NIAKIMYA
Corrosion Protection Solution

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Required Equipment and Materials

Category	Item
Safety	Latex gloves, Heat-resistant gloves
Materials	Epoxy (Part A & B), Hardener, Closure Patch
Application	Application pad, Stirring stick, Roller
Tools	Propane Torch (Non-sooting flame), Thermometer

Step-by-Step Installation Protocol

1. Surface Preparation and Geometry Check

1. **Cleaning:** Inspect the field joint area. If any contaminants (oil, grease, etc.) are present, thoroughly clean the localized area using an appropriate solvent.
2. **Cutback Angle:** Confirm that the pipe coating's cutback forms a **35° to 45° bevel angle** with the pipe wall. If the angle is incorrect, adjust the geometry as required.
3. **Blasting and Cleanliness:**
    - Blast the bare steel surface to a cleanliness grade of **ISO 8501-1 SA 2 1/2**.
    - **Roughening (PE):** Prior to epoxy application, roughen the polyethylene (PE) coating surface **10 cm** on both sides of the weld using abrasive blasting followed by an electric wire brush, focusing on the back-cut area.
    - **Profile:** The final surface profile (roughness) for both the steel and PE must be between **50 and 100 microns**.
4. **Final Debris Removal:** Use clean, dry compressed air to forcefully remove all blasting residue, dust, and dirt, paying special attention to clearing any pores in the polyethylene.

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2. Preheating and Primer Mixing

5. **Preheating:** Position the upper, cooler blue part of the torch flame approximately half a meter from the pipe. Uniformly heat the steel surface and the polyethylene back-cut area to a temperature range of **55°C to a maximum of 65°C**.
    - **Flame Quality:** Ensure the torch flame is clean (non-sooting).
    - **Weather Protection:** Use suitable protection (e.g., ventilated tent, wind shield) during adverse weather conditions (rain, high winds).
6. **Primer Mixing:** Mix the pre-packaged two-part epoxy (A & B) for **one minute** in the factory containers provided for that specific joint.

    Note: The primer's pot life (set time) is dependent on ambient and pipe temperature.

7. **Temperature Verification:** Before proceeding, use the thermometer to confirm the metal and PE surface temperatures remain within the **55°C to 65°C** range. Re-preheat if the temperature has dropped.

    Caution: Avoid localized overheating, which can compromise the factory coating. Apply heat evenly.

3. Primer Application and Sleeve Placement

8. **Primer Application:** Immediately after preheating, use the application pad to apply the mixed primer to the metallic cutback area at a uniform thickness of **100 to 120 microns**. Extend the primer application **one centimeter** onto the existing

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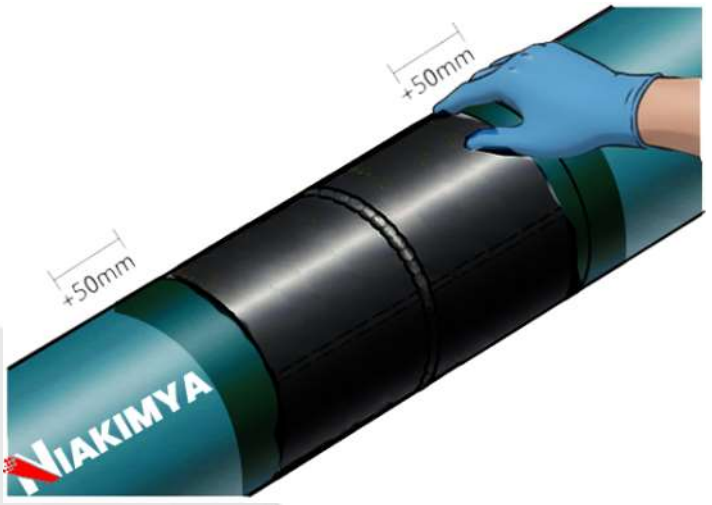
factory coating on both sides. Continue with the same pad to coat **15 cm** on both sides of the cutback onto the PE surface to a uniform thickness.

9. **Sleeve Preheat:** Prior to positioning the heat-shrinkable sleeve, gently apply mild heat to the applied epoxy primer.

   Note: The target temperature range, allowing for the exothermic curing and subsequent heat application, is an average of **85°C to 90°C**.

10. **Sleeve Preparation (Corners):** Cut the corners of the sleeve edge that will lie underneath (the first edge placed on the pipe) to a **50 mm x 50 mm** dimension.

    Critical Step (Wet-on-Wet): The sleeve must be applied while the primer is still **WET**. Post-heating (Step 9) and immediate sleeve application must follow primer application without delay.



11. **Sleeve Installation and Overlap:**
    - Place the prepared (corner-cut) edge of the sleeve onto the pipe first.
    - Heat the second edge and overlap it onto the first edge by **7 to 10 cm**.
    - The longitudinal overlap must be sealed at the **1 o'clock or 11 o'clock** position on the pipe circumference.
    - The correct sleeve length is specified in the project documentation/table relative to the pipe size.

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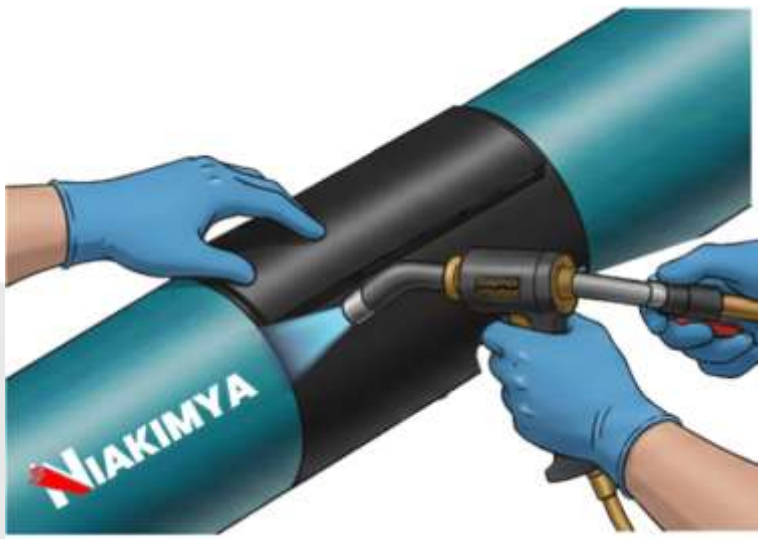
4. Closure Patch and Shrinkable

12. **Closure Patch Heating:** Heat the closure patch until the adhesive surface appears **glossy**.

    Note: The closure patch acts as a temporary sealing element, becoming non-functional once the main sleeve has fully shrunk and cooled.

13. **Closure Patch Application:**
    - Slightly warm the sleeve's overlap section.
    - Take the heated closure patch (pre-folded longitudinally down the center as per Step 11) and place it over the sleeve overlap.
    - Heat both the closure patch adhesive and the sleeve overlap simultaneously. Start by heating the side of the closure patch that is lifted higher, then heat the other side, and immediately press with the roller.



14. **Shrinking Procedure:**
    - **(Large Diameter Pipes):** For pipes over **30 inches** in diameter, a minimum of three personnel should be used for the coating application phase.
    - **(Torch Movement):** Start heating the HSS at the center, moving the torch in a **circular, spiral pattern** to the edges.
    - **(Visual Indicator):** Continue heating until all **thermo-chromic indicators** on the sleeve are flat, the strip surface is entirely **glossy**, and exhibits a **"gel-like"** appearance.

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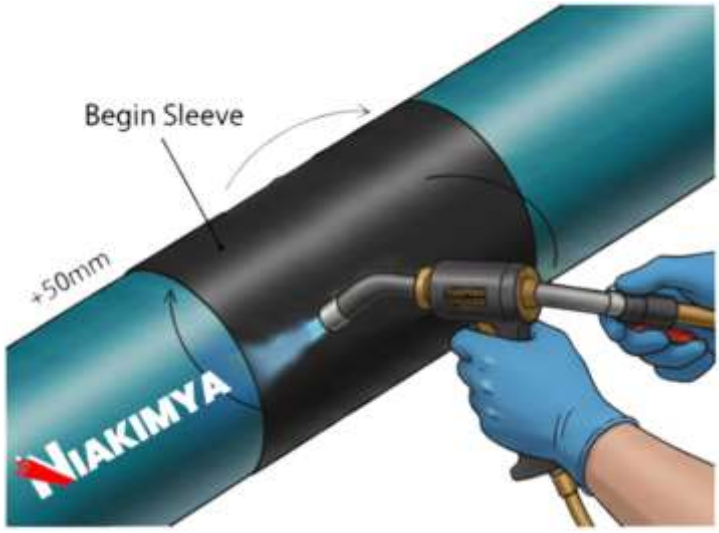
15. **Complete Shrinkage:** Apply heat around the **entire circumference** of the pipe until the sleeve has fully and completely shrunk.

    Note: After all heating is complete, fully seal both sides of the closure patch using mastic material.



16. **Rolling and Inspection:**
    - Use the roller to work out any trapped air and all wrinkles.
    - Before the sleeve cools, roll the entire surface of the field joint.
    - The final sleeve must be free of **"cold spots"** and must not retain any raised thermal indicators.

    Final Note (Burial): time interval between HSS application and the pipeline's burial must not exceed **ten days**.