




DEXPAND®-CF70

Notes



- The product may only be applied by specialist personnel trained by DENSO GmbH.
- Ensure that the pipeline section is freely accessible from all sides.
- Sharp shot must be used in the blasting process for rust removal.
- The pipeline section must be coated with **DEXPAND®-CF70** immediately after blasting and no more than two hours later.
- Shake component B (Primer and Wetout) well before each use.
- Start the processing of the resin components **IMMEDIATELY** after mixing
- DEXPAND®-CF70 may only be deaerated using **aeration rollers with horizontal ribbing** (aluminium or Teflon).
- Each **DEXPAND®-CF70 Carbon fabric** layer must be individually soaked and applied immediately. (Use a new velour laminating roller and a new container of DEXPAND®-CF70 Wetout for each length of fabric).
- Empty each mixed 2K container completely immediately after use.
- NEVER close a once mixed 2 component container** due to possible strong heat generation.
- When applying DEXPAND®-CF70 fabric, a symmetrical overlap of the defect must be made in the longitudinal direction.**

1. Cleaning



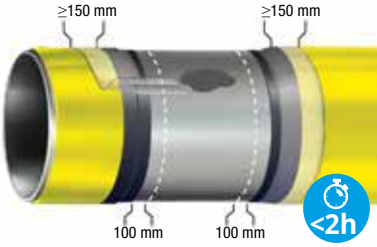
- Remove existing coatings to a width of approx. 200 mm wider than the width to be coated with **DEXPAND®-CF70 Carbon fabric**.
- Chamfer the edges of the factory coating to an angle of $<30^\circ$.
- Remove surface deposits such as dust, dirt, oil or grease.

2. Blasting



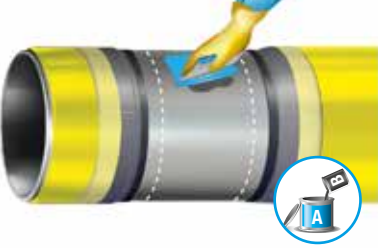
- Use sharp shot to blast the surface.
- Blast the entire exposed steel area with at least Sa2½ (ISO8501-1), roughness depth 40–100 µm.**
- Roughen the factory coating using an abrasive cloth (#40), rubbing in a peripheral direction across a width of approx. 150 mm.

3. Marking tapes and stretch foil



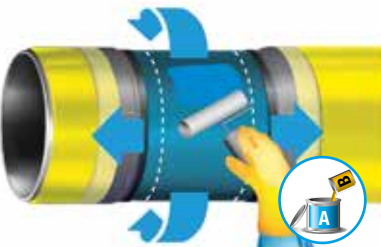
- Mark out the length of pipeline to be coated (the total width of the **DEXPAND®-CF70 Carbon fabric** plus 100 mm) by applying **marking tape** around the entire circumference of the pipe.
- Using **stretch foil**, cover the area from the centre of the marking tape to 150 mm into the factory coating.
- No more than 2 hours** may elapse between completion of the rust removal process and the start of the DEXPAND®-CF70 system coating process. Care must be taken to ensure that the surface is not contaminated, for example when additional stretch foil is applied.

4. Fill any damaged areas with DEXPAND®-CF70 Putty



- If necessary, warm the surface to be coated to within the DEXPAND®-CF70 processing temperature range.
- The surface temperature must also be at least $+3^\circ\text{C}$ ($+5,4^\circ\text{F}$) above dew point.
- Mix a full **DEXPAND®-CF70 Putty** container (components A-blue + B-black) until the mixture is a homogeneous colour with no marbling or streaks.
- Transfer the mixture to a clean container, e.g. a plastic tub, and thoroughly mix again.
- Never mix partial containers!**
- Fill the damaged area and use a spatula to smooth the putty in a peripheral direction until it is **free of air pockets and flush** with the pipe surface.
- For areas of deep defects, apply multiple layers. Smooth each layer to a **thickness of no more than 3 mm in each step**. Once each layer is complete, proceed immediately to the next layer.

5. Application of DEXPAND®-CF70 Primer



- If necessary, warm the surface to be coated to within the DEXPAND®-CF70 processing temperature range.
- The surface temperature must also be at least $+3^\circ\text{C}$ ($+5,4^\circ\text{F}$) above dew point.
- Shake the **DEXPAND®-CF70 Primer** container thoroughly before use. Mix a full primer container (components A-blue + B-yellow) **for at least 3 minutes** until the mixture is a homogeneous colour with no marbling or streaks. Also mix vertically and at the sides from the edge of the container. Regularly wipe your stirring tool.
- Never mix partial containers!**
- Apply **DEXPAND®-CF70 Primer** in a thin, even layer across the entire surface using a velour laminating roller or a laminating brush, also covering any damaged areas filled with **DEXPAND®-CF70 Putty** (take special care in such areas).

CAUTION: Do not apply a thicker layer of primer than necessary, as doing so may cause the DEXPAND®-CF70 laminate to slip during wrapping.

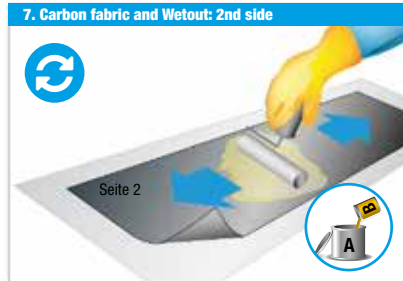


DEXPAND®-CF70



6. Carbon fabric and Wetout: 1st side

- Roll out **DEXPAND®-CF70 Carbon fabric** segment by segment without any creases on a smooth, clean surface covered with a plastic tarpaulin. Check the fabric for any misplaced fibres or other irregularities.
- Shake the **DEXPAND®-CF70 Wetout** container thoroughly before use. Mix a Wetout container (components A-colourless + B-yellow) **for at least 3 minutes** until the mixture is a homogeneous colour with no marbling or streaks. Also mix vertically and at the sides from the edge of the container. Regularly wipe your stirring tool.
- Never mix partial containers!**
- Use the wide **velour laminating roller** to evenly apply **DEXPAND®-CF70 Wetout**.
- Then use the **aeration roller** to roll out the length of fabric and remove any air pockets (**do not use a spiked or bristled roller**).
- Do not damage the fabric or move any fibres.
- For fabric lengths **>2m**, it may be advisable to roll the fabric carefully and avoiding any creases onto a sufficiently wide cylinder such as a cardboard or plastic tube. The cylinder, **for single use only**, must be clean, dry and free from grease.



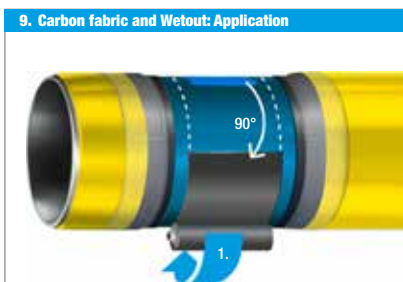
7. Carbon fabric and Wetout: 2nd side

- Carefully **turn** the **DEXPAND®-CF70 Carbon fabric** and roll out without any creases.
- For fabric lengths **> 2m** that have been rolled up, unwind in segments and lay out without creases, so that the side that has not been soaked so far is on top
- Use the wide **velour laminating roller** to evenly apply **DEXPAND®-CF70 Wetout**.
- Then use the aeration roller to roll out the length of fabric and remove any air pockets (**do not use a spiked or bristled roller**).
- Do not damage the fabric or move any fibres.



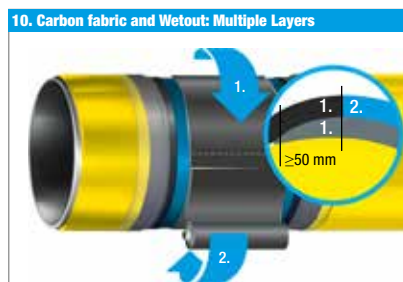
8. Carbon fabric and Wetout: Rolling

- Working carefully and avoiding any creases, roll the **DEXPAND®-CF70 Carbon fabric** onto a sufficiently wide cylinder such as a cardboard or plastic tube. (The cylinder must be clean, dry and free from grease).
- Commence application immediately after rolling.**
- Only soak the **subsequent layers** of **DEXPAND®-CF70 Carbon fabric** in **DEXPAND®-CF70 Wetout** once the application of the previous prepared layer is complete.
- Use a **new velour laminating roller** to soak each **DEXPAND®-CF70 Carbon fabric** layer.



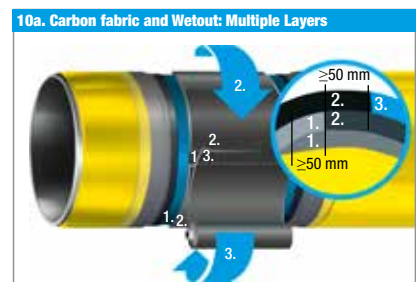
9. Carbon fabric and Wetout: Application

- Carefully apply **DEXPAND®-CF70 Carbon fabric** in the marked area.
- Position **DEXPAND®-CF70 Carbon fabric** at an angle of approx. 90° in circumferential direction to the damaged area or offset from the damaged area by 1/4 of the pipe circumference.
- Apply slight tension when wrapping **DEXPAND®-CF70 Carbon fabric** to ensure a secure hold and to eliminate creasing.
- Apply **DEXPAND®-CF70 Carbon fabric** without any offset, overlapping the ends by at least 50 mm, so that the fabric does not end on the defect.
- If the required number of layers is achieved with one fabric, use finally the **aeration roller** to roll out the length of fabric and remove any air pockets (**do not use a spiked or bristled roller**).



10. Carbon fabric and Wetout: Multiple Layers

- If applying multiple layers of **DEXPAND®-CF70 Carbon fabric** on top of one another, proceed carefully and align the edges.
- Position **DEXPAND®-CF70 Carbon fabric** at an angle of approx. 90° in circumferential direction to the damaged area or offset from the damaged area by 1/4 of the pipe circumference.
- Apply slight tension when wrapping **DEXPAND®-CF70 Carbon fabric** to ensure a secure hold and to eliminate creasing without causing previously applied layers to move out of place.
- Apply **DEXPAND®-CF70 Carbon fabric** without any offset, overlapping the ends by at least 50 mm.
- Start the next length of **DEXPAND®-CF70** as **soon as** the previous length runs out; ensure that the **edges are aligned**. If the length of the following sheet is not sufficient for a complete wrap of the pipe – plus the additional overlap of at least 50 mm, the following sheet shall be placed on the previous sheet with an overlap of at least 50 mm.
- Always wrap the fabric in the **same direction**.
- Then use the **aeration roller** to roll out the length of fabric and remove any air pockets (**do not use a spiked or bristled roller**).

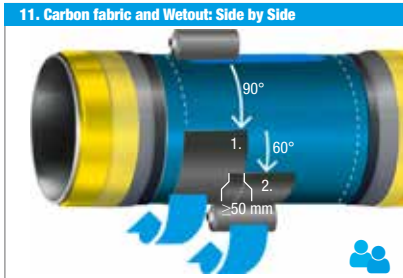


10a. Carbon fabric and Wetout: Multiple Layers

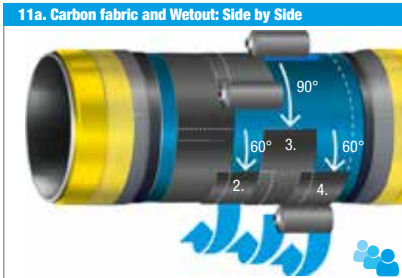
- Apply any additional **DEXPAND®-CF70 Carbon fabric** required in the same way as in point 10, starting as follows:
- Start the next length of **DEXPAND®-CF70** as **soon as** the previous length runs out; ensure that the **edges are aligned**. If the length of the following sheet is not sufficient for a complete wrap of the pipe – plus the additional overlap of at least 50 mm, the following sheet shall be placed on the previous sheet with an overlap of at least 50 mm.
 - Always wrap the fabric in the **same direction**.
 - Then use the **aeration roller** to roll out the length of fabric and remove any air pockets (**do not use a spiked or bristled roller**).



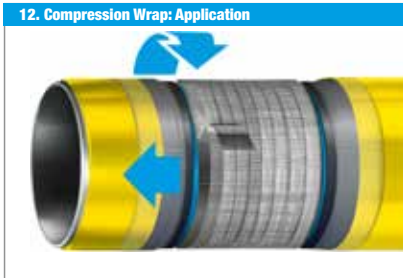
DEXPAND®-CF70



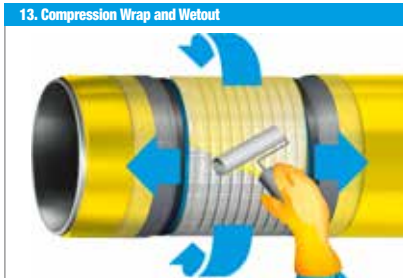
- If the required repair width cannot be covered with one DEXPAND®-CF70 Carbon fabric, additional single fabrics can be applied overlapping next to each other.
- Carefully apply DEXPAND®-CF70 Carbon fabric in the marked area.
- Position DEXPAND®-CF70 Carbon fabric at an angle of approx. 90° in circumferential direction to the damaged area or offset from the damaged area by 1/4 of the pipe circumference.
- Apply the start and end of each length of DEXPAND®-CF70 with an offset of approx. 60°.
- Apply slight tension when wrapping DEXPAND®-CF70 Carbon fabric to ensure a secure hold and to eliminate creasing without causing previously applied layers to move out of place.
- Apply DEXPAND®-CF70 Carbon fabric without any offset, overlapping the ends by at least 50 mm.
- Apply DEXPAND®-CF70 Carbon fabric without any offset, overlapping the sides by at least 50 mm.
- Always wrap the fabric in the same direction.
- Then use the **aeration roller** to roll out the length of fabric and remove any air pockets (**do not use a spiked or bristled roller**).
- **Caution:** Apply adjacent lengths in parallel layers ("zip principle"). Do not apply each length separately.



- Apply each additional, adjacent DEXPAND®-CF70 Carbon fabric in the same way as in point 11, as follows:
 - Carefully apply DEXPAND®-CF70 Carbon fabric in the marked area.
 - Position DEXPAND®-CF70 Carbon fabric at an angle of approx. 90° in circumferential direction to the damaged area or offset from the damaged area by 1/4 of the pipe circumference.
 - Apply the start and end of each length of adjacent DEXPAND®-CF70 with an offset of approx. 60°.
 - Apply slight tension when wrapping DEXPAND®-CF70 Carbon fabric to ensure a secure hold and to eliminate creasing without causing previously applied layers to move out of place.
 - Apply DEXPAND®-CF70 Carbon fabric without any offset, overlapping the ends by at least 50 mm.
 - Apply DEXPAND®-CF70 Carbon fabric without any offset, overlapping the sides by at least 50 mm.
 - Always wrap the fabric in the same direction.
 - Then use the **aeration roller** to roll out the length of fabric and remove any air pockets (**do not use a spiked or bristled roller**).
 - **Caution:** Apply adjacent lengths in parallel layers ("zip principle"). Do not apply each length separately.



- Immediately upon completion of the lamination process, apply DEXPAND®-CF70 Compression wrap with slight tension and in a spiral motion with **at least 20 mm of overlap**. Apply the compression wrap following the **same direction** as the DEXPAND®-CF70 Carbon fabric.
- **Caution:** Do not allow the DEXPAND®-CF70 Carbon fabric to move out of place due to the wrapping tension of the DEXPAND®-CF70 Compression wrap.
- Apply DEXPAND®-CF70 Compression wrap in a **longitudinal direction**, overlapping the DEXPAND®-CF70 Carbon fabric by **at least 20 mm**.



- Soak any dry areas of DEXPAND®-CF70 Compression wrap with DEXPAND®-CF70 Wetout until no more air pockets are visible.
- Then use the **aeration roller** to roll out the surface and remove any air pockets (**do not use a spiked or bristled roller**).
- **Loosen** the end of the DEXPAND®-CF70 Compression wrap (approx. 20 mm) to make it easier to remove the DEXPAND®-CF70 compression wrap and avoid damage at a later stage.
- Cover the area with **stretch foil** at least up to the marking tape.



- After sufficient curing of the DEXPAND®-CF70 (Shore D ≥ 80) the stretch foil, the marking tapes and the DEXPAND®-CF70 Compression wrap can be pulled off easily.
- Immediately afterwards a **corrosion prevention system** can be applied.
- If the surface is not immediately being coated with corrosion prevention, the entire area (up to the factory coating) must be re-wrapped with **stretch foil**.



- Application of a corrosion prevention system that meets the requirements of the pipeline. Please note the application recommendation as well as the product information of the used corrosion prevention system.
- **Caution: No mechanical rework processes** may be completed in the area in which DEXPAND®-CF70 has been applied.

Product	Processing temperature °C (°F)			Max. temperature difference between the surface and the material °C (°F)	Relative humidity %	Pot life at +23°C (+73°F) in minutes*	Storage temperature °C (°F)
	Material	Surface	Environment				
DEXPAND®-CF70 Putty	+15 to +35 (+59 to +95)	min. +3 (+5,4) above dew point	+10 to +40 (+50 to +104)	< +25 (< +45)	< 80	approx. 50	+5 to +30 (+41 to +86)
DEXPAND®-CF70 Primer*						approx. 35	
DEXPAND®-CF70 Wetout*	Quantity of resin > 500g*					approx. 40	
DEXPAND®-CF70 Carbon fabric	+15 to +25 (+59 to +77)					N/A	
DEXPAND®-CF70 Compression wrap						N/A	
Surface preparation	The specific application instructions must be followed.						
Health, safety & environmental protection	The installation must comply with all locally applicable and standard environmental and safety regulations. All safety and environmental instructions on product labels and safety data sheets must be complied with. Wear personal protective equipment such as safety goggles, safety gloves and appropriate work clothing. Cover the ground to protect against contamination.						
*With two-component reactive systems, the pot life is influenced by the prevailing temperatures. For quantities greater than 500 g we recommend to temper the resin components to +20°C (+68°F) before application due to the exothermic reaction							