ELLE® Onshore

Acceptance Criteria

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Wind for life™

General information

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V02	04.07.2025	ELLE™ changed with ELLE®	Jonas Rix Langebæk

Introduction

The acceptance criteria for ELLE® Onshore defines a set of guidelines for the quality requirements necessary to ensure the best performance of ELLE® Onshore. The leading edge of a turbine blade is subjected to environmental stressors, including rain erosion, particle impacts, UV exposure, and temperature fluctuations. These effects can be minimized using ELLE® Onshore.

This document outlines key acceptance criteria for ELLE® Onshore, its application process, possible mitigation and repair strategies and inspection. Critical factors such as blade surface preparation, cleanliness of the blade, and its surroundings, possible contaminants, and application related flaws are covered in this document.

By adhering to the contents of this acceptance criteria the best performance of ELLE® Onshore is achieved.

Printing

If this document is printed it must be printed in color to ensure that the color-marked zones appear correctly.

Abbreviations and Terms

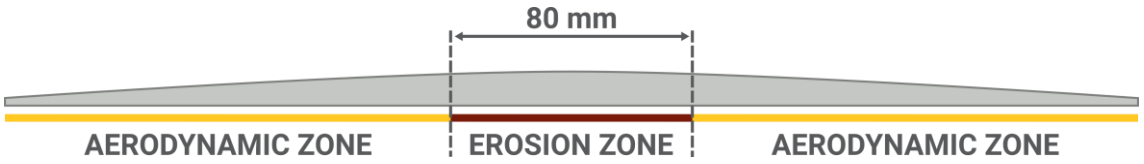
The table below defines the abbreviations and terms used in this document.

Abbreviation / Terms	Change Description
LE	Leading Edge
PSA	Pressure-sensitive adhesive
IPA	Isopropyl alcohol

Contents

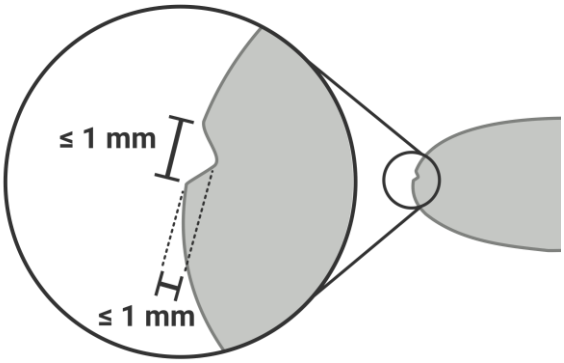
1. Definition of zones

ELLE® Onshore is designed to protect the leading edge against erosion with minimal effect on blade aerodynamics. The product width can be divided into three zones: two aerodynamic zones and one erosion zone. The erosion zone, which is essential for erosion protection, consists of the central 80 mm and corresponds to the area of the center liner. The aerodynamic zones are located on both sides of the erosion zone and do not directly affect the erosion protection properties.



2. Holes in blade surface

Holes in the blade surface within the application area will reduce the performance of ELLE® Onshore. Holes in the substrate should be avoided. Holes are acceptable if diameter and depth are equal to or below 1 mm.



Mitigation

Holes observed in the application area of ELLE® Onshore shall be filled with a filler and subsequently sanded and cleaned.

Repair

If ELLE® Onshore is applied on top of a hole in the blade surface it shall be removed and the hole repaired before applying a new piece of ELLE® Onshore. Holes are acceptable if diameter and depth are equal to or below 1 mm.

3. Sanding of installation area

Care should be taken to ensure that the whole installation area is sanded and any smaller variations in the position during installation of ELLE® Onshore is accounted for in the sanding area.

Mitigation

Ensure that the installation area for ELLE® Onshore is sanded at least 10 mm outside the installation area of ELLE® Onshore.

Repair

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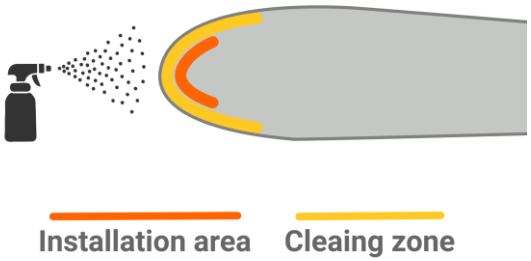
4. Dust & Debris

Care should be taken to avoid contaminating the PSA of ELLE® Onshore and the blade installation area. A clean surface should be used when handling ELLE® Onshore and during installation it is recommended wearing clean gloves. Cleaning the blade and the surroundings will decrease the risk of contaminating the PSA with dust & debris. It is recommended that a larger area of the blade is cleaned prior to installation of ELLE® Onshore, as there is a risk that dust & debris on the blade can lead to contamination of the PSA.



Mitigation

Ensure that the blade and surrounding areas are kept clean prior to installation of ELLE® Onshore. Using IPA to clean the blade surface prior to application is essential to avoid contamination of dust and debris.

Repair

If the PSA is contaminated with dust & debris, it shall be replaced with a new piece of ELLE® Onshore.

5. Foreign objects

Foreign objects located between the blade and ELLE® Onshore will reduce the adhesion of the PSA and reduce the performance of ELLE® Onshore. Foreign objects could be:

- Smaller fiberglass particles from trimming and handling of composite materials
- Insects
- Hair or textile fibers
- Residue of masking tape
- Oil & Grease from tools, machinery or human contamination

Mitigation

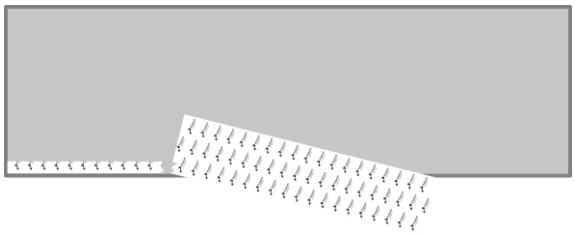
Ensure that the blade and surrounding areas are kept clean prior to installation of ELLE® Onshore. Vacuum cleaning the surroundings and using IPA to clean the blade surface prior to application is essential to avoid contamination of foreign objects.

Repair

If the PSA is contaminated with foreign objects, it shall be replaced with a new piece of ELLE® Onshore

6. Residual liner fragments

ELLE® Onshore comes with a plastic liner used to protect the PSA prior to being installed. Care should be taken to ensure that all liner is removed before installing ELLE® Onshore. Be aware of rupture of the liner as this indicates the possibility of residual liner fragments on the PSA. Smaller liner fragments can be present after cutting the tip section, so extra attention is needed in the tip area.



Mitigation

Visually inspect the PSA during application and especially in the case where a rupture of the liner is identified. Special attention should be made to the tip area after cutting.

Repair

If liner is identified on the PSA the liner shall be removed immediately.

7. Self-adherence

Care should be taken to ensure ELLE® Onshore is applied without adhering to itself. Self-adherence of ELLE® Onshore occurs when the PSA side comes into contact with itself and sticks together. This will cause a wrinkle in ELLE® Onshore and affect the performance.

Mitigation

Visually inspect ELLE® Onshore during application and ensure that application solution is used during installation.

Repair

If self-adherence is identified during application these shall be removed immediately. If wrinkles caused by self-adherence are identified after application these shall be replaced with a new piece of ELLE® Onshore.

8. Air or water entrapments

Air or water entrapments within the application area will reduce the performance of ELLE® Onshore. Air or water entrapments should be avoided.

Mitigation

Air or water entrapments created during application should be removed immediately by lifting and reapplying ELLE® Onshore.

Repair

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Reference Documents

LE-D043	ELLE® Onshore Technical Data Sheet
LE-I038	Application of ELLE® Onshore Up-tower Installation
LE-I058	Application of ELLE® Onshore Factory Installation
LE-I057	Repair of ELLE® Onshore