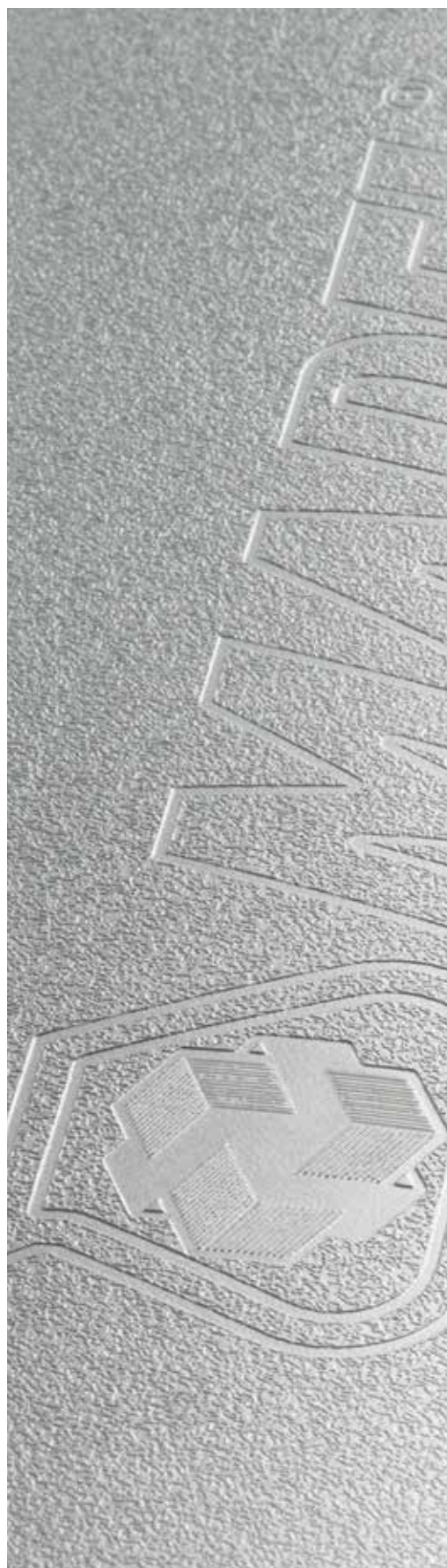


Use, inspection and maintenance

SYNTHETIC WATERPROOFING MEMBRANES MAPEPLAN T FPO/TPO





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1. Introduction - Foreword

Roofs require regular maintenance to ensure the waterproofing system keeps performing at its peak and retains its properties in the long term.

Generally, each country has its own standards and rules for the correct maintenance of roof waterproofing systems and you must refer to these standards/rules to ensure the correct ongoing management of your roof system. In Italy, for example, a specific technical standard has been introduced, attesting to the importance of maintenance: UNI 11540:2014 *"Guideline for the drafting and right implementation of the maintenance program of continuous roofing made with flexible sheets for waterproofing"*.

This standard provides useful information on defining up and implementing a routine maintenance plan for continuous roofing produced using flexible waterproofing membranes.

The standard comprises a number of parts:

- a) Roof user guide. This contains information aimed at users to help them understand how best to use membrane.
- b) Maintenance manual. This contains the information needed to maintain the roof correctly.
- c) Maintenance schedule. This contains information on the maintenance inspection stages and relevant intervals in order to maintain the roof correctly over the course of its service life.

The roofing system Designer is tasked with drawing up the maintenance manuals and schedule.

This document prepared by Polyglass SpA provides information to help you use and maintain MAPEPLAN T waterproofing membranes and roofing systems correctly. This information can be used as a foundation for preparing a more comprehensive and specific inspection and maintenance schedule to be drawn up by the Designer.

2. General information - Exposed roofs

The “exposed” roofing system options with FPO flexible polyolefin waterproofing membranes are:

- MAPEPLAN T M waterproofing membrane, for loose-laid systems with mechanical fixing
- MAPEPLAN T Af and MAPEPLAN T B waterproofing membranes, for adhered systems.

MAPEPLAN T M, MAPEPLAN T Af and MAPEPLAN T B waterproofing membranes are formulated to withstand full exposure to the elements and UV rays.

They do not require coatings or any other surface protection, meaning the only specific maintenance this type of roofing generally requires is standard inspection and cleaning.

3. General information - Ballasted and protected roofs

The “ballasted and protected” roofing system options with FPO flexible polyolefin waterproofing membranes are:

- MAPEPLAN T B waterproofing membrane, for systems ballasted with gravel
- MAPEPLAN T B waterproofing membrane, for systems ballasted with floating paving
- MAPEPLAN T B waterproofing membrane, for systems ballasted with paving designed to take foot traffic
- MAPEPLAN T B waterproofing membrane, for systems ballasted with paving required to carry vehicle loads
- MAPEPLAN T B waterproofing membrane, for systems ballasted with roof gardens and green roofs.

MAPEPLAN T B waterproofing membranes are used to produce ballasted and protected roofs and are formulated to withstand the stress encountered under the ballast (gravel, slabs, screed, paving, roof gardens, etc.), though they are also formulated to withstand full exposure to the elements and UV rays.

The areas of the waterproofing membrane covered and protected with ballast are no longer accessible, while areas that are left exposed, if any, do not require coatings or other surface protection of any kind, meaning the only specific maintenance this type of roofing generally requires is standard inspection and cleaning.



4. Maintenance agreement

The job of installing continuous roofing with synthetic waterproofing membranes involves specialist work, meaning specific expertise and equipment are required to lay and maintain the membranes correctly. Consequently, we advise the Owner and/or Manager of the building to take out an inspection and scheduled maintenance agreement directly with the Specialist Waterproofing Company.

5. Roof access

Roof access must be granted only to authorized personnel who have received suitable training and instruction and have been advised on the hazards and risks encountered on the roof.

The roof must always be accessed in full safety, in compliance with all current accident-prevention regulations. To avoid falls from heights, suitable collective protective equipment must be provided (parapets, scaffolding, etc.) and/or, as an alternative, personal protective equipment (anchor points, life lines, safety harnesses, etc.) must be used.

All personnel accessing the roof must be issued with suitable PPE for the task at hand.

6. Accessibility / walkability - Exposed roofs

MAPEPLAN T M, MAPEPLAN T Af and MAPEPLAN T B waterproofing membranes used in fully exposed systems can take foot traffic and be accessed for maintenance purposes only, either to be performed on the membranes in question and/or on any machinery and building services that might be found on the roof.

If the roof is home to building services and machinery that require periodic maintenance or cleaning, we recommend producing walkways using concrete pavers laid on supports, or applying a specific MAPEPLAN T WALKWAY protective membrane with a structured surface to give all operators a safe preferential access route to follow.

When walking directly on the waterproofing membrane, special footwear must be worn, both for your own safety and to avoid damaging the membrane in question.

When using cleated sole footwear, we strongly advise you always to check that no fine gravel or other abrasive material has accidentally stuck to or become lodged in the sole before walking on the waterproofing membrane to avoid the risk of scraping or piercing the membrane in question.

If you are gaining access to a roof in driving rain or if the roof has pooling water or is icy, exercise extreme care to avoid the risk of slipping.

Never place anything heavy or sharp directly on the waterproofing membrane unless you have prepared a suitable protective surface first to set the object down on and distribute the load (such as wooden planks).

7. Accessibility / walkability - Ballasted and protected roofs

Depending on the type of ballast or paving, MAPEPLAN T B waterproofing membranes may be suitable for foot traffic or accessible only for maintenance purposes, as specified below.

- Gravel ballast:
accessible only for maintenance purposes, either to be performed on the actual roof and/or on any machinery or building systems found on the roof
- Ballast comprising pavers on supports (floating paving):
accessible for maintenance purposes and walkable
- Paving designed to take foot traffic (tiles laid on concrete substrate):
accessible for maintenance purposes and walkable
- Paving required to take vehicle loads (concrete screed, loose-laid paving blocks, laid stone slabs):
suitable for light vehicle traffic: load up to 30 kN
suitable for heavy vehicle traffic: load from 30 kN to 160 kN

- Soil ballast (roof garden or green roof):
 - accessible for maintenance of extensive green roof
 - accessible for maintenance of intensive green roof

If roofs ballasted with gravel are home to building services and machinery that require periodic maintenance or cleaning, we recommend producing walkways using concrete pavers laid on supports to give all operators a safe preferential access route to follow.

The roof build-up must be ballasted and protected as soon as possible to resist the negative pressure generated by wind. If the progress of work on site calls for temporary ballasting, make sure it is distributed across the whole surface of the waterproofing membrane, using suitable removable systems (for example, water, sandbags, etc.).

Until the ballast layer has been laid, when walking directly on the waterproofing membrane, special footwear must be worn, both for your own safety and to avoid damaging the membrane in question.

When using cleated sole footwear, we strongly advise you always to check that no fine gravel or other abrasive material has accidentally stuck to or become lodged in the sole before walking on the waterproofing membrane to avoid the risk of scraping or piercing the membrane in question.

If you are gaining access to a roof in driving rain or if the roof has pooling water or is icy, exercise extreme care to avoid the risk of slipping.

Never place anything heavy or sharp directly on the waterproofing membrane unless you have prepared a suitable protective surface first to set the object down on and distribute the load (such as wooden planks).

8. Cleaning the waterproofing membrane

Where necessary, the waterproofing membrane can be washed with water and a mild, non-foaming household detergent. Apply the detergent solution using non-scouring sponges, brushes or soft brooms, then rinse off with running water. Do not use solvents or other harsh products.

9. Building services and machinery

Building services and machinery installed on the roof must be suitably positioned on the roof and integrated/connected with the waterproofing membrane (plinths, supporting beams, etc.).

Building services and machinery must not sit directly on the waterproofing membrane and should instead be placed on bases with a suitable supporting surface designed to distribute the load correctly. In addition, the shape and material of the bases must be designed so that they do not damage the waterproofing membrane and/or the insulating panel underneath, where applicable.

Building services and machinery must not release or leak aggressive, polluting or damaging substances (liquids, solids or fumes) that might compromise the waterproofing membrane's performance.

In the event maintenance is performed on building services and on machinery, all work carried out while on the roof must be performed with extreme care so as not to damage the waterproofing membrane and suitable temporary protective structures must be in place. Be careful not to spill substances or materials on the roof that could damage the waterproofing membrane. In the event of accidental spills, all debris and/or leachate must be removed without delay and the waterproofing membrane must be suitably cleaned, where necessary using running water, and always acting in compliance with current safety and environmental standards.

If in any doubt, seek the advice of the Specialist Waterproofing Company, who will be able to provide you with any information and support you may need.

When placing new building services or new machinery on the roof, you are advised to call the Specialist Waterproofing Company first to avoid damaging the existing waterproofing membrane and ensure correct connection and sealing systems are put in place.

10. Snow loading on roofs

MAPEPLAN T waterproofing membranes feature excellent resistance to low temperatures so, broadly speaking, snow directly on top of the membrane does not cause damage and does not require action of any kind.



In certain cases, though, it might be advisable to go up on the roof to clear drains to encourage water generated as the snow thaws to drain off the roof.

Or you may want to check that snow has not built up so much that it reaches the top edge of skylights, vents, chimneys and other openings, if any, in the roof, in which case there is a risk of snow spilling over and getting inside the roof; or if there are overloading issues linked to the building's load capacity.

In certain situations of this kind, you may need to reduce the thickness of the blanket of snow in specific points or areas of the roof.

When accessing the roof, always exercise the utmost care and caution, using suitable personal and collective protective equipment, taking into account the added difficulty of accessing a roof covered in snow and/or ice.

Snow must be removed using manual tools that will not damage the waterproofing membrane and/or ballast layers and paving. Do not use metal spades and shovels: use plastic shovels with rounded edges instead. Remove surface layers of snow, being careful not to remove layers underneath in direct contact with the waterproofing membrane and/or ballast layers and paving to avoid accidental mechanical damage.

11. Waterproofing membrane repair and/or alteration work

In the event the waterproofing membrane is damaged accidentally, do not attempt makeshift repairs: always contact the Specialist Waterproofing Company.

Do not apply bitumen membrane patches on MAPEPLAN T waterproofing membranes (incorrect repair).

In the event of an emergency requiring urgent action, you can perform quick and simple repairs using single-sided butyl adhesive tape reinforced with aluminium foil, like Polyglass BUTYLSTRIP, cleaning the waterproofing membrane with water first. Please note that these are temporary emergency measures that are not designed to last, meaning you will still need to contact the Specialist Waterproofing Company to have proper long-lasting repairs made.

In the event you are altering or extending the waterproofing membrane (e.g. to accommodate new chimneys, changes to building services, etc.), do not attempt makeshift measures and instead contact the Specialist Waterproofing Company in good time.

12. Periodic waterproofing membrane inspection and cleaning

To ensure the waterproofing system keeps performing at its peak and retains its properties in the long term, it is good practice to inspect and clean the roof at regular intervals.

Said work is summarized in the list below, divided up into:

- General inspections
- Specialist inspections

Other kinds of inspections and cleaning/maintenance work may be helpful/required depending on the specific case, or you may need to perform the listed work at shorter intervals. Consequently, the Designer or specialist will need to add to our guidelines accordingly.



13. General inspections

General inspections	Interval	Performed By:	Notes
Clean leaf guards on drains	Six-monthly	Owner/manager (*)	To avoid them becoming clogged and limiting or compromising drain performance
Clean and eliminate any dirt (soil, sand, etc.) on the roof and waterproofing membrane	Six-monthly	Owner/manager (*)	To stop a culture bed being created and promoting the growth of vegetation or micro-organisms
Clean and eliminate any debris or rubbish on the roof	As required	Owner/manager (*)	To stop foreign materials and rubbish damaging the waterproofing membrane
General visual inspection of the roof and equipment installed on it to detect any evident issues (waterproofing, skylights, building services, etc.)	Six-monthly	Owner/manager (*)	To ensure any issues are reported promptly to the party tasked with performing the work
Clean and remove any vegetation growing on the roof	Six-monthly	Owner/manager (*)	Mapeplan® T membranes offer good resistance to root penetration, but it is still advisable to stop vegetation growing and spreading

* This job can be delegated to the Specialist Company by taking out an inspection and maintenance agreement

14. Specialist inspections

General inspections	Interval	Performed By:	Notes
Visual inspection of trims and metal flashing	Yearly	Specialist Waterproofing Company	Check fixings and check for leaks and corrosion
Visual inspection of silicone sealing	Yearly	Specialist Waterproofing Company	Check for leaks and check adhesion
Visual inspection of waterproofing membrane and of details and accessories connected to it	Yearly	Specialist Waterproofing Company	To detect any issues that might limit or compromise its performance
Visual inspection of underside of roof deck	Yearly	Specialist Waterproofing Company	To detect any traces of water infiltration or other issues

All these jobs must be delegated to the Specialist Company by taking out an inspection and maintenance agreement

15. Sample inspection and maintenance checklist for FPO/TPO membranes

INSPECTION AND MAINTENANCE CHECKLIST - MAPEPLAN T FPO/TPO

FACILITY:

ADDRESS:

OWNER:

CONTACT PERSON:

MAINTENANCE MANAGER:

CONTACT PERSON:

SPECIALIST COMPANY:

CONTACT PERSON:

YEAR OF COMPLETION:

REFERENCES AND ATTACHED:

ROOF BUILD-UP: (indicate all layers making up the roof system)

OTHER USEFUL

Note:

We have compiled this draft inspection and maintenance checklist for Mapeplan T membranes by drawing on our knowledge and experience. Nonetheless, please understand that the instructions are given as a rough guide only.

It is up to the Designer and Specialist Company to assess actual site conditions and determine what inspection and maintenance work is required

GENERAL INSPECTIONS

PERFORMED BY:

CARRIED OUT ON:

NEXT INSPECTION DUE:

Checks and work carried out:	Pass	Fail (see notes)	Monitor (see notes)	Notes
Clean grates on drains				
Clean roof surface				
Clean and remove debris and rubbish				
Clean and remove vegetation				
Other work carried out				
Visual inspections:	Pass	Fail (see notes)	Monitor (see notes)	Notes
General state of roof				
General state of waterproofing membrane				
Building services 1				
Building services 2				
Building services 3				
Trims/flashing 1				
Trims/flashing 2				
Trims/flashing 3				
Skylights/domes				
Walkways				
Other				
Other				

SIGNATURE OF PERSON PERFORMING WORK:

SIGNATURE OF MAINTENANCE MANAGER:

SPECIALIST INSPECTIONS

PERFORMED BY:

CARRIED OUT ON:

NEXT INSPECTION DUE:

Checks and work carried out:	Pass	Fail (see notes)	Monitor (see notes)	Notes
Clean grates on drains				
Clean roof surface				
Clean and remove debris and rubbish				
Clean and remove vegetation				
Other work carried out				
Visual inspections:	Pass	Fail (see notes)	Monitor (see notes)	Notes
General state of roof				
Waterproofing membrane flat				
Waterproofing membrane edge turn-ups				
Waterproofing membrane wall turn-ups				
Waterproofing membrane skylight turn-ups				
Mechanical fixing system				
Thermal insulation panels				
Roof edge trim				
Wall junction trim				
Trim				
Drains				
Junctions between roof and pipes/vents				
Junctions between roof and uprights				
Skylights/domes				
Walkways				
Silicone sealing 1				
Silicone sealing 2				
Building services 1				
Building services 2				
Building services 3				
Other				
Other				

SIGNATURE OF PERSON PERFORMING WORK:

SIGNATURE OF MAINTENANCE MANAGER:

We have compiled this document on the use, inspection and maintenance of Mapeplan T membranes by drawing on our knowledge and experience to date. Nonetheless, please understand that all instructions given are meant as general guidelines and feature only the most basic work prescribed. If you are planning to put together a maintenance plan for the waterproofing system, you will need to assess actual site conditions and, where necessary, supplement and add to the inspections and work featured.

Use, inspection and maintenance SYNTHETIC WATERPROOFING MEMBRANES MAPEPLAN T FPO/TPO

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