

Rothoblaas

Product: Membrane

Rothoblaas is an Italian multinational company from the Alpine region, leader in the development and supply of high-tech solutions for the areas of beam and post and Mass Timber construction systems, energy efficiency, zero emissions and other building best practices.



Membrane TRASPIR EVO UV 115

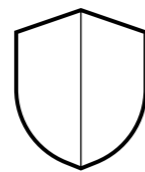
Pilot Measurement & Verification Line 7

Managed by: CUT



PM&VL7

Mechanical, durability, vibroacoustic, thermal, and microclimate comfort tests of envelope products and their connectors. Mechanical, vibroacoustic, thermal, and structural (scanning and optical microscope, spectrometer) tests are used for ageing diagnosis.



SAFETY



EFFICIENCY

Which is the need covered by this service?

The implemented program of mechanical and durability tests was based on certification requirements for membranes with appropriate modifications taking into account more intense UV exposure than those provided for in the standard. The obtained results set the path for further research and product development as well as making the construction products comparable.

Design of Experiments

Mechanical properties

Structural properties

Durability to UV and heat



Tensile properties according to EN 13859-1 EN 12311-1

Resistance to tearing according to EN 13859-1 EN 12310-1

Observation in optical microscope (OM)

Observation in scanning electron microscope (SEM)

Spectrometric analysis (FTIR)

STAGE 1: Structural properties before ageing

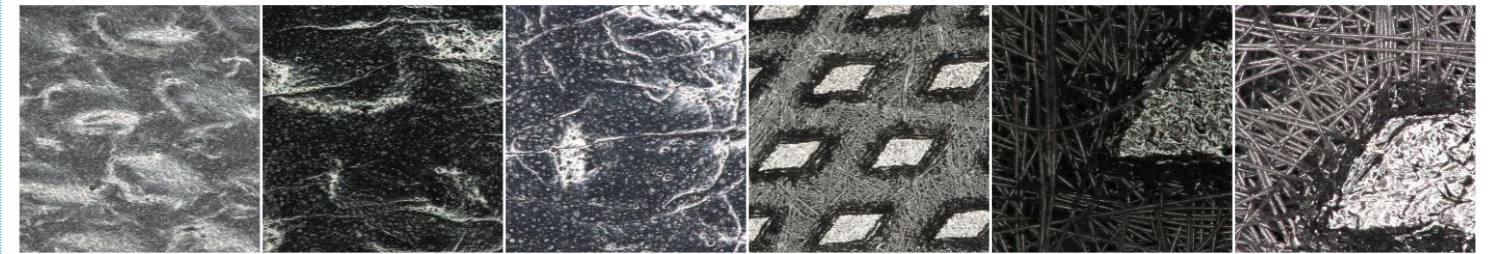
STAGE 2: Exposure to UV according to Annex C EN 13859-1 with modification to 5000h; FTIR after 1000, 2000, 3000, 4000 h

STAGE 3: Structural properties after UV ageing

STAGE 4: Exposure to heat according to Annex C EN 13859-1

STAGE 5: Structural properties after UV and heat ageing

Results – structural properties



TOP reference

TOP after UV

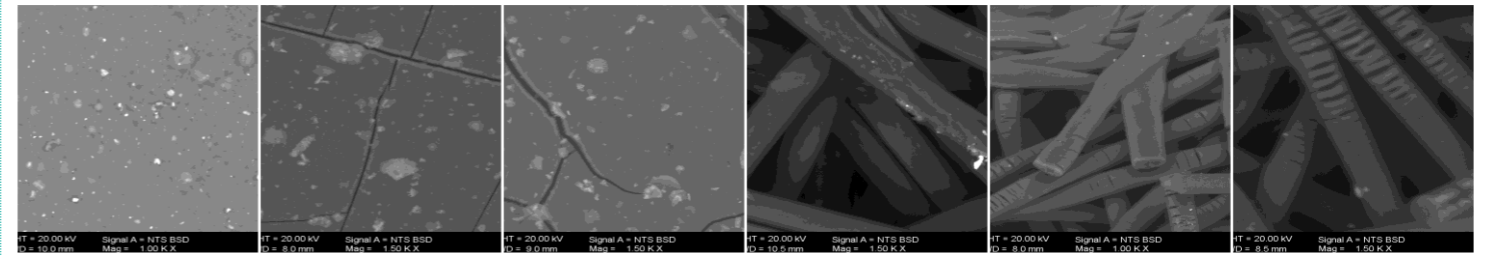
TOP after UV+heat

DOWN reference

DOWN after UV

DOWN after UV+heat

OM observation before and after ageing



TOP reference

TOP after UV

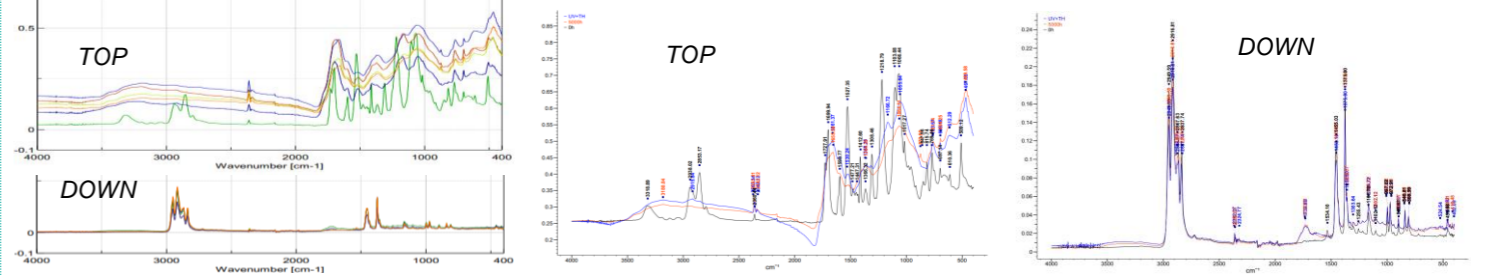
TOP after UV+heat

DOWN reference

DOWN after UV

DOWN after UV+heat

SEM observation before and after ageing



FTIR analysis before, during and after UV, and after UV + heat ageing

Open Innovation outcomes

The standard ageing time under UV rays was significantly modified from 336 to 5000 hours to better reflect real exposure conditions and enhance the credibility of product performance information. In addition, the scope of diagnostics before and after ageing was extended to include the observation of microstructure in an optical and scanning microscope as well as FTIR analyses before, during and after ageing.



Conclusions

Exposure to 5000h UV of membrane causes their degradation (the both side) visible changes include microcracks and defragmentation of fibers PP.
IR spectra after exposure to UV for 1000, 2000 3000, 4000 and 5000 hours allow to monitor changes and determine the beginning of degradation.
IR spectra and SEM images show that exposure to heat intensifies the degradation process. No additional changes were observed.



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