Thank you for your interest in becoming a Phazebreak certified NEINICE applicator!

In this document and accompanying video, you will learn about NEINICE icephobic coating, its uses, and how to properly apply the product. Upon completion of this certification process, you will be ready to apply NEINICE to turbines in the field.

What is NEINICE?

NEINICE is an icephobic, hydrophobic, impact resistant, self-cleaning coating designed to prevent the formation of ice on wind turbine blades. Its icephobic properties mean that ice cannot easily adhere to the coating, thus reducing the need for maintenance and costly downtime. The coating has been shown to recoup the energy production that is normally lost during in-field ice events.

It is important to note that NEINICE is NOT an LEP coating.

NEINICEis packaged as a three-part kit: Part A, Part B, and Part C. Part A comes in a one gallon can, while Parts B and C come in smaller quart cans. These three parts must be mixed to activate the product.

Considerations Before Application

Weather Conditions

NEINICE must be applied in dry conditions, with temperatures above 0° Celsius or 32° Fahrenheit. Use a surface temperature gauge to ensure ideal temperatures on the blade.

Pot life and Shelf life

NEINICE has a pot life of 30 minutes once mixed and activated. It has a shelf life of 2 years when stored properly at room temperature.

Cure Time

NEINICE becomes tack free in 8-10 hours and requires a cure time of 24 hours before the wind turbine can begin regular operations.

Coverage Area

- A kit of NEINICE can cover roughly 520 sq ft when applied properly
- NEINICE can be applied to all parts of the blade
- Minimum recommended application specifications:
    - The entire leading edge, with 30” coverage on each side of the blade
    - Coat 80% of the length of the blade, beginning at the tip
- NEINICE can be applied over all existing LEPs
- NEINICE should NOT be applied directly over lightning protection systems or sensors. It is best to coat around these.
- NEINICE should not be applied to damaged blades. Ensure that all blades are in working condition before application.

Prepping for Application: Materials and Cleaning

- Ensure that you have the proper safety gear required for the job site. It is recommended that you wear gloves to avoid direct skin contact with NEINICE.
- Have the following items ready for application:
    - NEINICE 3-Part Kit (Parts A, B, and C)
    - Gloves
    - Short knap paint roller
    - Telescoping paint pole
    - Mixing sticks
    - Paint tray or paint grid
    - A 2-gallon bucket (or larger)
    - Painter's tape
    - Cleaning rags
    - Simple Green (or similar)
    - Wet Film Gauge
    - Surface Temperature Gauge
- Before applying NEINICE, the turbine blade must be thoroughly cleaned. It is recommended that applicators use Simple Green (or similar product) and a cleaning rag. Remove all potential contaminants from the area to be coated.
- Do not mix NEINICE before you are ready to coat.

Mixing the 3-Part Kit

1. Ensure you are ready to apply the coating before mixing
2. Pour the entirety of Part B into Part A
3. Pour the entirety of Part C into the Part A and B mixture
4. Stir for 3 minutes
5. The mixture should now appear milky white and drip gently off the mixing stick
6. The coating now has a 30-minute pot life

Applying the Coating

- Using a short nap roller, apply the coating to the intended areas
    - Minimum recommended application specifications:
        - The entire leading edge, with 30" coverage on each side of the blade
        - Coat 80% of the length of the blade, beginning at the tip
- Roll on the coating to a thickness of 2-4 mils – use the wet film gauge to confirm
- Be sure not to over work the coating – roll 1-2 times per area to avoid pulling the coating off
- Once the coating has been applied, allow 24 hours for the coating to cure before resuming normal turbine operations

Certification Test

Now that you have watched the animated explainer and read through the certification document, please demonstrate your understanding of the materials by answering the questions below.

1. Put the steps in order for the application process:
    a. Combine the 3 part kit
    b. Mix thoroughly
    c. Clean the blade
    d. Apply the mixture

2. What do you clean the blade with?

3. What is the minimum temperature for NEINICE application? Can it be applied in rainy or snowy conditions?

4. What is the cure time for NEINICE before turbines can resume regular operation?

5. What type of application method should you use?

6. What is the coverage area of a NEINICE kit?

7. What thickness should you apply the coating at?

8. How many times should you roll over the same patch of coating while applying?

9. Does NEINICE need multiple coatings?

10. Explain the proper mixing order of the 3 part kit and mixing time.

11. What consistency and appearance should NEINICE have if properly mixed?

12. What benefits does NEINICE offer to turbine blades?

13. Once mixed, what is the pot life of NEINICE?

Thank you for completing the Phazebreak Coating Applicator Certification process! Please sign below and submit this document to certification@phazebreak.com for review.

Name:

Signature:

Date: