

## Roofing Contractor Reference Guide

### Smog-Reducing Contractor Training Quick Facts

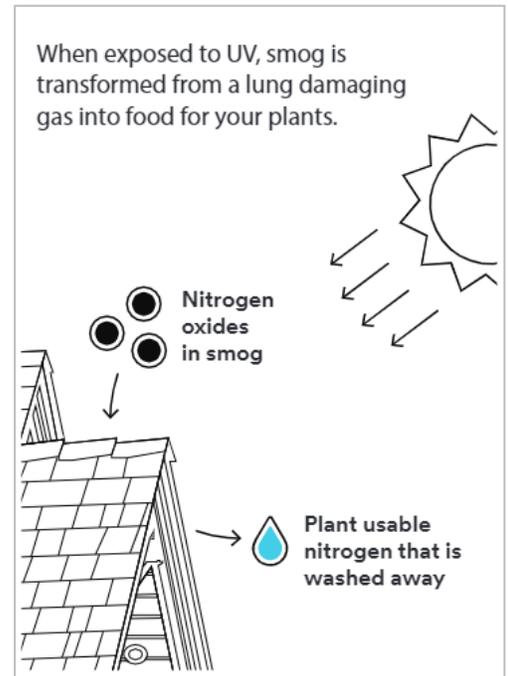
Smog-reducing roofing granules by 3M are integrated into roofing materials to transform harmful smog gases into a plant usable form of nitrogen.

Shingles with Smog-reducing granules remove smog gases from the air with the same effect as trees.

- When the roof is exposed to the sun, UV light causes a chemical reaction (called photocatalysis) on the granule surface.
- The reaction converts harmful smog gases into a microscopic salt solid that is water-soluble and safely washes away with rain over time.
- The most salt that could accumulate, still invisible to the naked eye, would be similar to the amount of plant food used for a house plant.

Smog-reducing roofs help convert the nitrogen oxides in smog into a plant usable form of nitrogen that is washed away.

Nitrogen oxides or  $\text{NO}_x$  are a key component of smog and is made up of the invisible gases Nitric Oxide (NO) and Nitrogen Dioxide ( $\text{NO}_2$ ). In this smog mix, Nitrogen Dioxide ( $\text{NO}_2$ ) is of the greatest concern because it is harmful at the parts per billion level. Each roof installed should be an opportunity to make an impact by sharing this with your clients.



### 10 Common Homeowner Sentiments

3M surveyed 1,000 homeowners to uncover their reactions to the reroofing process.

Connect with homeowners by addressing their top concerns. Incorporate these into your proposal to help your clients become familiar with the process and set expectations for them early on in your discussions.

1. Don't feel knowledgeable about the price or value of shingles
2. Strongly believe that the brand is relevant when selecting a shingle
3. Question what the installation process looks like
4. Typically looking to the contractor throughout the process.
5. Question how they determine if a contractor is reputable
6. Some complaints about contractor error or damage during the process
7. Need to know the logistics of when the contractor is planning to install
8. Not always aware of their warranties and don't keep track of them
9. Complaints are common about the noise.
10. Unsure of what to expect.

## 10 Common Homeowner Questions

### 1. How does this look on a roof?

Smog-reducing technology is embedded in the 3M roofing granules and appear just like standard granules on the surface of the shingle or other granule-surfaced roofing materials.

### 2. How does smog-reducing granules work?

The roofing granules are based on the natural nitrogen cycle. As the granules are exposed to UV light, radicals are generated and convert the nitrogen oxides in smog gases into nitrate salts.

### 3. What happens to the salt solids?

The microscopic salt solids are deposited on the roof later to be washed away as a plant usable form of nitrogen.

### 4. What might the salt levels be like from my roof?

Even in the most extreme conditions with a roof containing 100% smog-reducing granules, the capacity of nitrate salt accumulation can be compared to the amount used to lightly fertilize a small garden.

Nitrates are highly soluble allowing them to disperse should they bypass the ground and flow into the wastewater stream directly like many commercial roofing designs.

For the residential shingle application of smog-reducing granules, the most nitrate that could potentially be generated would be similar to the amount of plant food used for a small house plant.

### 5. Can I drink water collected from roof run-off?

It's not recommended to collect roof runoff for drinking water due to the presence of various organic and inorganic chemical sources in the environment.

### 6. Do smog-reducing granules perform differently than standard?

No. The gray smog-reducing granules look the same as standard gray granules. For low slope, they still provide a light-colored solution for granule surfaced materials.

Additionally, you can expect the same quality and performance from these granules, but with an added smog-reducing benefit.

### 7. How do I know if it works, can I test my roof's performance?

3M worked with Lawrence Berkeley National Laboratory to study the efficacy of the product. A test method was developed to expose the product to challenge gases, expose them to UV and measure the results. The testing illustrates the capacity the product has for reducing smog. At this time, there isn't a test method that would enable real-time performance reporting.

### 8. I don't live in a smoggy area, should I bother?

Smog is not just a big city challenge. Smog pollutants primarily get in the air from the burning of fuel, it forms from emissions from cars, trucks, buses, power plants, and off-road equipment.

### 9. Does it wear out?

No. Activity is continuous since the coating is part of the ceramic matrix on the granule. 3M has early prototype products from over 10 years ago on weathering that are still testing active. The catalyst activity is constant when exposed to UV so the smog-reduction activity is a continuous process.

### 10. Am I even making a difference?

Shingles using 3M Smog-reducing granules today have the capacity to reduce smog similar to 2-3 trees for each average roof, 3 trees for every 500 square feet of commercial roofing!



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