

REOXTHENE® LINE

SUPERIOR QUALITY
RECORD-BREAKING LIGHTNESS



**REOXTHENE
TECHNOLOGY®**
WATERPROOFING MEMBRANE WITH REVOLUTIONARY TECHNOLOGY

POLYGLASS®
MAPEI
GROUP



POLYGLAS

MADE IN CANADA



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INTRODUCTION

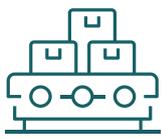
In recent years, sustainability in the building industry has become increasingly important at the international level, to the extent that it is included in the Sustainable Development Goals of the United Nations (UN) 2030 Agenda.

A building can be considered environmentally sustainable when it is designed, constructed or renovated in order to reduce its environmental impact as much as possible throughout its entire life cycle.

With its products, systems and solutions, every day Polyglass strives to continue on its path towards full commitment to all-round sustainability, for the environment and for mankind.

SUSTAINABLE WATERPROOFING SOLUTIONS

INCREASED SAFETY, MORE VALUE AND LESS IMPACT



RAW MATERIALS AND PRODUCTION

EFFICIENT RESOURCES

Polyglass provides **roofing systems** that use **less energy** and **resources** than other technologies and systems, with low potential for global warming and therefore with **reduced emissions** of **carbon dioxide** (Carbon Footprint).



DURABILITY AND REDUCTION IN COSTS

LIFE CYCLE EXTENSION

Waterproofing systems made of Polymer Distilled Bitumen Membranes have a **reduced cost** throughout their **life cycle**. They are still **profitable investments** for customers due to the **limited initial cost** of the roofing work **for the entire project**, to the **durability** of the **waterproofing system** and to **lower maintenance costs** required throughout the entire **life cycle** of the roofing.



USE AND MAINTENANCE

ENERGY SAVING

Polyglass roofing systems can **save energy** when used with **suitable thermal insulation systems**.

Polyglass cool roofs and **green roof systems** help to **reduce** the spread of urban **heat islands** and **control water run-off** from roofs.



APPLICATION

HEALTH AND SAFETY

Polyglass provides **VOC-free roofing solutions**, which help to **prevent smog in summer** and **improve health and safety** conditions during the **roofing application process**.

REOXTHENE® IS THE
FIRST RANGE OF
POLYMER BITUMEN
MEMBRANES OF ITS KIND
TO HAVE **OBTAINED**
ENVIRONMENTAL
PERFORMANCE
DECLARATION (EPD)

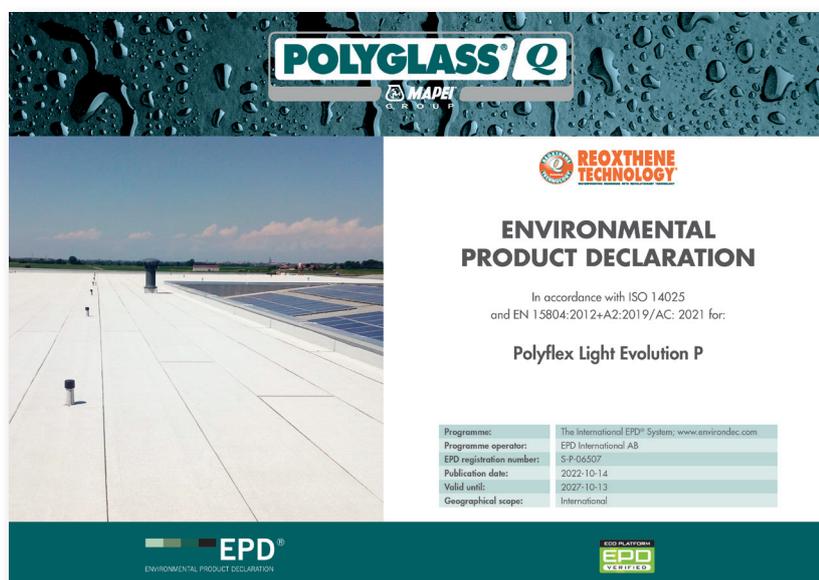
SUSTAINABILITY:

The Polyglass approach

From the very outset, POLYGLASS has been committed to safeguarding the planet. The priorities of our Research & Development activities have always included research and the use of selected raw materials with low environmental impact and formulations that extend the life cycle of roofing as far as possible. Of the various waterproofing solutions existing for roofing, polymer distilled bitumen membranes are still one of the most environmentally friendly solutions due to their superior durability over time.

Polyglass, which has always focused on the needs of man and the environment, has now also obtained environmental product (EPD) certification for its REOXTHENE® range. This document, created voluntarily, clearly provides information on the environmental impacts of the manufacturing of a specific quantity of a product, with reference to the analysis of its entire life cycle.

This certificate, a Type III Environmental Declaration compliant with the ISO 14025 standard, can guide consumers towards a more responsible choice by helping them select products with low environmental impact. The membranes in the REOXTHENE® TECHNOLOGY range with EPD certification also comply with the requirements of many voluntary eco-sustainability protocols for buildings (such as LEED and BREEAM) and with mandatory protocols (such as CAM - Minimum Environmental Criteria, in force in Italy for public tenders since 2017).



REOXTHENE® TECHNOLOGY

THE MAIN ADVANTAGES OVER TRADITIONAL WATERPROOFING SYSTEMS

The REOXTHENE® range, created at the Polyglass research laboratories represents excellence in the field of innovation and lightweight membrane technologies, thanks to a particularly polymer-rich formulation that guarantees a matrix of exceptional durability.

REASONS FOR CHOOSING A REOXTHENE® MEMBRANE:

- **Fewer flames during application** resulting in lower gas consumption.
- **Easier handling of the membrane** even in the most extreme on-site situations.
- **Faster application** that allows laying in less time, thus ensuring excellent weldability of joints and with the underlying layers.
- **No fingerprints are left when laying** due to the higher thermal inertia of the membrane.
- **Increased durability** of the roofing as a result of using special anti-ageing additives in the polymer matrix.
- **Reduced environmental impact** due to lower CO₂ emissions into the air and the use of recycled raw materials.
- **A lighter roll compared to traditional membranes of the same thickness.**

MORE THAN 60 MILLION SQUARE METRES OF ROOFING HAVE BEEN IMPLEMENTED WITH REOXTHENE® SYSTEMS BY POLYGLASS

SCIENTIFIC APPROACH

APPLIED TO LIGHTWEIGHT REOXTHENE® TECHNOLOGY MEMBRANES

Applying the scientific method is the prerogative of the Polyglass R&D department. Every day, this approach is implemented with the systematic and structured management of research projects. The design and prototyping phases of products are supported with analysis and data from accredited laboratories or university research centres rather than from in-company laboratory activities, carried out in compliance with the main regulations of the industry.

Polyglass has specifically **designed and implemented an innovative scientific evaluation procedure** in order to obtain an objective and repeatable evaluation model to assess the contribution that the use of lightweight REOXTHENE® membranes can offer in terms of **all-round sustainability**.

Thanks to the identification of an innovative

method of laboratory analysis and specifically designed and implemented application tests, Polyglass can now measure and assess, in an **objective, reliable and verifiable** manner the contribution that each key performance indicator of a membrane can provide to meet the needs **of the installer, the designer and the customer** regarding the work.



COMPOUND STUDY

The innovative Research & Development approach involved starting from a conventional analysis envisaged for developing bituminous membranes including: ring&ball, flexibility, dispersion, ageing resistance, etc., and increasing knowledge of the REOXTHENE® compound by studying the rheological profile of the compound at the initial phase of application and after a certain period of ageing. This allowed the performance of the membrane to be assessed during laying and throughout its life cycle, and its useful service life (durability) to be calculated.

The use of the Dynamic Shear Rheometer (DSR) to support the compound formulation proved to be of fundamental importance so as to obtain a complete picture of compound performance at varying parameters of temperature, stress and strain.

This allows a kind of digital fingerprint of the material to be obtained, which identifies its specific characteristics in the various phases of use.

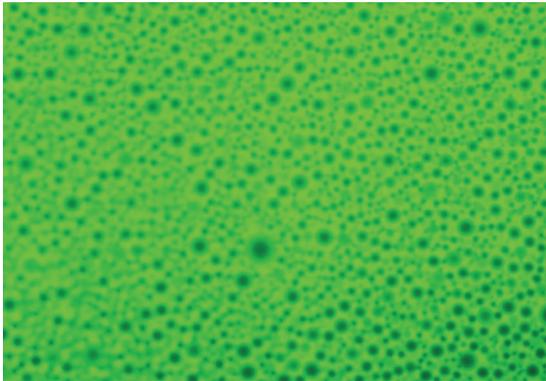
This technique was used to convert the superior performance of REOXTHENE®, already widely recognised by all industry specialists, into data during the application phase and the subsequent phase of use. The optimal weldability, ease and speed of laying, and the excellent quality of the overlaps and resistance to ageing were therefore related to the rheological profile of this superior compound, revealing the very core of the know-how of Polyglass.



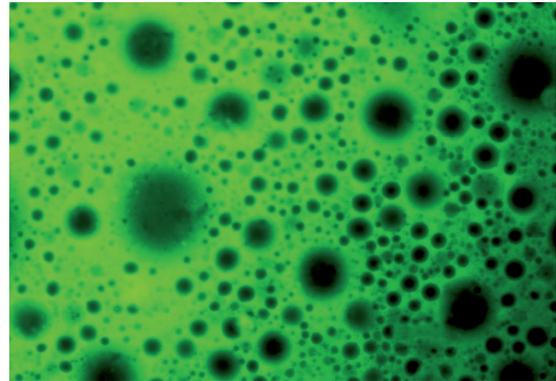
A better compound for superior adhesion

Due to the higher quantity of selected polymers, the innovative REOXTHENE® ULTRALIGHT TECHNOLOGY compound guarantees better dispersion of the bituminous matrix than a traditional membrane. The higher quality of the compound therefore results in better adhesion, quantified as +20% (in-company peeling tests of the joints in compliance with UNI EN 12316 standards) compared to traditional membranes.

REOXTHENE® Membrane



Traditional Membrane



200x magnification - Images of dispersions obtained using an optical microscope. The dispersed bitumen phase is shown in black, whereas the continuous phase of a predominantly polymeric composition is shown in green.



Joint peeling test - The holes in the photo on the right indicate possible weak points in the welding.

Thermal inertia

The specific heat of the REOXTHENE® compound is higher than that of a traditional compound. This implies higher thermal inertia of the entire REOXTHENE® product range, with advantages in the application phase and during the entire life cycle of the roofing:

EASY AND CONTROLLED LAYING OF THE MEMBRANE

Overlaps and the execution of details are facilitated.

NO FOOTPRINTS

During laying, the surface temperature of the newly applied roll is lower, preventing the formation of footprints.

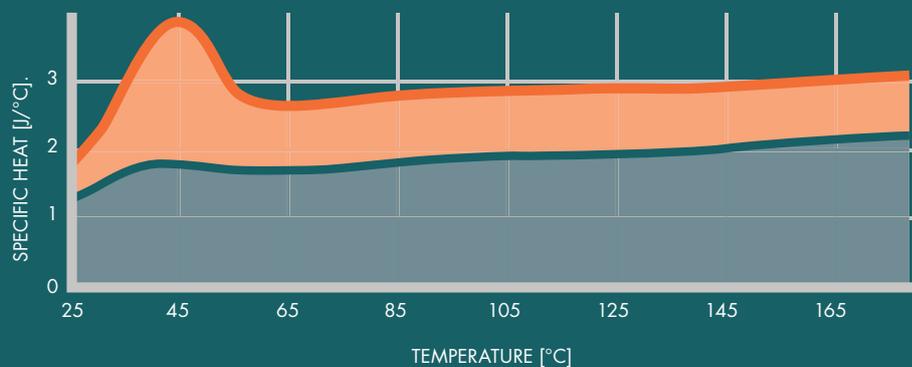
REDUCTION IN SURFACE TEMPERATURES

Due to the higher specific heat, it is less likely that the roofing will heat up.

LESS FLAME = INCREASED DURABILITY

The less flame used during application ensures reduced ageing of the waterproofing system over time.

LABORATORY TESTING USING DIFFERENTIAL SCANNING CALORIMETRY ANALYSIS



The orange curve shows the development of the specific heat curve of REOXTHENE® technology

Roofing durability

The images below compare the result of a REOXTHENE® compound with a traditional compound after ageing using Q-UV test cycles for a total of 3,000 hours. Each cycle lasts 360 minutes and consists of 300 minutes of UV radiation at 60°C and 60 minutes of rain.

The difference in performance is immediately noticeable: the surface of the traditional compound shows blisters that indicate partial deterioration of the compound.

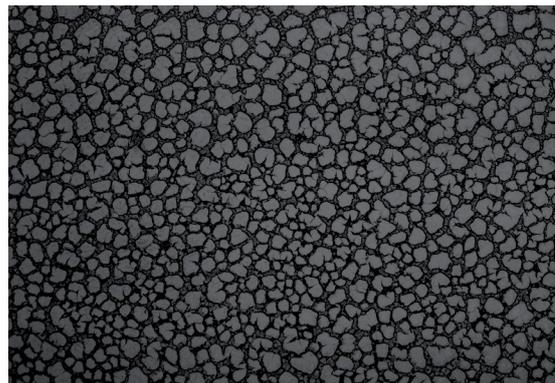
The surface of the REOXTHENE® compound, by contrast, is free of defects other than those due to the physiological ageing of the compound.

The test is particularly strict as it was performed without any surface protection (mineral or paint).

REOXTHENE® Membrane



Traditional Membrane



Q-UV ageing 3,000 hours - Q-UV test in compliance with the UNI EN 1297 standard performed on a smooth membrane.

APPLICABLE TESTS

Our technical department has developed a standard method of assessing the application characteristics of membranes, based on objective and repeatable parameters.

To date, no specific harmonised tests exist to help compare the applicability of one membrane with another with similar characteristics, but we rely solely on the experience of technicians in the industry.

The idea therefore arose from the need to standardise application tests in order to obtain

benchmarks for the development and continuous improvement of new types of membranes, trying to implement a scientific method to assess the quality of the application in an objective and repeatable manner.

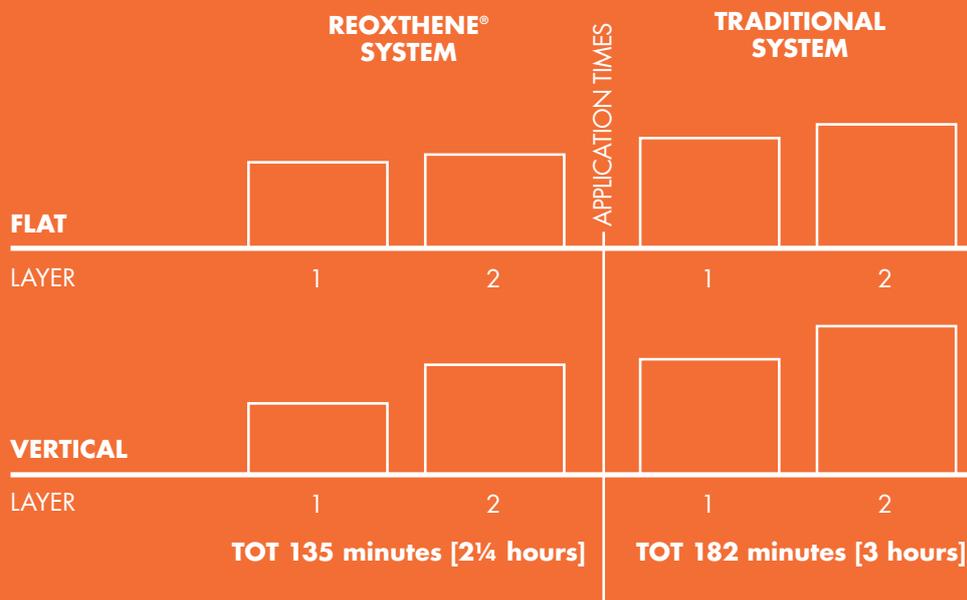
In order to carry out the tests objectively, an application method was developed to measure the energy absorbed during application, the application speed, the on-site footprint and lastly the trend in surface temperature.



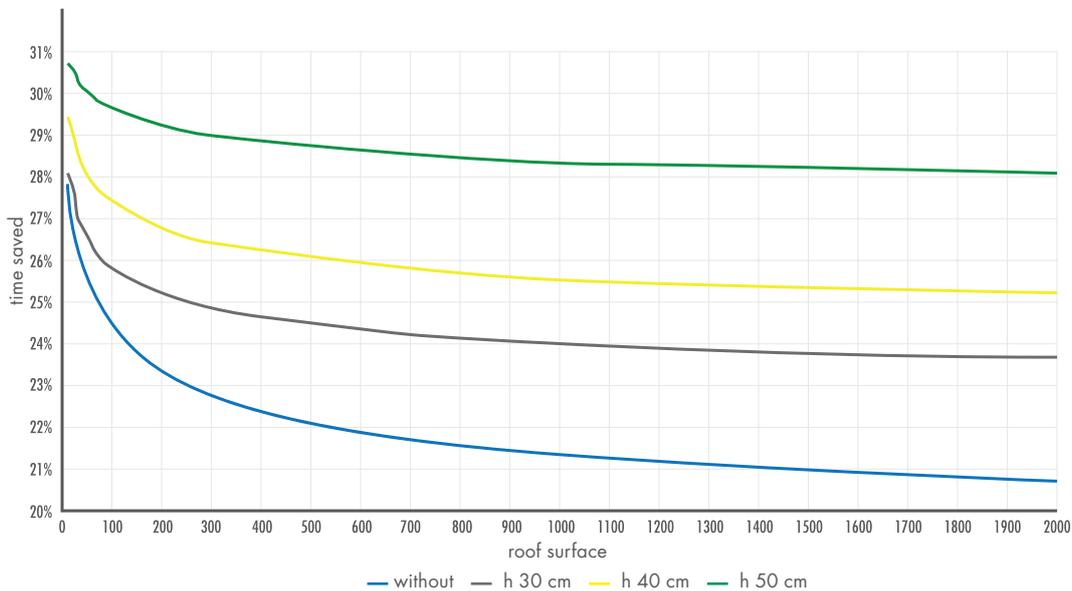
REOXTHENE® TECHNOLOGY AND TRADITIONAL SYSTEMS

LAYING TIMES COMPARED

Under the same application conditions, with the REOXTHENE® membrane you can save more than 20% in time compared to laying a traditional membrane.



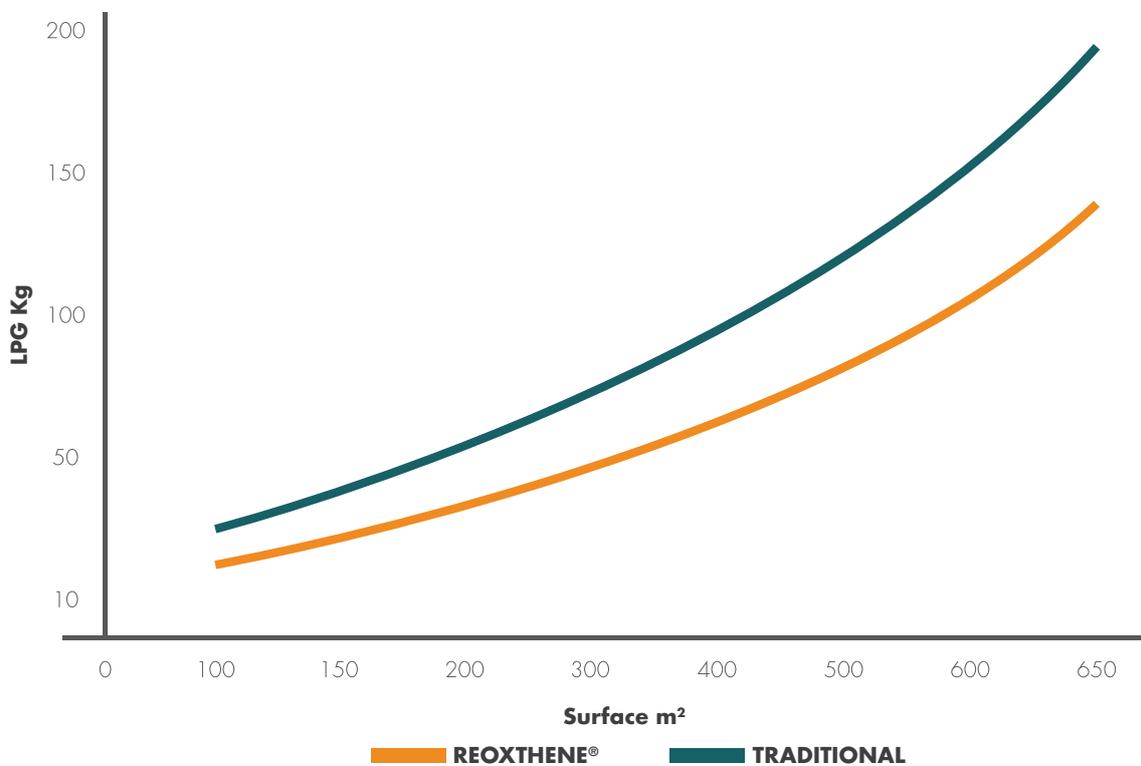
Comparison of the time required to waterproof a flat roof without skylights or with the presence of a 5% net skylight area as a depending on the height of the substrate.



LPG consumption

DURING FLAME APPLICATION OF MEMBRANES

Compared to traditional systems, the saving in gas consumption with REOXTHENE® membranes gradually increases as the surface area to be waterproofed is extended.

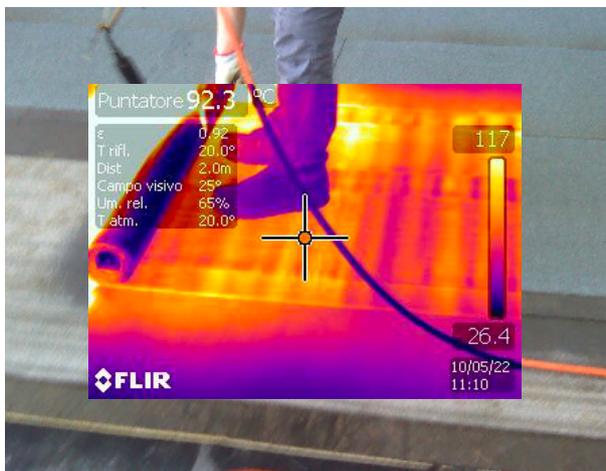
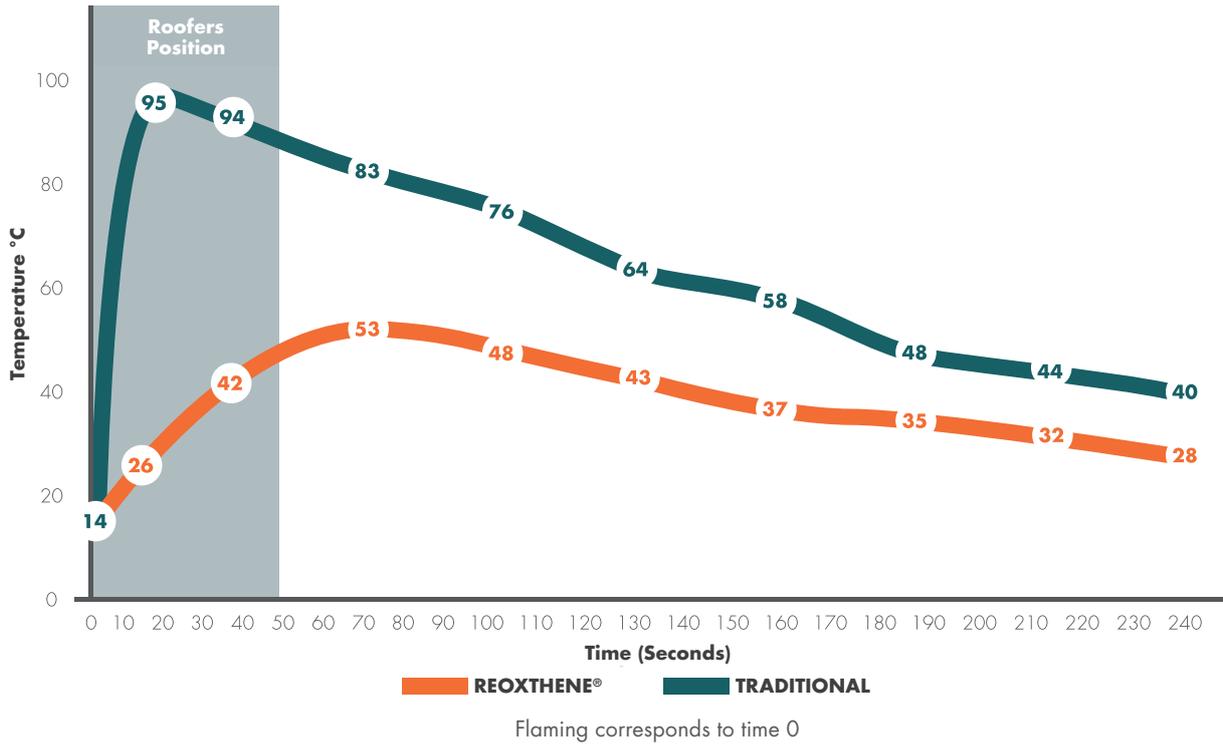


For roofing of about 600 m², the LPG consumption when laying REOXTHENE® membranes is lower than 20% of a traditional membrane.

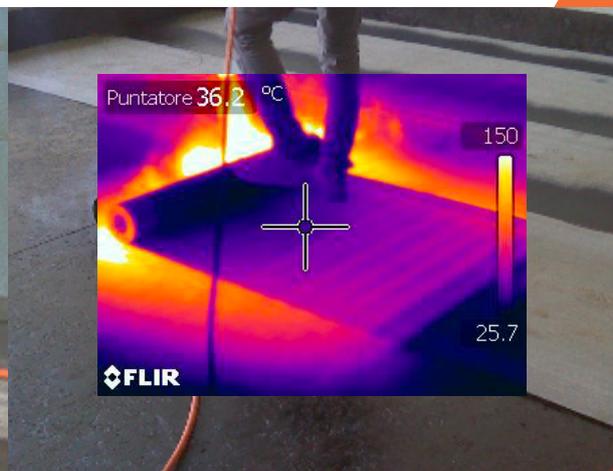


Temperature comparison

SURFACE TEMPERATURES MEASURED DURING FLAME APPLICATION OF MEMBRANES



TRADITIONAL MEMBRANE



REOXTHENE® MEMBRANE

Footprints

The lower deformability of the compound guarantees that the membrane thickness is maintained across its entire surface area for more effective and long-lasting waterproofing. In addition, thanks to a lower surface temperature REOXTHENE® membranes are less prone to the phenomenon of footprints during application.



TRADITIONAL MEMBRANE



REOXTHENE® MEMBRANE

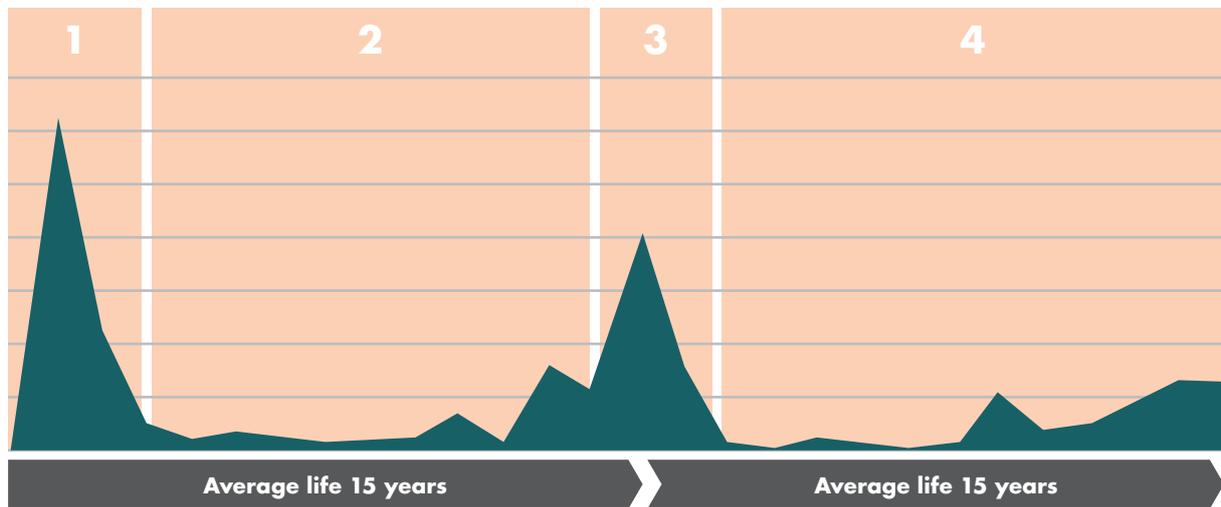


REOXTHENE® TECHNOLOGY

ADDED VALUE OVER TIME

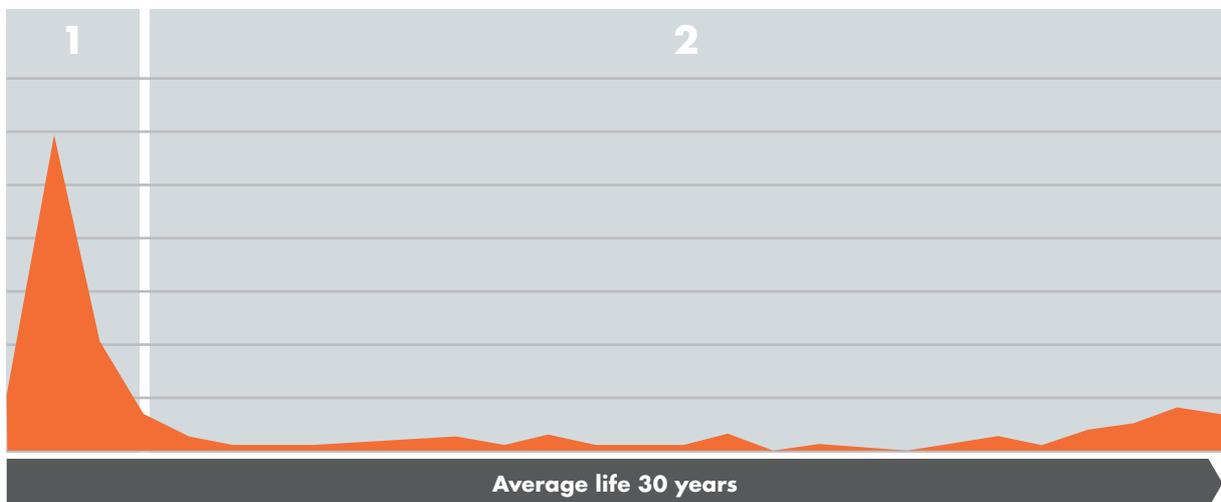
The total investment by the customer to create waterproof roofing with REOXTHENE® systems can be reduced by more than 30% at the end of the life cycle of the roofing.

Cash flow - Traditional System



1 Initial investment - 2 Maintenance - 3 Resurfacing - 4 Maintenance

Cash flow - REOXTHENE® System



1 Initial investment - 2 Maintenance

REOXTHENE® RANGE

- + FULL RANGE FROM -5 °C TO -20 °C**
- + IMPROVED MECHANICAL PERFORMANCE**
- + EXTENDED USABLE LIFE OF THE ROOFING**
- + ROOT BARRIER VERSION, OPTION FOR BRIDGES AND VIADUCTS**
- + WEIGHTS UP TO 30% LESS THAN TRADITIONAL MEMBRANES**
- + PRODUCTS CERTIFIED BY INDEPENDENT LABORATORIES AND AUTHORITIES**
- + WITH EPD ENVIRONMENTAL PRODUCT CERTIFICATION**

FLEXIBILITY AT LOW TEMPERATURE	COMPOUND TYPE	PRODUCT	INTENDED USES									
			ROOFING EN 13707							FOUNDATIONS EN 13969		BRIDGES AND VIADUCTS EN 14659
			SINGLE-PLY		MULTI-PLY				ROOT BARRIER	RISING DUMP	GROUND-WATER	
			EXPOSED	BALLASTED	EXPOSED UNDER LAYER	CAP SHEET	BALLASTED UNDER LAYER	CAP SHEET				
-20	SBS	FLEXO LIGHT P			•	•	•	•		•		
	APP	POLYFLEX LIGHT EVOLUTION P	•	•	•	•	•	•		•		
	APP	POLYFLEX LIGHT HP P			•	•	•	•		•	•	•
-15	APP	ANTIRADICE LIGHT P					•	•	•	•		
-10	APP	EVOLIGHT HP P			•	•	•	•		•	•	•
	APP	EVOLIGHT S P			•	•	•	•		•		
-5	APP	BITULIGHT P			•	•	•	•		•		





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