

ECO₃ TECHNOLOGY

SMOG-REDUCING, GRANULE-SURFACED MEMBRANES



SUSTAINABLE
SOLUTION



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SOPREMA'S COMMITMENT TO SUSTAINABLE SOLUTIONS

For over 100 years, SOPREMA has been committed to the innovation and development of products that enhance performance and protect the environment. The EPA has published reports identifying dozens of cities around the country that have failed to meet National Ambient Air Quality standards for ground level ozone, or smog. SOPREMA's products aim to help the environmental efforts of reducing smog and improving air quality. 3M™ Smog-reducing Granules were designed to do just that.



What are nitrogen oxides (NO_x)?

Nitrogen oxides (NO_x) are gases formed from emissions from motor vehicles, power plants and commercial and industrial operations. These gases react with sunlight and VOCs (volatile organic compounds) in the atmosphere to create what is commonly referred to as ground-level ozone or smog. Breathing ground level ozone can create acute health problems for children, the elderly, and people of all ages with lung diseases such as asthma.



What are 3M™ Smog-reducing Granules?

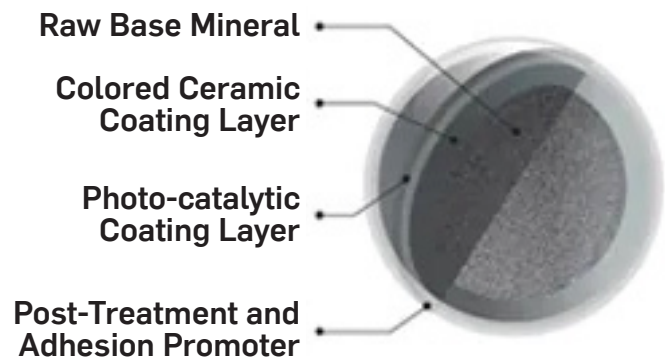


Improving Our Climate

3M™ Smog-reducing Granules

3M Smog-reducing Granules are ceramic-coated minerals designed to have smog-reducing capability. SOPREMA's **ECO₃ GRANULE**-surfaced membranes utilize this technology for low-slope roofing applications.

These roofing granules are designed with a photo-catalytic coating layer that transforms nitrogen oxide (NO_x) into water-soluble ions that are then washed away by rainwater.



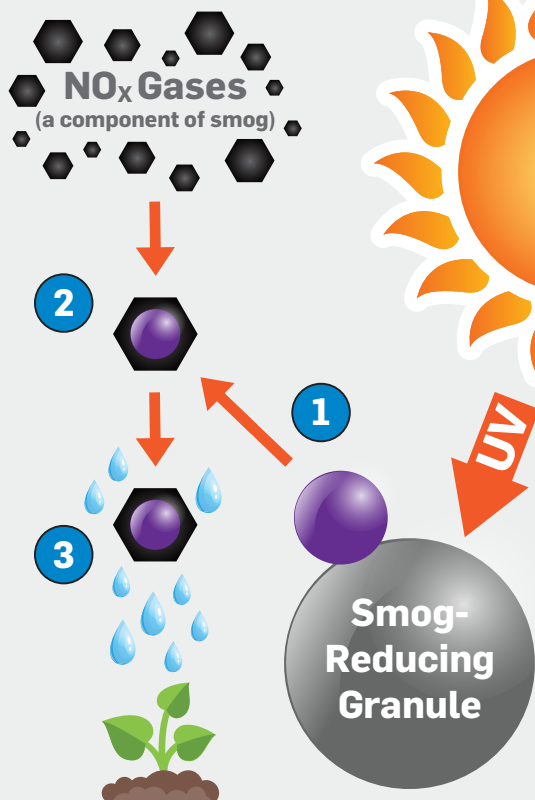
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GRANULE-SURFACED MEMBRANES



- **3M™ SMOG-REDUCING GRANULES** are tough, non-porous, weather and UV resistant, ceramic-coated base minerals.
- Sunlight activates the surface of the photo-catalytic granules to transform smog into water-soluble ions.
- Technology proven by 3M and Lawrence Berkeley National Laboratory (LBNL) to remove smog pollutants that come in contact with the roof

How do 3M™ Smog-reducing Granules work?



1. When exposed to the sun's rays, the photocatalytic coating on the granules generates surface-bound radicals.
2. Nitrogen oxides react with these radicals and create nitrate salt; a plant-usable form of nitrogen.
3. The low level nitrate deposits are then washed away by rainwater or dew.





How effective are smog-reducing granules at reducing nitrogen oxides (NOx)?

ENVIRONMENTAL BENEFITS

- We know that trees have a natural ability to clean the air. ECO₃ granule-surfaced membranes contribute to cleaner, healthier communities with technology inspired by the power of trees.
- Every 500 ft² of roofing membrane is equivalent to approximately three mature trees.
- A 20,000 ft² (1859m²) roof covered with **ECO₃ GRANULE**-surfaced membranes has the ability to offset approximately 8,000 miles worth of car emissions yearly. **That is the power of 120 trees!**



- The smog fighting ability of the granules is not consumed, but is maintained over the life of the roof.



TESTING & VALIDATION

Lawrence Berkeley National Laboratory testing validated the efficacy of this material in reducing smog and contributing towards air purification. Calculations were prepared on the performance equivalence of trees which naturally clean the air.

**This calculation varies depending on sunlight, humidity and levels of NOx in the atmosphere.*

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GRANULE-SURFACED MEMBRANES

What SOPREMA
products utilize 3M™
Smog-reducing Granules?



**ELASTOPHENE®
FLAM FR GR ECO₃**
PRODUCT #03805



**ELASTOPHENE®
FR GR ECO₃**
PRODUCT #01103



**3M™ SMOG-REDUCING
GRANULES PAIL**
PRODUCT #G03942



**SOPRALENE® FLAM
180 FR GR ECO₃**
PRODUCT #03942



**SOPRALENE®
180 FR GR ECO₃**
PRODUCT #01323

LEED®/Energy code
requirements

- A modified bitumen roof with a cap sheet membrane surfaced with SMOG reducing granules can contribute LEED® points under LEED® v4.1 as part of an overall project strategy - (IN) Innovation - Technology Category.





ECO₃ at Work...

DALLAS FORT WORTH AIRPORT — DALLAS (TX)

Design: PGAL Inc., Addison, TX

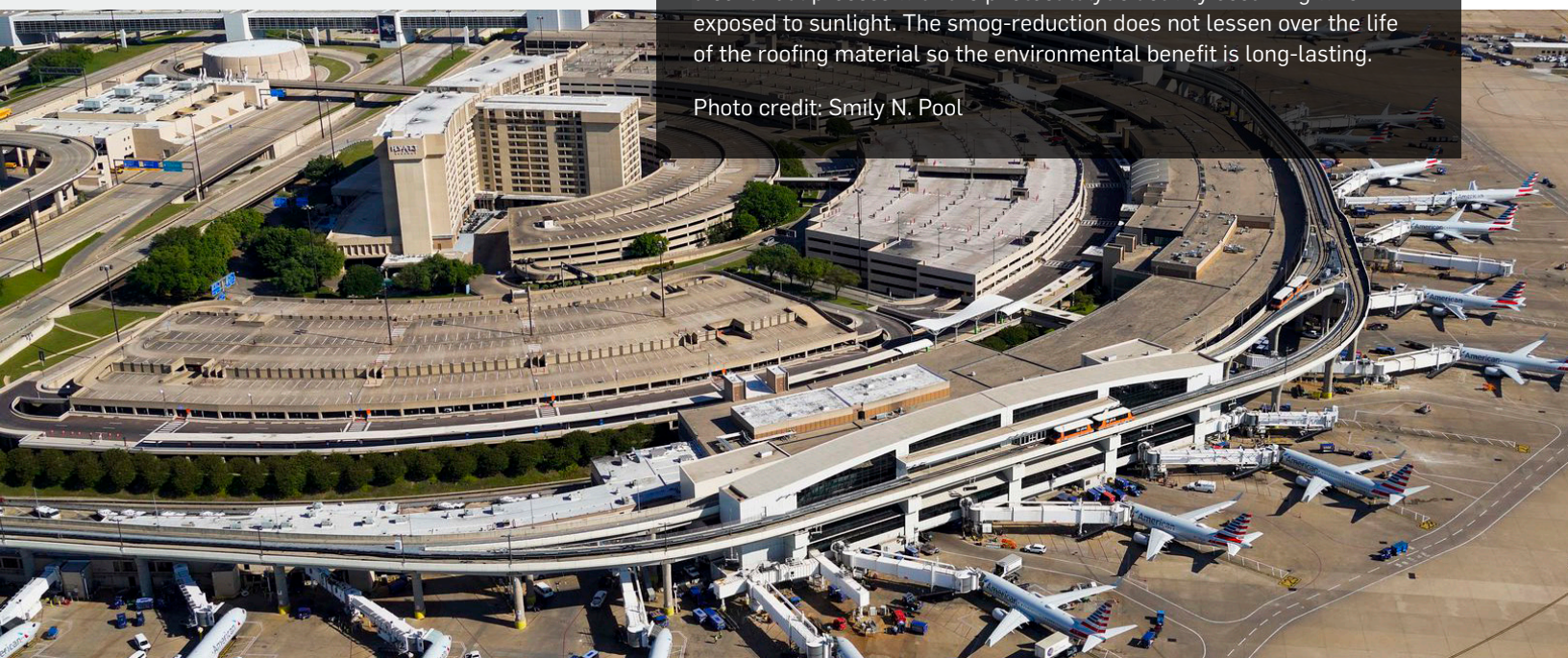
Construction: Chamberlin Roofing and Waterproofing

SOPREMA® Products: ELASTOPHENE® and SOPRALENE®

Terminal F Skylink buildings – 74,000 ft² of ELASTOPHENE® – two-ply SBS-modified bitumen and 11,000 ft² of SOPRALENE® for flashing, the equivalent of approximately 510 trees.

SOPREMA **ECO₃ GRANULE**-surfaced membranes were specified due to a desire to improve the air quality surrounding the airport. This is a continual process with the photocatalytic activity occurring when exposed to sunlight. The smog-reduction does not lessen over the life of the roofing material so the environmental benefit is long-lasting.

Photo credit: Smily N. Pool



Additional Resources

CLICK ON TITLES TO
ACCESS INFORMATION



LBNL STUDY

<https://escholarship.org/content/qt96h6m5rv/qt96h6m5rv.pdf>



3M PRESS RELEASE

<https://news.3m.com/2018-06-28-3M-TM-Smog-reducing-Granules-Harness-the-Power-of-the-Sun-to-Improve-Air-Quality>



PRODUCT INFORMATION

<https://soprema.us/elementor-41305/>



PRODUCT VIDEO

<https://youtu.be/-h7dCS5RQVA>

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