

3M Science.
Applied to Life.™

Shingles Featuring Scotchgard™ Protector



Scotchgard™ Protector

Overview

Black streaks caused by algae

- How 3M discovered the origin of black streaks on shingles caused by algae
- Pioneering the solution to resist black streaks
- A day in the life of algae that causes black streaks
- Other roofing ailments

Scotchgard™ Protector shingle system

- How Scotchgard™ Protector can help
- Scotchgard™ Protector shingle system

Black Streaks on Roofs Caused by Algae

Cause of black streaks on roofs investigated in the 1950s



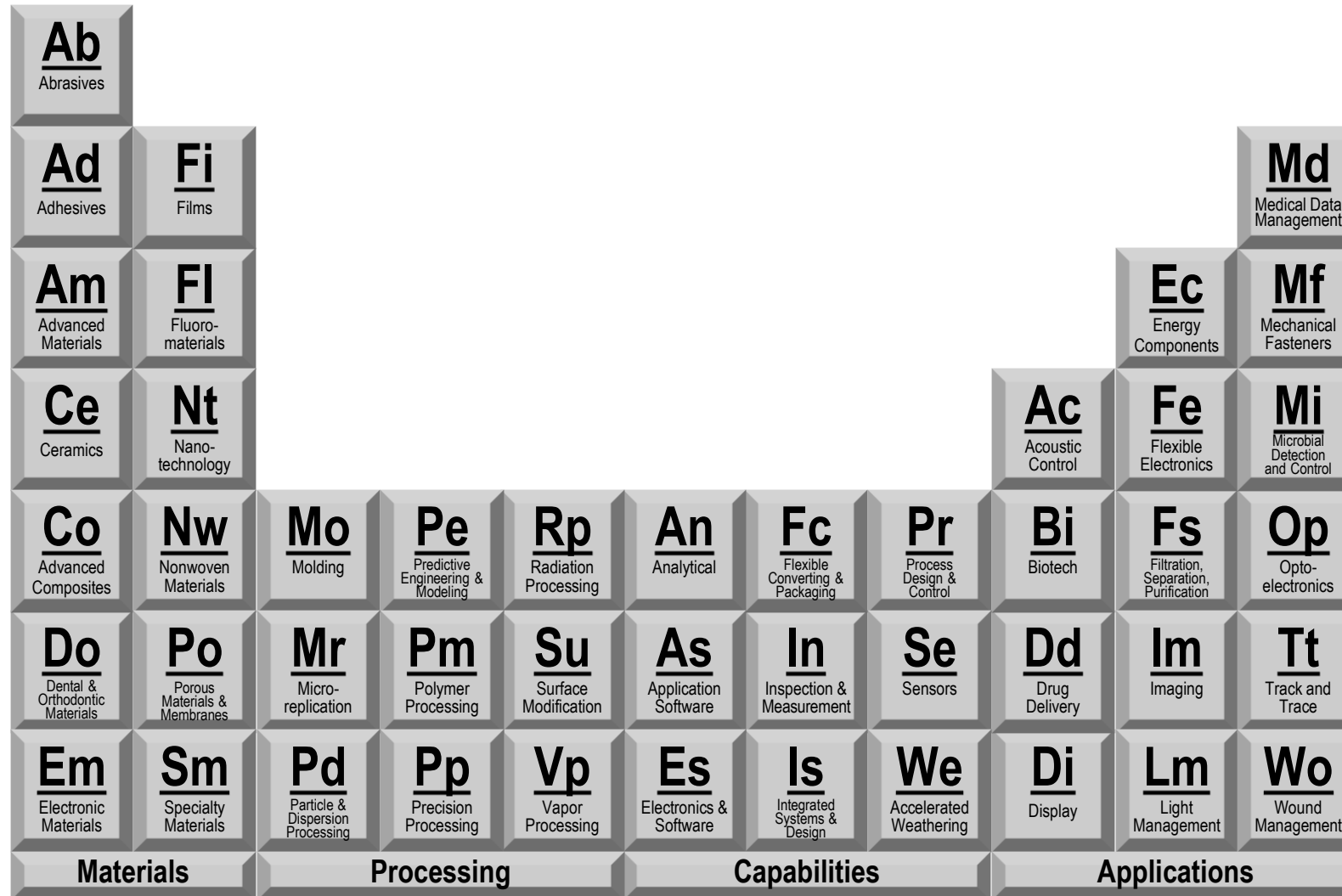
3M scientists and university microbiologists teamed up to uncover the sources of black streaks on shingles.

In the 1960s, a University of Minnesota professor identified the source as a particular algae.

Over the years we learned how black streaks develop, but most importantly, how to help prevent those unsightly black streaks caused by algae.

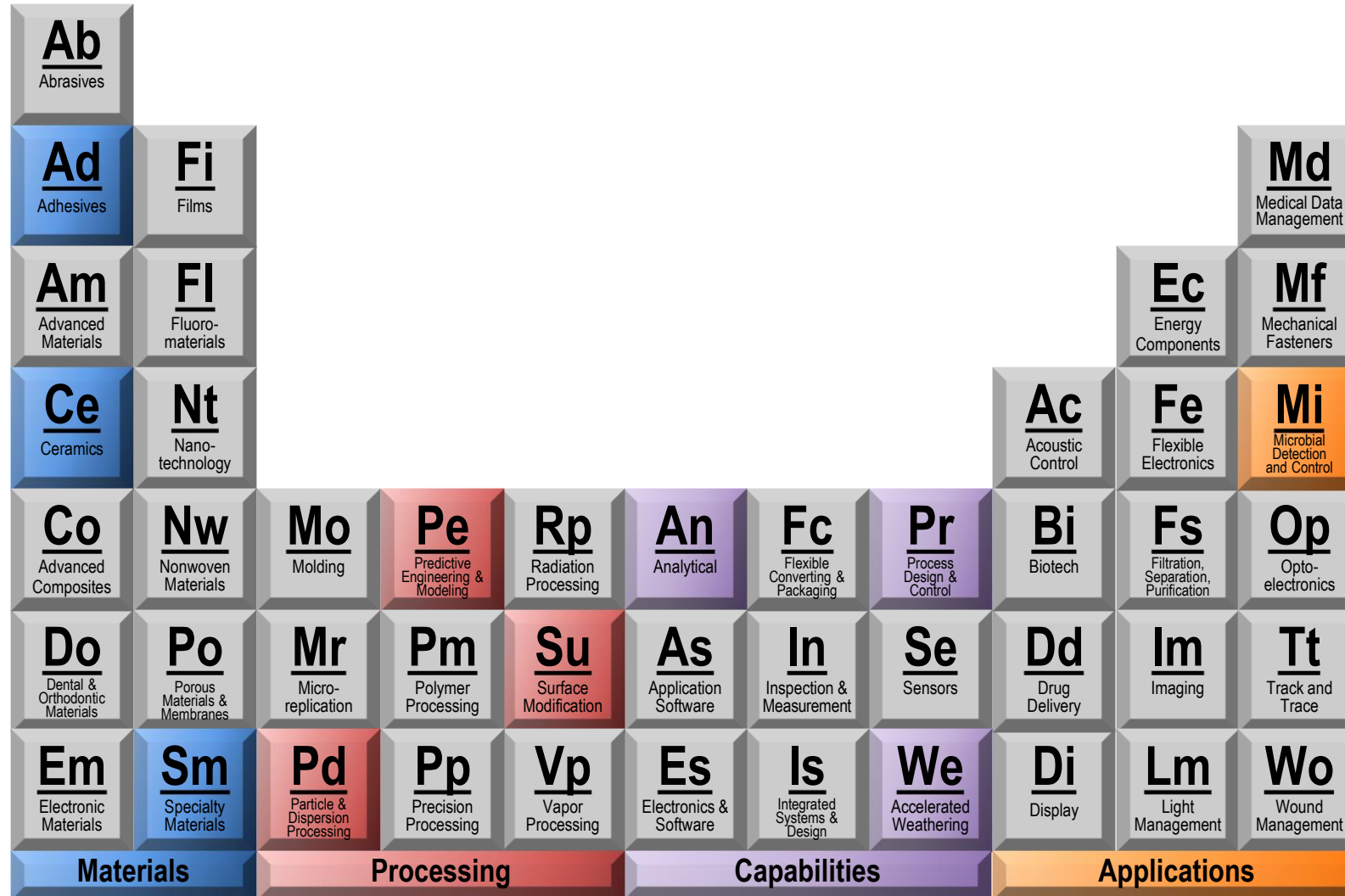
3M receives patent for copper-containing granules

3M activated its scientific know-how and R&D discipline and received its first patent in 1970, for a solution that could resist the black streaks caused by algae.



3M receives patent for copper-containing granules

3M activated its scientific know-how and R&D discipline and received its first patent in 1970, for a solution that could resist the black streaks caused by algae.



Core elements, process steps, capabilities, and applications contribute to the final product



3M copper-containing granules that resist black streaks caused by algae have been sold for over 20 years and earned the Scotchgard™ brand in 2002.

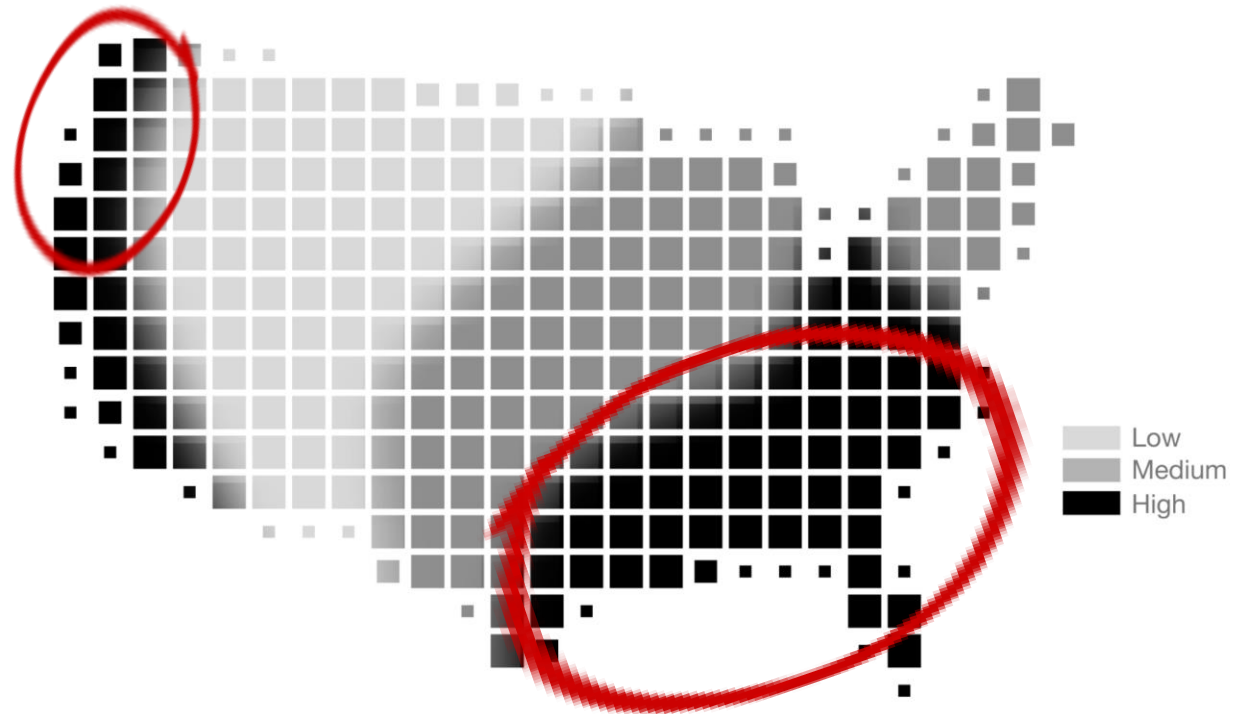
A day in the life of the algae that causes black streaks

Algae thrive in the roof environment:

- They use the sun's energy to grow
- They have protection from the sun's UV rays
- They can withstand long periods without water
- They survive with few nutrients



A 5-year-old roof in Florida. The extent of black streaks caused by algae may vary based on climatic conditions.



Potential for black streaks caused by algae. Based on US average Annual Precipitation and Dew Point Data.

Be mindful of other roofing ailments

Other forms of growths can be found on roofs



Moss growth shown near chimney area



An example of what green algae typically looks like

You create value when you educate your homeowners—be their roofing expert!

Do not overpromise your homeowners that new shingles will solve all their roof ailments. Take pride in knowing that you can present an effective solution to help prevent the black streaks caused by algae.

There are no known shingle systems that can prevent the growth of green algae, moss, or mold.

Shingle maintenance and cleaning

It is a best practice to consult the documentation provided by the shingle manufacturer for recommendations on safe ways to maintain and clean your shingles.



Scotchgard™ Protector Shingle System

The Scotchgard™ Protector shingle system

Helping to prevent the black streaks caused by algae



Shingles featuring Scotchgard™ Protector include:

- ❶ A minimum 10% blend of copper-containing granules incorporated uniformly across the shingle surface.
- ❷ Uniform distribution of copper-containing granules on the shingle and the hip and ridge.
- ❸ Third-party laboratory testing for compliance.
- ❹ A brand you can trust.

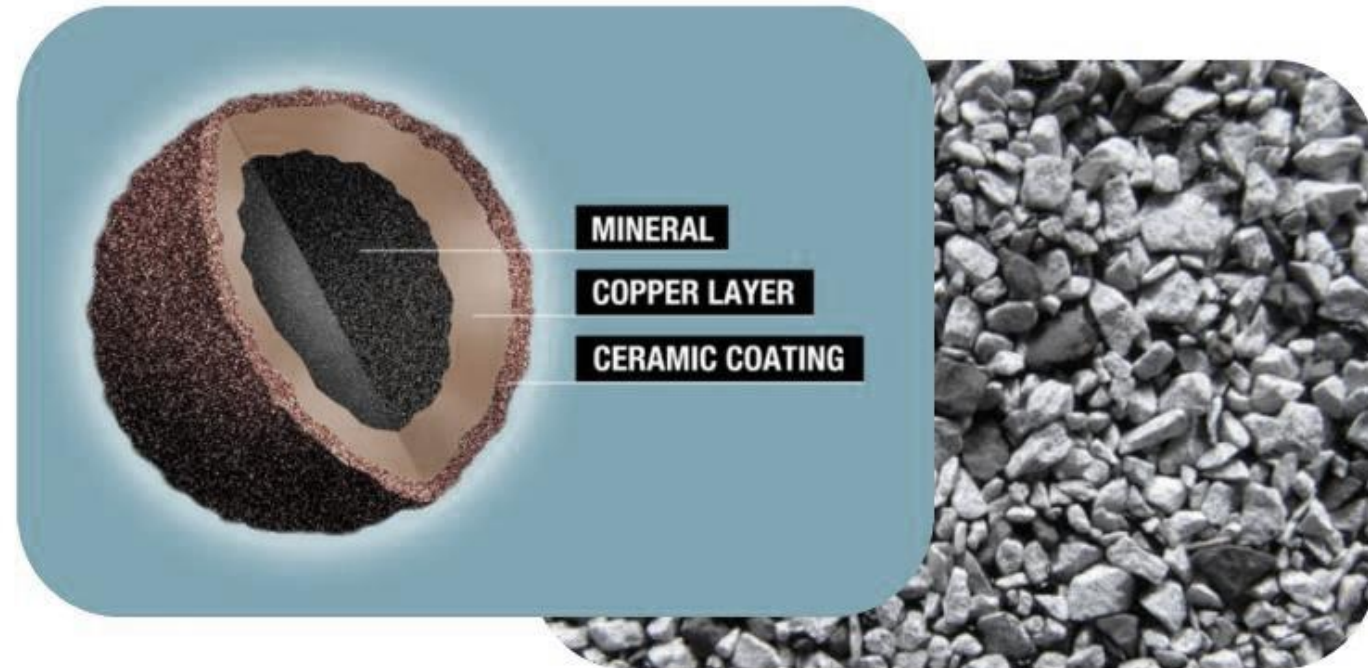


Illustration of a 3M Copper Roofing Granule and nominal 10% granule blend.

The science behind the 3M copper granule

“ The science behind 3M copper-containing granules is based on principles of copper ion leach rates. While the teams experimented with a variety of solutions decades ago using other metals and materials, we discovered copper-containing granules to be a highly effective method to help prevent the black streaks caused by algae and we continue that science today with active research programs on shingle test decks and roofs in a variety of locations. ”

Rachael Gould Ph.D.
Senior Technical Service Specialist
3M Industrial Mineral Products Division

Blend percentage is important to help prevent black streaks

Lower blend percent can result in faster development



6-year-old north facing roof in Florida with no copper present



8-year-old north facing roof in Florida with 6% copper present



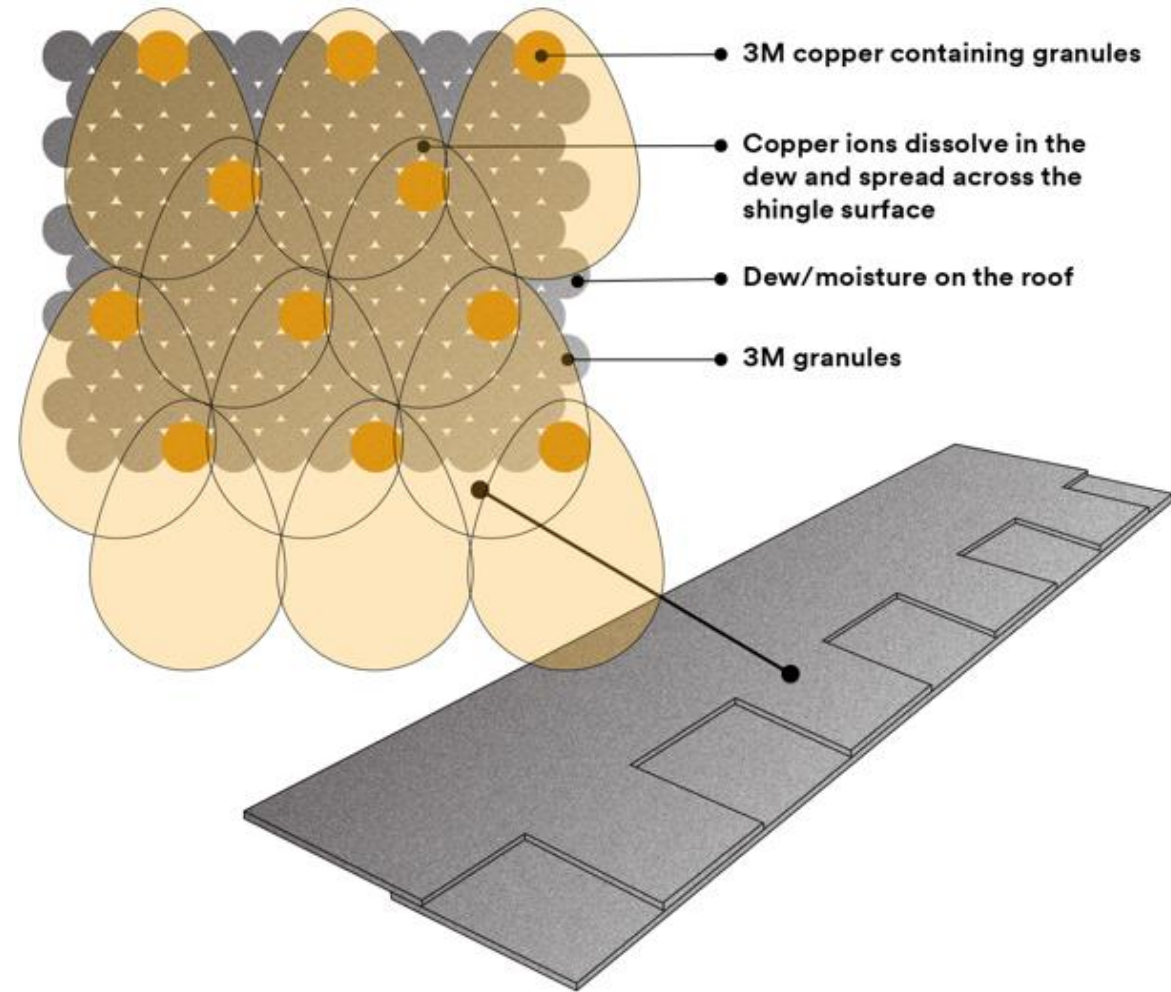
9-year-old north facing roof in Florida with 10% blend of copper

The extent of black streaks caused by algae may vary based on climatic conditions



Why 10% blend is important

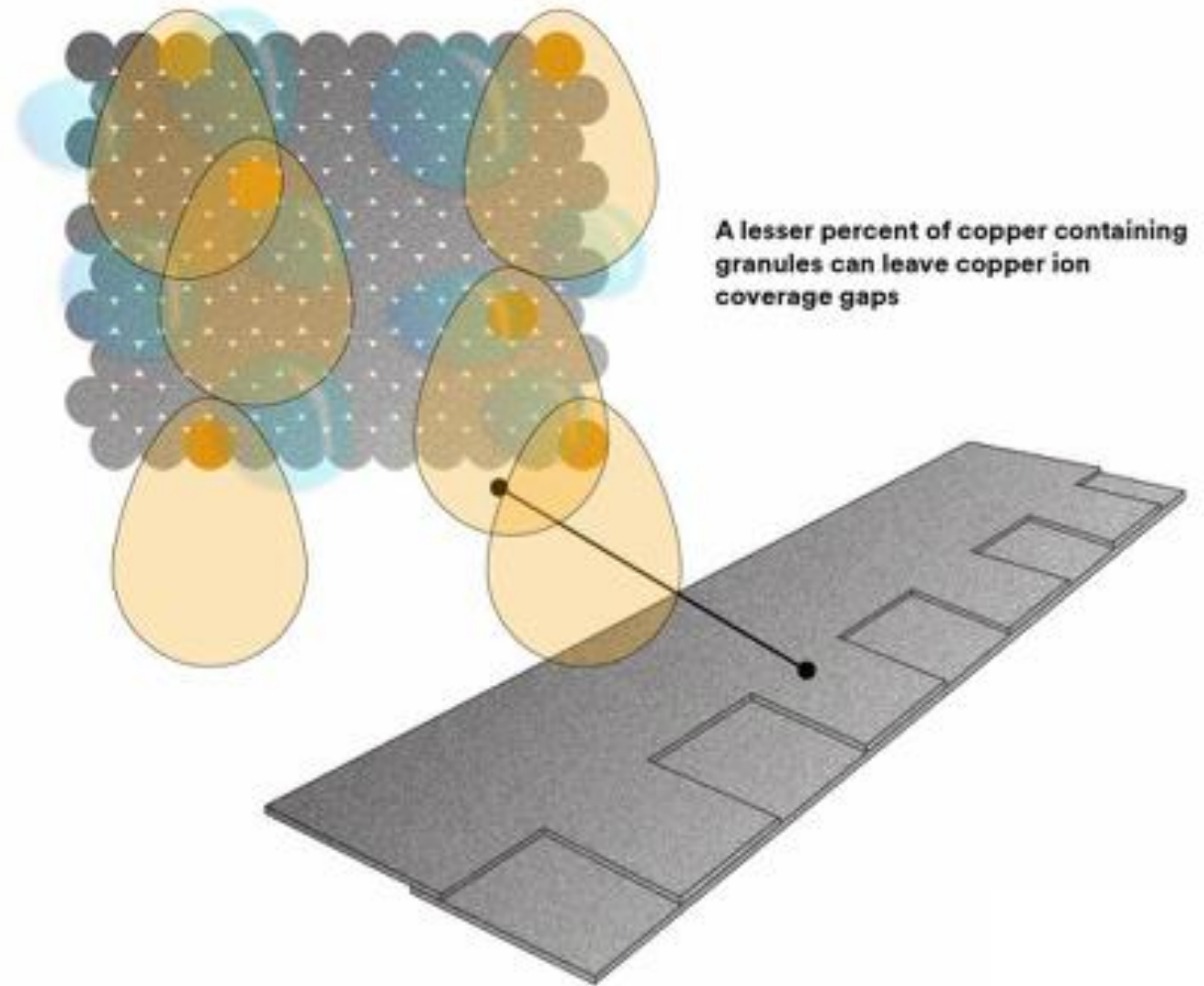
10% blend is important
to help eliminate gaps in
copper ion coverage



Graphic dramatization

Why 10% blend is important

Gaps in copper ion coverage can allow the algae that causes black streaks to get established



Uniform distribution of 3M copper-containing granules

The Scotchgard™ Protector system requires copper-containing granules in all the shingles, including the hip and ridge. The uniform distribution helps prevent any gaps where black streaks caused by algae can get established.



A 10-year-old roof in Florida. An example of shingles where copper is only present in the tooth of the shingle.

The extent of black streaks caused by algae may vary based on climatic conditions.



An 8-year-old roof in Florida. An example of a roof where copper is not present in all the shingles.

The extent of black streaks caused by algae may vary based on climatic conditions.

Third-party laboratory testing

- Each production run of shingles are sampled and tested
- Multiple locations are tested on each sample
- Samples are tested for 10% copper blend and uniform distribution across the shingle surface



Shadow Line



Testing analysis report

Sample Submission Data Form - Shingle Compliance audit		<input type="text"/> = Filled by member	
COMPANY <i>Shingle Manufacturer</i>		<input type="text"/> = Filled by NCH	
ADDRESS			
Contact Name	PHONE	Date Shingles Inspected	
E-mail		<input type="text"/>	

[illegible]

Shingle	
Average	Std Dev
11.3	2.6
11.0	3.0
10.3	2.1
10.3	2.3
10.3	1.7
12.4	2.7

Scotchgard™ Protector is known and used by consumers to protect the things they love



There are Scotchgard™ Protector products for outdoor gear, fabric, carpet, and flooring.

Shingles featuring Scotchgard™ Protector incorporate the right science the right way to help prevent the black streaks caused by algae.

Look for the Scotchgard™ brand



Current logo



New logo

You will begin seeing the new Scotchgard™ logo being introduced over time

Shingles featuring Scotchgard™ are proven to perform

3M has been selling copper-containing granules for over 20 years



A roof in Florida.
Shingles with 0% (left) and a minimum 10% (right) blend copper-containing granules after six years. Results may vary based on climatic conditions.