

## REPAIR INSTRUCTION

# ELLE® Shells Repair of Detachment

|                    |              |
|--------------------|--------------|
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## Imprint

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## Table of Content

|                                                    |           |
|----------------------------------------------------|-----------|
| <b>1. General Information .....</b>                | <b>4</b>  |
| 1.1 Change Description .....                       | 4         |
| 1.2 Safety .....                                   | 5         |
| 1.2.1 Qualifications of Personnel .....            | 5         |
| 1.2.2 PPE (Personal Protective Equipment) .....    | 5         |
| 1.3 Icons and Notes .....                          | 5         |
| 1.4 Required Documentation .....                   | 6         |
| 1.5 Abbreviations .....                            | 6         |
| <b>2. Preparation .....</b>                        | <b>7</b>  |
| 2.1 Environmental Conditions .....                 | 7         |
| 2.2 Tools and Consumables .....                    | 7         |
| <b>3. Repair .....</b>                             | <b>8</b>  |
| 3.1 Loosening of ELLE® Edge in Affected Area ..... | 8         |
| 3.2 Removal of Sealant .....                       | 8         |
| 3.3 Cleaning of Surface .....                      | 9         |
| 3.4 Preparation of Surface and ELLE® .....         | 9         |
| 3.5 Application of Masking Tape .....              | 10        |
| 3.6 Application of Sealant .....                   | 10        |
| 3.7 Squeezing of Sealant .....                     | 10        |
| 3.8 Cleaning of ELLE® .....                        | 11        |
| 3.9 Smoothing of Sealant .....                     | 11        |
| 3.10 Curing Time .....                             | 12        |
| <b>4. Technical Support .....</b>                  | <b>13</b> |

# 1. General Information

## 1.1 Change Description

The table below describes changes compared to the previous revision of the document.

| Section                           | Description                                                                   |
|-----------------------------------|-------------------------------------------------------------------------------|
| <b>Version 3.0</b>                |                                                                               |
| Document name                     | Rename document to: <i>LE-I003 3.0_en ELLE® Shells Repair of Detachment</i> . |
| Section 1.4                       | Updating section: <i>Installation Instruction</i>                             |
| Section 3.1 Step 1&2              | Text update and a Note inserted. Step 2 removed                               |
| Section 3.2 Step 1                | Updating text and move text from Step 3 to Step 1. Remove Step 2 & 3.         |
| Section 3.3 Step 1                | Move text from Step 2 & 3 to Step 1. Remove Step 2 & 3.                       |
| Section 3.5 Step 1                | Move text from Step 2 to Step 1. Remove Step 2                                |
| Section 3.6 Step 1                | Move text from Step 2 to Step 1. Remove Step 2                                |
| Section 3.7 Step 1                | Move text from Step 2 to Step 1. Remove Step 2                                |
| Section 3.9 Step 1                | Move text from Step 2 to Step 1. Remove Step 2                                |
| <b>Version 2.0</b>                |                                                                               |
| All                               | New template.<br>Various editorial changes throughout.                        |
| <u>1.3 Icons and Notes</u>        | New section added.                                                            |
| <u>1.4 Required Documentation</u> | <i>LE-Q003 ELLE® Shells Acceptance Catalog Installation</i> added.            |
| <u>2.2 Tools and Consumables</u>  | <b>Tools:</b> Type of application squeegee changed to Special Polytech tool.  |
| 3.1 Function Description          | Section deleted.                                                              |
| 3.2 Technical Data                | Section merged with <u>2.1 Environmental Conditions</u> .                     |
| <u>3.10 Curing Time</u>           | Information regarding release of rotor and WTG idle mode added.               |
| All                               | New document ( <b>Version 1.0</b> )                                           |

## 1.2 Safety

### 1.2.1 Qualifications of Personnel

The table below defines which tasks can be assigned to qualified, trained and instructed personnel.

| Task                    | Personnel                                                                                                                                                                                                                                                                  |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| All                     | Qualified personnel <ul style="list-style-type: none"> <li>■ Personnel who, based on their specialist training, knowledge and experience and knowledge of the relevant regulations, are able to assess the work assigned to them and identify possible hazards.</li> </ul> |
| Installation            | Trained personnel <ul style="list-style-type: none"> <li>■ Personnel trained in the operation and safe use of the product.</li> </ul>                                                                                                                                      |
| Packaging and Transport | Instructed personnel <ul style="list-style-type: none"> <li>■ Personnel instructed in the tasks assigned to them.</li> </ul>                                                                                                                                               |

### 1.2.2 PPE (Personal Protective Equipment)

Wear PPE as defined in the table below.

|                                                                                     |                                                                                                                                                                                |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | <b>For all tasks</b><br>Wear foot protection.                                                                                                                                  |
|  | <b>For all tasks</b><br>Wear eye protection.                                                                                                                                   |
|  | <b>For all tasks</b><br>Wear protective gloves.                                                                                                                                |
|  | <b>For tasks where sufficient venting is not possible</b><br>Wear respiratory protection. <ul style="list-style-type: none"> <li>■ Recommended filter type: A2, P2.</li> </ul> |

## 1.3 Icons and Notes

The table below defines the meaning of icons that appear in this document.

| Icon                                                                                | Definition                                                          |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|
|  | <b>Caution or Warning</b><br>Details about risk of personal injury. |
|  | <b>Note</b><br>Details about risk of property damage.               |
|  | Reference to additional documentation.                              |
|  | Details about time constraints.                                     |

## 1.4 Required Documentation

The table below lists other required documentation.

|                                 |                                                                                                                                                                                                                                                       |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Safety Data Sheet</b>        | <ul style="list-style-type: none"> <li>■ CENTAUR 960 SDS</li> <li>■ IPA Sprit 99,9% Polytech</li> <li>■ Sika® Aktivator-205</li> </ul>                                                                                                                |
| <b>Technical Data Sheet</b>     | <ul style="list-style-type: none"> <li>■ PolyTech TDS Centaur 960</li> <li>■ PolyTech TDS ELLE®</li> <li>■ Sika® Aktivator-205</li> </ul>                                                                                                             |
| <b>Installation Instruction</b> | <ul style="list-style-type: none"> <li>■ LE-Q003 ELLE® Shells Acceptance Catalog Installation</li> <li>■ LE-I002 ELLE® Shells Replacement</li> <li>■ LE-I006 ELLE® Shells Surface Preparation</li> <li>■ LE-I007 ELLE® Shells Installation</li> </ul> |

## 1.5 Abbreviations

The table below defines the abbreviations used in this document.

| <b>Abbreviation</b> | <b>Full Form</b>              |
|---------------------|-------------------------------|
| ELLE®               | Everlasting Leading Edge      |
| IPA                 | Isopropanol Alcohol           |
| PPE                 | Personal Protective Equipment |
| SDS                 | Safety Data Sheet             |
| TDS                 | Technical Data Sheet          |
| WTG                 | Wind Turbine Generator        |

## 2. Preparation

### 2.1 Environmental Conditions

The table below defines the temperature and humidity requirements during repair.



Refer to Technical Data Sheets for storage and transportation requirements.

| Property                    | Value      | Unit |
|-----------------------------|------------|------|
| Ambient temperature         | 5 ... 35   | °C   |
|                             | 41 ... 95  | °F   |
| Surface temperature:        | 5 ... 50   | °C   |
|                             | 41 ... 122 | °F   |
| Permitted relative humidity | 30 ... 90  | %    |

### 2.2 Tools and Consumables

| Tools                |                                        |
|----------------------|----------------------------------------|
| Item                 | Type                                   |
| Application gun      | -                                      |
| Application squeegee | Plastic spatula, special Polytech tool |
| Consumables          |                                        |
| Item                 | Type                                   |
| Adhesive             | Centaur 960                            |
| Cleaning agent       | Isopropanol 99.9%                      |
| Cloths               | Lint-free                              |
| Masking tape         | -                                      |
| Sandpaper            | Grit 220 to 240                        |
| Surface activator    | Sika® Aktivator-205                    |

### 3. Repair

#### 3.1 Loosening of ELLE® Edge in Affected Area

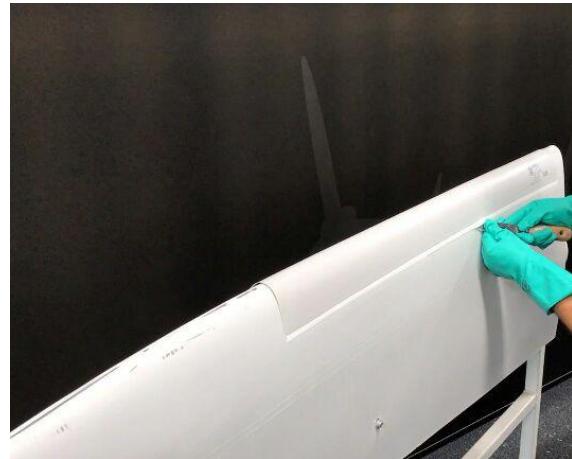
##### Step 1

Release edge of ELLE® gently using a putty knife.



##### Note

Be careful not to damage the ELLE® when loosening it. Ensure that the edge of ELLE® is loosened for the whole area of the blade where ELLE® have detached from the blade.



End

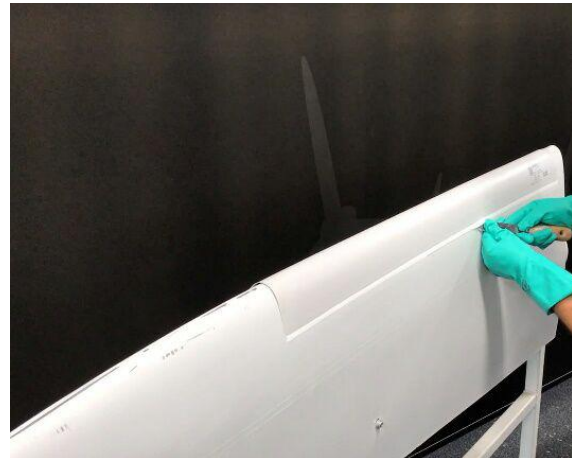
#### 3.2 Removal of Sealant

##### Step 1

Use a putty knife or chisel to remove the sealant from the surface of the blade area where ELLE® has been released.

Be careful not to damage the blade surface.

Remove the sealant that is left on the inside of ELLE® with sandpaper grit 220 to 240 and make sure that all loose sealant is removed.



End

### 3.3 Cleaning of Surface

#### Step 1

Clean the entire surface of the blade and ELLE® where it has been released.

- Use isopropanol and a damp cloth to clean the surface.
- Make sure that whole area of the repair is fully cleaned.



**End**

### 3.4 Preparation of Surface and ELLE®

#### Before Starting



**Note**

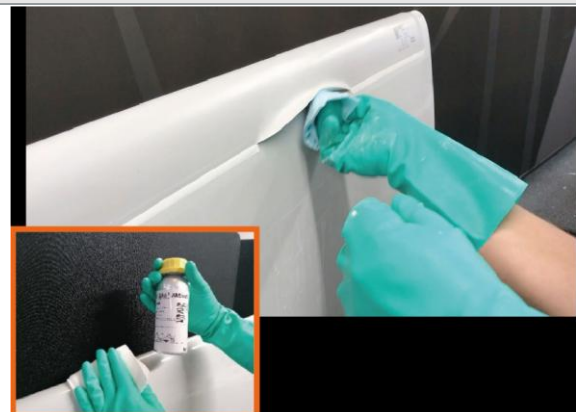
Wear clean, powder-free nitril gloves when handling ELLE®.

#### Step 1

Wipe ELLE® and the blade surface in the entire area that have been released Sika® Aktivator-205, using a damp cloth.



Wait between 10 and 120 minutes for the Sika® Aktivator-205 to evaporate before continuing.

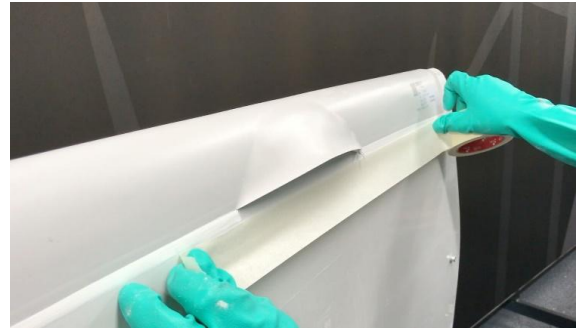


**End**

### 3.5 Application of Masking Tape

#### Step 1

Place masking tape along the edge of ELLE®. Ensure 10±5 mm distance to the outline of ELLE®.



**End**

### 3.6 Application of Sealant

#### Step 1

Place the nozzle under the ELLE® shell to seal the prepared area.

- The nozzle tip must be placed where ELLE® is still fully attached to the blade surface.
- Place a thick layer of Centaur 960 close along the line where ELLE® is still fully attached to the blade.



**End**

### 3.7 Squeezing of Sealant

#### Step 1

Smoothen out the sealer, moving the application squeegee in longitudinal direction, starting closest to the leading edge of the sealed area.

Use the application squeegee in a downward movement, squeezing the sealer towards the edge of ELLE®.

- More sealant can be applied for the chamfer if there is not enough to make a smooth transition from ELLE® to blade.



**End**

### 3.8 Cleaning of ELLE®

#### Step 1

Remove excess of sealer from the surface of the installed ELLE® section, using isopropanol and a damp cloth.



**End**

### 3.9 Smoothing of Sealant

#### Step 1

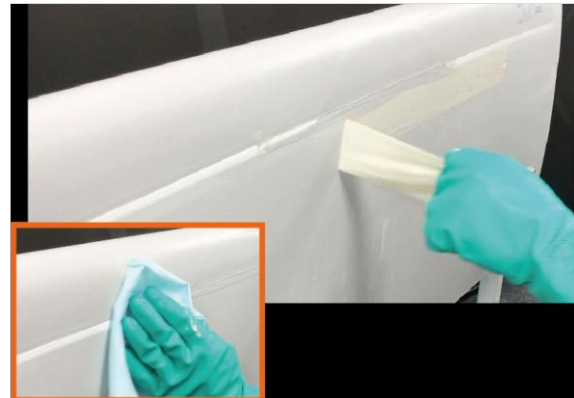
Remove the masking tape and even out raised sealant, if any.

For smoothing, spray isopropanol onto the sealant and use a cloth moistened with isopropanol.



Make sure the edge of the sealant is not compressed thinner than the edge of ELLE®.

If there is a small difference, smooth the bonding line between ELLE® and sealant with light finger strokes after wetting sealer with isopropanol.



**End**

### 3.10 Curing Time

The rotor can be released and the WTG set to idle mode immediately after application of the replacement ELLE®. The replacement ELLE® must cure in accordance with the table below before the WTG can be put into operation.

| Relative Humidity [%] | Temperature [°C] | Temperature [°F] | Minimum curing time [hours] |
|-----------------------|------------------|------------------|-----------------------------|
| > 30                  | 5 ... 10         | 41 to 50         | 12                          |
| > 30                  | 10 ... 15        | 50 to 59         | 9                           |
| > 30                  | 15 ... 20        | 59 to 68         | 7                           |
| > 30                  | 20 ... 25        | 68 to 77         | 5                           |
| > 30                  | 25 ... 30        | 77 to 86         | 4                           |
| > 30                  | 30 ... 35        | 86 to 95         | 3                           |
| > 30                  | 35 ... 40        | 95 to 104        | 2                           |

## 4. Technical Support

### E-mail

[support@polytech.com](mailto:support@polytech.com)

Answers will be sent within one working day.

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Please include the following information in your support request:

- Product name.
- Product type.
- Serial number.
- Description of the problem, including detailed, high-resolution pictures.