges

All sharp corners and edges are to be rounded to a radius of approx. 4 cm.

6 Application/Installation instructions

The advantages of using KÖSTER TPO membranes compared to liquid-applied waterproofing systems are significant and numerous. TPO membranes can be installed under almost any weather conditions and do not require curing time; they are immediately waterproof after installation. Common curing-related issues associated with liquid systems, such as bubbling or substrate adhesion failures, are eliminated.

Installation is generally faster and requires less extensive substrate preparation. This results in a more efficient, cost-effective, and reliable application process. Cracks in the substrate are bridged directly, and many joints can be covered without complex detailing.

Detailing work is simplified through the use of prefabricated accessories available in the KÖSTER product range, ensuring consistent quality and reduced installation time.

A wide variety of trafficable surface finishes can be installed above the membrane, including raised tiles over screed or drainage mortar, tiles or paving on pedestal as well as wooden or composite decking systems. Since the finished surface is separated from the waterproofing layer, it can be replaced or renovated without damaging the membrane. Certain systems allow for a level walking surface while maintaining the required slope beneath for proper drainage.

Additionally, the entire assembly can be dismantled and the individual components recycled separately, supporting sustainable construction practices.

Where a combined system is required — for example at floor-level door thresholds or barrier-free access areas — KÖSTER TPO membranes can be seamlessly integrated with KÖSTER MS Flexfolie using KÖSTER TPO Primer for MS Flexfolie and KÖSTER Superfleece, ensuring a secure and compatible transition between systems.

6.1 Types of balconies and terraces

a)

Balcony or terrace equipped with parapet walls for membrane vertical connection /termination

b)

Balcony or terrace equipped with a drip edge and gutter to the drains

6.2 General installation considerations

For a durable and effective waterproofing system using KÖSTER TPO membranes, installation follows a systematic and structured approach. The process begins with thorough surface preparation. The substrate must be clean, dry, and free of contaminants. Any damaged concrete should be repaired using KÖSTER Repair Mortar R4, creating a smooth and stable surface. A minimum slope of 1 – 2% toward the drainage system must be ensured to prevent water accumulation.

A geotextile separation layer must be installed to ensure mechanical protection of the membrane and separate it from existing coatings, floor coverings and old membranes. The KÖSTER TPO membrane is then applied loosely laid with a 5 cm overlap. The overlaps are hot-air welded to create a secure and watertight bond.

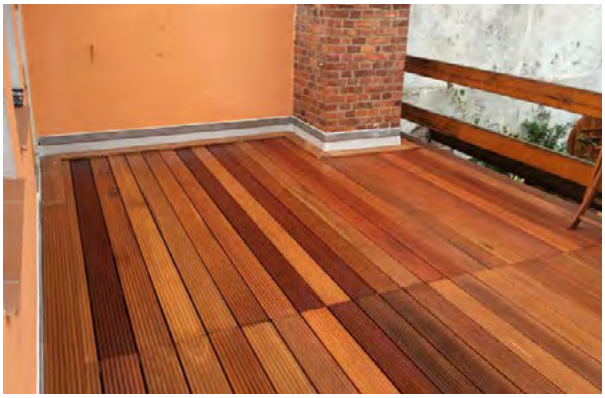
Special attention is given to drainage points and terminations to ensure complete waterproofing integrity. Mechanical fixation is required where the membrane transitions onto vertical surfaces such as walls as well as around drainage pre-fabricated accessories, as well as the protection of the drainage pipes against foliage acumulation, using customized accessories. The KÖSTER catalog provides a comprehensive range of accessories to address specific detailing requirements for balconies and terraces.

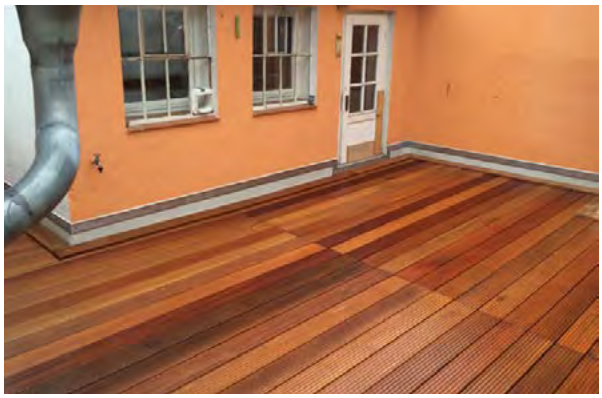
Following membrane installation, a protective layer — such as a geotextile with a minimum weight of 300 g/m² — is placed over the membrane to protect it from mechanical damage.

Finally, the desired flooring / covering systems is installed using a suitable installation method provided by the manufacturer of the system of choice.

This structured installation process guarantees a high-performance waterproofing solution, delivering long-term durability and reliability for balconies and terraces.

- Install edge profile and terminations: Secure metal edge profiles or drip edges to facilitate proper water drainage and fix vertical flashing where needed.
- Welding the seams: Use an automatic hot-air welding machine for long seams and a hand welder for details.
- Detailing and upstands: Install an additional piece of membrane vertically, extending at least 15 cm up walls or parapets, and overlapping horizontally by 11–20 cm. Secure it with termination bars for a watertight seal.
- Install drains and penetrations: Seal around drains and pipe penetrations using KÖSTER TPO accessories.
- Protection and Wooden Deck Installation: Lay a geotextile protection fleece over the KÖSTER TPO membrane to prevent damage from the wooden deck supports.
- Install support structure for the wooden deck: Use pedestals or a subframe system that does not puncture the membrane. Ensure adequate ventilation and drainage beneath the wooden deck.



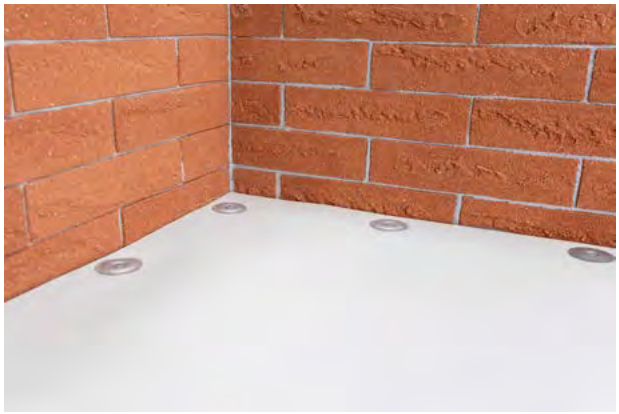


6.3 Intallation instructions

Step 1 – Preparing the substrate, cutting and positioning the KÖSTER TPO Membrane

- Install a protection fleece to mechanically protect the KÖSTER TPO membrane over the properly prepared substrate with the minimum slope towards the drains.
- Measure and cut the KÖSTER TPO membranes to fit the required sections, allowing for overlaps (5 cm).
- Lay out the membrane loosely over the prepared substrate without wrinkles or tension.
- Align membrane accurately at the fence upstand to allow for proper overlap with the vertical membrane installation.

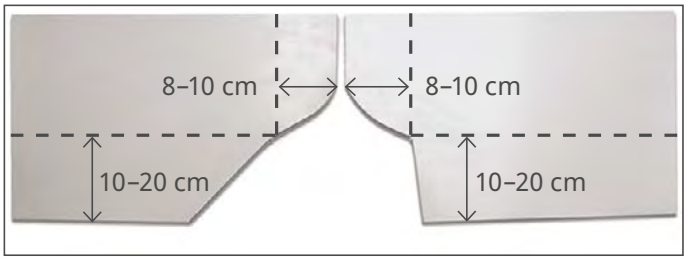
Step 2 – Mechanical Fixing of the KÖSTER TPO Membrane

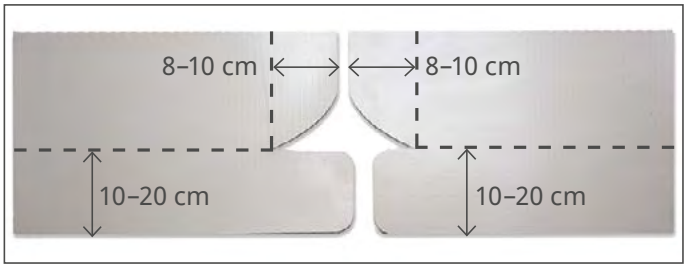


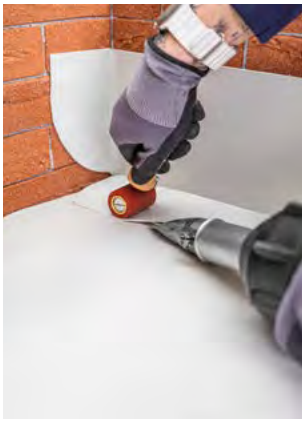
- Position fastening sleeves through the KÖSTER TPO membrane on the perimeter of the balcony / terrace, distancing 1 cm from the edge of the membrane and mechanically anchor into the structural substrate using approved fasteners.
- Mechanically secure the horizontal KÖSTER TPO membrane to the substrate. Ensure uniform fastener distribution and proper seating of fastening components to prevent membrane deformation. Verify secure anchorage prior to proceeding with vertical membrane installation.
- Fastener type, embedment depth, and spacing must comply with project specifications and wind load requirements.

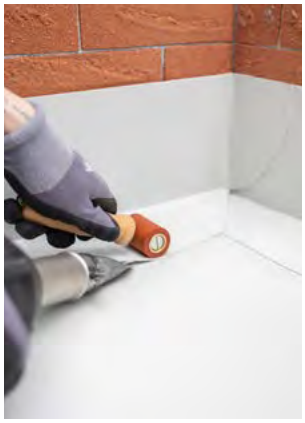
Step 3 – Vertical installation of the KÖSTER TPO Membrane

- Install vertical KÖSTER TPO membrane along the upstand and connect it to the membrane horizontally laid on the floor.
- The connection strips of KÖSTER TPO membrane, must have a minimum width of 25 to 30 cm (minimum 10 cm for horizontal and 15 cm for vertical). Ensure proper alignment and maintain minimum overlap dimensions with the horizontal membrane as specified. The stripes and connection membrane must be free of wrinkles and properly tensioned.
- The vertical membrane shall extend to minimum height and overlap the horizontal membrane sufficiently to allow for heat welding seam of 5 cm. Ensure substrate compatibility and adequate mechanical support where required.
- Corners should be made with two-part connection strips. The cuts are made according to the illustration. For corner protection prefabricated 90-degree KÖSTER inside and outside corners are used. The cutting pattern also applies to the formation.










- Secure the KÖSTER TPO membranes overlapping seams properly through hot-air welding using manufacturer-approved welding equipment and adhere to the temperature and testing reccomendations. Maintain consistent welding temperature, speed, and pressure to achieve a homogeneous weld. Perform seam checks to confirm continuous bonding without voids or cold welds.

Step 4: Installation of KÖSTER TPO Inside and Outside Corners


Install new accessories such as drains and gutters. For this KÖSTER TPO Metal Composite Sheet can be cut and worked as an attachment for the KÖSTER TPO and serve as a drip edge.

Step 5: Installation of the KÖSTER Wall Connection Profile


- Position the KÖSTER Wall Connection Profile at the top edge of the vertical TPO membrane.
- Pre-drill fixing points as required and mechanically fasten to the structural element using corrosion-resistant fasteners at specified intervals.
- Ensure the termination profile is level, continuously supported, and securely fastened. The profile must provide mechanical restraint and protection to the upper membrane edge.

Step 6: Application of the KÖSTER MS Joint Sealant

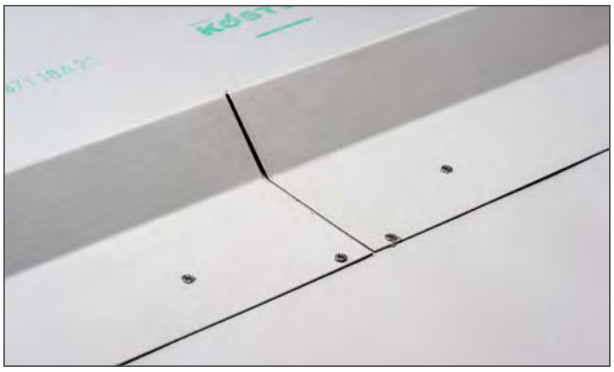
- Apply the KÖSTER MS Joint Sealant continuously along the top edge of the metal termination profile to prevent water ingress behind the membrane. Apply a tape to protect top section of the wall during the sealant application.
- Use a tool sealant bead to ensure correct distribution and smooth finish. Inspect for continuity and eliminate gaps or air pockets. Final assembly must provide a durable, watertight termination detail.

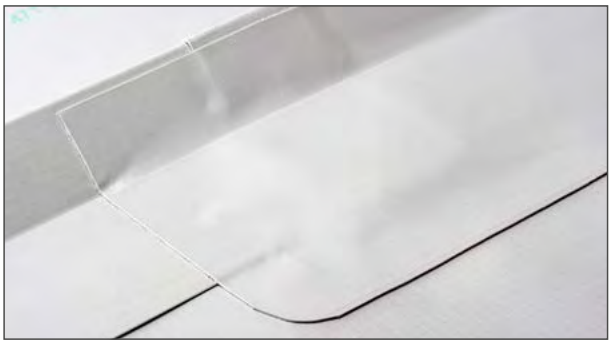
Full view

Completed TPO waterproofing assembly at balcony/terrace fence interface. The horizontal and vertical fleece-backed TPO membranes are fully integrated. All overlaps are hot-air welded, internal and external corners are reinforced, and the metal termination profile is mechanically secured and sealed to provide a continuous, water-tight system in accordance with manufacturer specifications.

6.4 Connection to KÖSTER TPO Metal Composite Sheet

KÖSTER TPO Metal Composite Metal Sheet are used for custom details such as drip edges, flashing, or wall connections. The TPO membrane can be directly connected to the metal sheet by welding. Where the sheets are butted together, they are connected with strips of KÖSTER TPO U at least 10 cm wide. This is then completely welded.





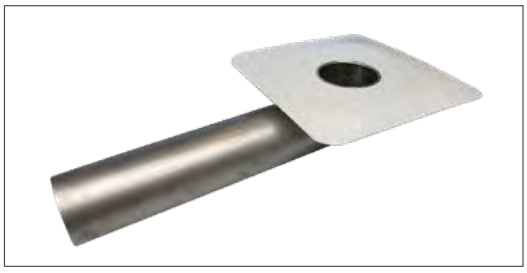
6.5 Connection to a rain gutter

The waterproofing must be installed so that no raised areas are created. Rainwater must be able to flow unrestricted. The membrane is directly welded to the TPO coated metal sheet.

6.6 Terrace or balcony drainage

KÖSTER recommends using gullies with factory-fitted KÖSTER TPO flanges. They should be fastened mechanically with the membrane. Roof gullies with extension elements are used for roofs with insulation. When using clamp flange gullies, the manufacturer's instructions must be observed. Roof drains are recessed into the insulation to guarantee unrestricted water flow. According to the Flat Roof Guideline they must be positioned at least 30 cm from an upstand.

KÖSTER Roof Drain with TPO Flange



6.7 Emergency overflow - Attica spouts

Various drains are available for drainage/emergency overflow through the parapet. KÖSTER TPO U sleeves are welded to the rigid polyethylene flanges.

Emergency overflow

Emergency overflow

Attica drainage

Gutter

6.8 Quality control

The Installer should be trained in the welding and processing of thermoplastic membranes. On-site welding tests must be carried out every day to determine the correct welding parameters. The settings must be checked and re-adjusted if necessary, when conditions change. The seam is to be checked with a peel and shear test on an approx. 5 cm wide weld seam sample. The seam should not be separable. The leading edge of the seam must also be checked! Important: The test sample must be completely cooled down before the test! If the welding samples are of poor quality, the welding parameters such as temperature, speed, pressure, and air volume must be adjusted. If waterproofing membranes are welded later, for example at connections, welding tests must be carried out with the already installed KÖSTER TPO membranes. If the welding results are not satisfactory, it may be necessary to clean the installed membranes in the weld area or to roughen them mechanically. The seam inspection of the installed membrane should happen >24 hours after welding and is carried out with a KÖSTER Weld seam tester. Ideally, the temperature of the membranes should be approximately +20 °C.

6.9 Connection of KÖSTER TPO Membranes with KÖSTER MS-Flexfolie

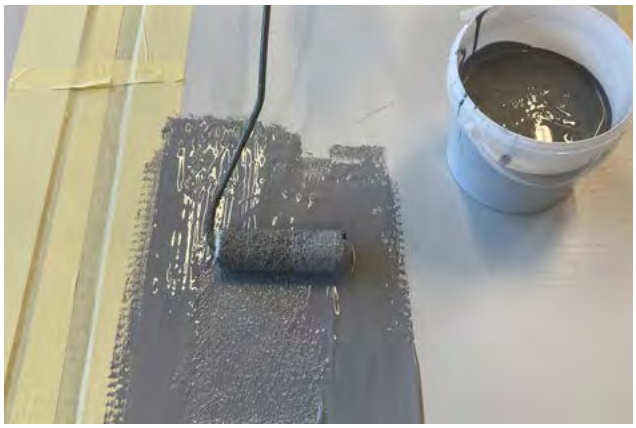
Complex details, penetrations, and connections to floor level door elements can be waterproofed with KÖSTER MS-Flexfolie.
For most materials, a pre-treatment with a primer/ undercoat is required. The following products are used: KÖSTER TPO Primer (RT 109 001) for MS-Flexfolie, KÖSTER MS-Flexfolie (W 200 008), KÖSTER PU Primer 120 (J 138 250), and KÖSTER TPO Cleaner (RT 105 002).

In the case of certain substrates, the surface must also be sanded. A very thorough roughening must be carried out, especially in the edge areas. For this generally a 40 grit sandpaper is used.

When connecting KÖSTER TPO to various substrates, the proper primer must be selected. For example, when connecting KÖSTER TPO to sheet metal, the KÖSTER TPO is cleaned when necessary with KÖSTER TPO Cleaner and primed with KÖSTER TPO Primer for MS-Flexfolie. The metal side is thoroughly cleaned.

Another example is when connecting to a window or door frame, the KÖSTER TPO is cleaned when necessary with KÖSTER TPO Cleaner and primed with KÖSTER TPO Primer for MS-Flexfolie. The frame is sanded and primed with KÖSTER PU Primer 120.

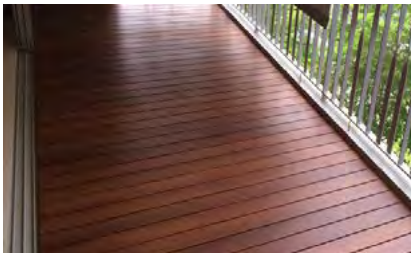
All transition areas are reinforced with KÖSTER Superfleece. The KÖSTER Superfleece is embedded into the fresh first layer of KÖSTER MS-Flexfolie, and completely covered with a second layer.



6.10 Choice of final traficked surface

A suitable trafficable surface is required, as KÖSTER TPO is not suitable as a constantly trafficked surface. There are several options such as wooden decking, tiles, or paving stones set on adjustable pedestals. It must be guaranteed that pressure from the decking is properly distributed over the KÖSTER TPO, either by using a Geotextile or extra pieces of KÖSTER TPO under the pressure points.

Tiles over screed or drainage mortar



Wood or plastic lumber planking

Tiles or paving on pedestal

7 Transport and storage

The KÖSTER TPO waterproofing membranes are frost-proof and generally insensitive to the weather and may be stored outdoors on construction sites even in adverse weather conditions (down to -10 °C). However, it is recommended not to remove any transport packaging such as shrink hoods or stretch films as a protective layer. The storage and transport of the rolls should always be done standing on a pallet. Lying storage and transport leads to the deformation of the rolls and can make the laying and welding of the membranes difficult. Do not stack pallets. It must be ensured that the goods are not soiled or damaged during storage. For this purpose, opened pallets should be covered with foil. When installing the membranes in winter, the rolls should be stored in heated or closed rooms.

8 General notes

8.1 Material storage

Store TPO roofing membrane rolls standing upright, covered with a breathable tarp, and protected from moisture, chemicals, and extreme temperatures.

8.2 Important considerations

- This method statement is intended for use as a general guideline for the installation of the referred system and must be adapted to suit the local conditions, standards, and specifications, as well as special requirements.
- Testing the suitability of the material and equipment for the intended use is strongly recommended before commencing work.

8.3 Limitations

Special conditions may require alterations to these recommendations; therefore, a warranty can only be given for the quality of the products but not for the correct usage or the workmanship of the materials.

9 Certifications

KÖSTER TPO certificates

- EPD-KBC-20160014-IBC1-DE Environmental Product Declaration according to the ISO 14025 and EN 15804
- Official Test Report according to 1200/057/15 DIN EN 13956 MPA Braunschweig, Official Test Report according to 5278/015/14 DIN EN 13967 MPA Braunschweig, Certificate of conformity of the factory production control 0761-CPR-0422 MPA Braunschweig, Fish test A14-02548 BMG Zürich, Official Test Report according to ETAG 006 4/2015 I.F.I. Aachen

KÖSTER TPO Pro certificates:

- Certificate of conformity of factory production control 0761-CPR-0422 MPA Braunschweig
- Certificate of conformity of factory production control 0761-CPR-0423 MPA Braunschweig
- EPD-KBC-20210162-IBC1-DE Environmental Product Declaration according to the ISO 14025 and EN 15804+A2

10 Appendix

CE 0761 15	**KÖSTER BAUCHEMIE AG** **Dieselstraße 1-10, 26607 Aurich** **KÖSTER TPO 1.5** **EN 13956 0761-CPR-0422** **EN 13967 0761-CPR-0423** **TPO (PE) roofing and waterproofing membrane with central glass fleece insert**	
Length according to DIN EN 1848 2	20 m	
Width according to DIN EN 1848 2	2.10; 1.50; 1.05; 0.75; 0.525; 0.35; 0.25 m	
Effective thickness according to DIN EN 1849-2	1.5 mm	
	DIN EN 13956: 2012 waterproofing of flat and sloped roofs. Application by loose laying with ballast or mechanical fastening	**DIN EN 13967:2012 Vapor Barrier Type T**
Designation according DIN SPEC 20000-201 and DIN SPEC 20000-202	DE/E1-FPO-BV-E-GV-1,5	BA-FPO-BV-E-GV-1,5
Color	light grey	light grey
Visible Defects according to DIN EN 1850 2	free from visible defects	free from visible defects
Straightness according to DIN EN 1848-2	≤ 50 mm	≤ 50 mm
Flatness according to DIN EN 1848-2	≤ 10 mm	
Mass per unit area according to DIN EN 1849-2	1490 g /m²	1490 g /m²
Water tightness according to DIN EN 1928 (Method B)	400 kPa/24h watertight	400 kPa/72h watertight
Exposure to liquid chemicals, including water according to DIN EN 1847	passed (Method B)	watertight (Method A)
Exposure to external fire according to DIN CEN/TS 1187; DIN 4102-7; DIN EN 13501-5	Broof(t1)[1]	-
Reaction to fire according to EN 13501-1	Class E	Class E
Resistance to hail according to DIN EN 13583		
Rigid substrate	≥ 25 m/s	-
Soft substrate	≥ 38 m/s	
Peel resistance of the overlap according to DIN EN 12316-2	≥ 500 N/50 mm	-
Shear resistance of the overlap according to DIN EN 12317-2	Failure beyond the overlap	Failure beyond the overlap
Water vapor diffusion resistance according to DIN EN 1931	μ – 85,000; Sd – 127.5 m	μ – 85,000; Sd – 127.5 m
Tensile characteristics according to DIN EN 12311-2		
Tensile strength	≥ 6 N/mm² (Method B)	≥ 6 N/mm² (Method B)
Elongation at break	≥ 500 % (Method B)	≥ 500 % (Method B)
Resistance to shock loads according to DIN EN 12691		
Method A	> 500 mm	> 500 mm
Method B	≥ 1000 mm	≥ 1000 mm
Resistance to static loading according to DIN EN 12730		
Method A	≥ 20 kg	≥ 20 kg
Method B	≥ 20 kg	≥ 20 kg
Tear continuation resistance according to DIN EN 12310-2	≥ 175 N	≥ 175 N
Root penetration resistance [2]	given	-
Dimensional stability according to DIN EN 1107-2	≤ 0.2 %	≤ 0.2 %
Folding at low temperatures according to DIN EN 495 5	≤ - 50 °C	-
Behavior under UV irradiation, elevated temperatures, and water according to DIN EN 1297 (1000 h)	passed: Level 0	
Ozone resistance according to DIN EN 1844	passed	-
Exposure to bitumen according to DIN EN 1548	passed	watertight
Durabilty against heat storage according to DIN EN 1296, DIN EN 1928 (Method A)	watertight	watertight
Tear resistance (nail shank) according to DIN EN 12310 1	≥ 500 N	≥ 500 N

1) Requirements are met for roofs tested by KÖSTER in Germany. Further information can be requested from KÖSTER. 2) Applies only to green roofs

CE 0761 15	**KÖSTER BAUCHEMIE AG** **Dieselstraße 1-10, 26607 Aurich** **KÖSTER TPO 1.8** **EN 13956 0761-CPR-0422** **EN 13967 0761-CPR-0423** **TPO (PE) roofing and waterproofing membrane with central glass fleece insert**	
Length according to DIN EN 1848-2	20 m (65' 7 3/8")	
Width according to DIN EN 1848-2 metric	2.10; 1.50; 1.05 m	
Width according to DIN EN 1848-2 standard	6'10 5/8", 4'11 5/8", 3'5 3/8"	
Effective thickness according to DIN EN 1849-2	1.8 mm (71 mil)	
	DIN EN 13956: 2012 waterproofing of flat and sloped roofs. Application by loose laying with ballast or mechanical fastening	**DIN EN 13967:2012 Vapor Barrier Type T**
Designation according DIN SPEC 20000-201 and DIN SPEC 20000-202	DE/E1 FPO BV E GV 1,8	BA FPO BV E GV 1,8
Color	light grey	light grey
Visible Defects according to DIN EN 1850-2	free from visible defects	free from visible defects
Straightness according to DIN EN 1848-2	≤ 50 mm (1 7/8")	≤ 50 mm (1 7/8")
Flatness according to DIN EN 1848-2	≤ 10 mm (3/8")	
Mass per unit area according to DIN EN 1849-2	1740 g /m² (5.7 oz/ft²)	1740 g /m² (5.7 oz/ft²)
Water tightness according to DIN EN 1928 (Method B)	400 kPa/24h watertight	400 kPa/72h watertight
Exposure to liquid chemicals, including water according to DIN EN 1847	passed (Method B)	watertight (Method A)
Exposure to external fire according to DIN CEN/TS 1187; DIN 4102-7; DIN EN 13501-5	Broof(t1)[1]	-
Reaction to fire according to EN 13501-1	Class E	Class E
Resistance to hail according to DIN EN 13583		
Rigid substrate	≥ 25 m/s (56 mph)	-
Soft substrate	≥ 40 m/s (89 mph)	
Peel resistance of the overlap according to DIN EN 12316-2	≥ 400 N/50 mm (46 lb/in)[2]	-
Shear resistance of the overlap according to DIN EN 12317-2	Failure beyond the overlap[2]	Failure beyond the overlap[2]
Water vapor diffusion resistance according to DIN EN 1931	μ = 85,000; Sd = 153 m	μ = 85,000; Sd = 153 m
Tensile characterisitcs according to DIN EN 12311-2		
Tensile strength	≥ 7 N/mm² (Method B) (1015 psi)	≥ 7 N/mm² (Method B) (1015 psi)
Elongation at break	> 500 % (Method B)	> 500 % (Method B)
Resistance to shock loads according to DIN EN 12691		
Method A	≥ 500 mm (19.7")	≥ 500 mm (19.7")
Method B	≥ 1000 mm (39.4")	≥ 1000 mm (39.4")
Resistance to static loading according to DIN EN 12730		
Method A	≥ 20 kg (44 lbs)	≥ 20 kg (44 lbs)
Method B	≥ 20 kg (44 lbs)	≥ 20 kg (44 lbs)
Tear continuation resistance according to DIN EN 12310-2	≥ 200 N (45 lbs)	≥ 200 N (45 lbs)
Root penetration resistance[3]	given	-
Dimensional stability according to DIN EN 1107-2	≤ 0.2 %	≤ 0.2 %
Folding at low temperatures according to DIN EN 495-5	< - 50 °C	-
Behavior under UV irradiation, elevated temperatures, and water according to DIN EN 1297 (5000 h)	passed: Level 0	-
Ozone resistance according to DIN EN 1844	passed	-
Exposure to bitumen according to DIN EN 1548	passed	watertight
Durabilty against heat storage according to DIN EN 1296, DIN EN 1928 (Method A)	watertight	watertight
Tear resistance (nail shank) according to DIN EN 12310-1	≥ 500 N (112.4 lbs)	≥ 500 N (112.4 lbs)

1) Requirements are met for roofs tested by KÖSTER in Germany. Further information can be requested from KÖSTER.
2) Value measured under laboratory conditions in accordance with EN 12316-2 and EN 12317-2. In addition to the product properties, the peel value depends on the processing and the construction site environment. It is essential that the shear value test results in a break outside the joint seam (also under construction site conditions).
3) Applies only to green roofs

CE 0761 15	**KÖSTER BAUCHEMIE AG** **Dieselstraße 1-10, 26607 Aurich** **KÖSTER TPO Pro 1.5** **EN 13956 0761-CPR-0422** **EN 13967 0761-CPR-0423** **FPO (PE) roofing and waterproofing membrane made of flexible Polyolefin with central glass fleece insert**	
Length according to DIN EN 1848-2	20 m	
Width according to DIN EN 1848 2	1,50 m	
Effective thickness according to DIN EN 1849-2	1,5 mm	
	DIN EN 13956: 2012 waterproofing of flat and sloped roofs. Application by loose laying with ballast or mechanical fastening	**DIN EN 13967:2012 Vapor Barrier Type T**
Designation according DIN SPEC 20000 201 and DIN SPEC 20000-202	DE/E1 FPO BV E GV 1,5	BA FPO BV E GV 1,5
Color	white	white
Visible Defects according to DIN EN 1850-2	free from visible defects	free from visible defects
Straightness according to DIN EN 1848 2	≤ 50 mm	≤ 50 mm
Flatness according to DIN EN 1848-2	≤ 10 mm	
Mass per unit area according to DIN EN 1849-2	1490 g /m²	1490 g /m²
Water tightness according to DIN EN 1928 (Method B)	400 kPa/72h watertight	400 kPa/72h watertight
Exposure to liquid chemicals, including water according to DIN EN 1847	passed (Method B)	watertight (Method A)
Exposure to external fire according to DIN CEN/TS 1187; DIN 4102-7; DIN EN 13501-5	Broof(t1)[1]	-
Reaction to fire according to EN 13501-1	Class E	Class E
Resistance to hail according to DIN EN 13583		
Rigid substrate	≥ 25 m/s	-
Soft substrate	≥ 38 m/s	
Peel resistance of the overlap according to DIN EN 12316-2	≥ 400 N/50 mm	-
Shear resistance of the overlap according to DIN EN 12317-2	Failure beyond the overlap	Failure beyond the overlap
Water vapor diffusion resistance according to DIN EN 1931	μ = 85.000	μ = 85.000
Tensile characterisitcs according to DIN EN 12311-2		
Tensile strength	≥ 5 N/mm² (Method B)	≥ 5 N/mm² (Method B)
Elongation at break	≥ 350 % (Method B)	≥ 350 % (Method B)
Resistance to shock loads according to DIN EN 12691		
Method A	≥ 400 mm	≥ 400 mm
Method B	≥ 1000 mm	≥ 1000 mm
Resistance to static loading according to DIN EN 12730		
Method A	≥ 20 kg	≥ 20 kg
Method B	> 20 kg	> 20 kg
Tear continuation resistance according to DIN EN 12310-2	≥ 175 N	≥ 175 N
Dimensional stability according to DIN EN 1107-2	≤ 0,2 %	≤ 0,2 %
Folding at low temperatures according to DIN EN 495-5	≤ - 30 °C	-
Behavior under UV irradiation, elevated temperatures, and water according to DIN EN 1297 (1000 h)	passed: Level 0	-
Ozone resistance according to DIN EN 1844	passed: Cracking level 0	-
Exposure to bitumen according to DIN EN 1548	passed	watertight
Durabilty against heat storage according to DIN EN 1296, DIN EN 1928 (Method A)	watertight	watertight
Tear resistance (nail shank) according to DIN EN 12310 1	≥ 400 N	≥ 400 N

1) Requirements are met for roof structures tested by KÖSTER in Germany. Information on this is available from KÖSTER.

CE 0761 19	**KÖSTER BAUCHEMIE AG** **Dieselstraße 1-10, 26607 Aurich** **KÖSTER TPO Pro 1.8** **EN 13956 0761-CPR-0422** **EN 13967 0761-CPR-0423** **FPO (PE) roofing and waterproofing membrane made of flexible Polyolefin with central glass fleece insert**	
Length according to DIN EN 1848-2	20 m	
Width according to DIN EN 1848-2	1,50 m	
Effective thickness according to DIN EN 1849-2	1,8 mm	
	DIN EN 13956: 2012 waterproofing of flat and sloped roofs. Application by loose laying with ballast or mechanical fastening	**DIN EN 13967:2012 Vapor Barrier Type T**
Designation according DIN SPEC 20000-201 and DIN SPEC 20000 202	DE/E1-FPO-BV-E-GV-1,8	BA-FPO-BV-E-GV-1,8
Color	white	white
Visible Defects according to DIN EN 1850-2	free from visible defects	free from visible defects
Straightness according to DIN EN 1848-2	≤ 50 mm	≤ 50 mm
Flatness according to DIN EN 1848-2	≤ 10 mm	
Mass per unit area according to DIN EN 1849-2	1780 g /m²	1780 g /m²
Water tightness according to DIN EN 1928 (Method B)	400 kPa/72h watertight	400 kPa/72h watertight
Exposure to liquid chemicals, including water according to DIN EN 1847	passed (Method B)	watertight (Method A)
Exposure to external fire according to DIN CEN/TS 1187; DIN 4102-7; DIN EN 13501-5	Broof(t1)[1]	-
Reaction to fire according to EN 13501-1	Class E	Class E
Resistance to hail according to DIN EN 13583		
Rigid substrate	≥ 25 m/s	-
Soft substrate	≥ 38 m/s	
Peel resistance of the overlap according to DIN EN 12316-2	> 300 N/50 mm[2]	-
Shear resistance of the overlap according to DIN EN 12317-2	Failure beyond the overlap[2]	Failure beyond the overlap[2]
Water vapor diffusion resistance according to DIN EN 1931	μ – 85.000	μ – 85.000
Tensile characterisitcs according to DIN EN 12311-2		
Tensile strength	≥ 5 N/mm² (Method B)	≥ 5 N/mm² (Method B)
Elongation at break	≥ 350 % (Method B)	≥ 350 % (Method B)
Resistance to shock loads according to DIN EN 12691		
Method A	≥ 400 mm	≥ 400 mm
Method B	> 1000 mm	> 1000 mm
Resistance to static loading according to DIN EN 12730		
Method A	≥ 20 kg	≥ 20 kg
Method B	≥ 20 kg	≥ 20 kg
Tear continuation resistance according to DIN EN 12310-2	≥ 175 N	≥ 175 N
Dimensional stability according to DIN EN 1107-2	≤ 0,2 %	≤ 0,2 %
Folding at low temperatures according to DIN EN 495-5	≤ - 30°C	-
Behavior under UV irradiation, elevated temperatures, and water according to DIN EN 1297 (5000 h)	passed: Level 0	-
Ozone resistance according to DIN EN 1844	passed: Cracking level 0	-
Exposure to bitumen according to DIN EN 1548	passed	watertight
Durability against heat storage according to DIN LN 1296, DIN LN 1928 (Method A)	watertight	watertight
Tear resistance (nail shank) according to DIN EN 12310-1	≥ 400 N	≥ 400 N

1) Requirements are met for roofs tested by KÖSTER in Germany. Further information can be requested from KÖSTER.
2) Value measured under laboratory conditions in accordance with EN 12316-2 and EN 12317-2. In addition to the product properties, the peel value depends on the processing and the construction site environment. It is essential that the shear value test results in a break outside the joint seam (also under construction site conditions).

11 Legal disclaimer

This method statement reflects general cases with standard parameters. It is not suitable as a step-by-step guide for all and each waterproofing project as the conditions on site at the moment of the application cannot be foreseen. It is solely the applicator's responsibility to decide on the actual procedure considering the specific situation on the construction site. In any case, KÖSTER's Terms of business are valid and can be viewed under www.koster.eu