



IRO™ (IMPACT RESISTANT OUTERWRAP)

APPLICATION SPECIFICATIONS FOR IRO

DESCRIPTION:

POLYGUARD IRO (Impact Resistant Outerwrap) consists of a strong fiberglass wrap that is pre-impregnated with a water activated resin that hardens in minutes.



PRODUCT PROPERTIES:

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Working Time:	30-40 min. at 25°C (77°F)	Mix Ratio:	No mixing required
Application Temps:	4-93°C (40-200°F)	Service Temps:	-40 - 121°C (-40 - 250°F)
Cure Time (dry to touch):	30-60 minutes at 25°C (77°F)	Full Cure:	2 days at 25°C (77°F)
Usual Packaging:	Pre-Packaged Rolls	Shelf Life:	1 year
Chemical Resistance:	Acetone, mek, toluene, gasoline, ethyl alcohol and many others	Hardness:	90 Shore D - ASTM D-2240

TEST	G-01 FABRIC
Tensile Strength (warp direction), psi	42,816
Tensile Strength (fill direction), psi	42,816
Tensile Modulus (warp direction), msi	2.5
Tensile Modulus (fill direction), msi	2.5
Tensile load per ply (warp direction), pounds per inch of width	514
Tensile load per ply (fill direction), pounds per inch of width	514
Thickness , mils	12
HDT , °F	325
CTE , in/in °F (est)	8.2 e ⁻⁶
Tg , °F	288
Bond strength to steel with BP-1 Adhesive , psi	1360

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This information is based on our best knowledge, but POLYGUARD cannot guarantee the results to be obtained.

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1. Scope

- 1.1. This Specification and Application Guide may be used for the application of the **POLYGUARD IRO™ (IMPACT RESISTANT OUTERWRAP)** System for Impact and Abrasion Resistance to protect the Corrosion Coating over field joints from damage during pipe installation in directionally drilled applications.
- 1.2. This Specification and Application Guide covers pipelines that operate at a maximum service temperature of 150°F (65°C) when using **RD-6®** as the field joint coating.
- 1.3. This application guide specifies a composite thickness of 4 layers. This should be increased to 8 layers in highly abrasion rocky soils or high impact zones.
- 1.4. The Applicator shall follow the general guidelines provided by this Specification and Application Guide to ensure that the implementation of the **POLYGUARD IRO™** is comprehensive and correct for the specified work.
- 1.5. The Applicator shall also follow any additional written procedures providing further details for unusual or more specific types of applications, to ensure that the implementation of the **POLYGUARD IRO** System is comprehensive and correct for the specified work.

2. General Requirements

- 2.1. The owner shall comply with all written recommendations of the Manufacturer regarding the application of the **POLYGUARD IRO**. Written reports shall be kept for each field joint.

3. Surface Preparation Requirements

- 3.1. Remove dirt, grease and oil from the FBE in accordance with SSPC-SP-1 "Solvent Cleaning".
- 3.2. When **POLYGUARD IRO** is to be applied by tying into existing main line coating. When these coatings are Fusion Bonded Epoxy (FBE), Three Layer or other coatings with a polyolefin outer layer, these coatings should be sanded with 80 grit emery cloth to abrade the surface of the main line coating a minimum of 6 inches beyond each end of the **RD-6®** before application of **POLYGUARD IRO** over the main line coating and **RD-6**. This abrading is only to give a roughened surface for the **POLYGUARD IRO** to adhere and should not further damage the main line coating or expose the steel surface. If the main line coating is **Polyguard RD-6** this abrading is not necessary.

4. Materials

- 4.1. **POLYGUARD IRO** is comprised of a woven fiberglass tape that is impregnated by an uncured (liquid) polyurethane resin.
- 4.2. The resin component of **POLYGUARD IRO** is activated by fresh or salt water and hardens as it cures, resulting in a thermoset composite.
- 4.3. The hardening of the resin component produces an impact and abrasion resistant fiberglass-reinforced composite sleeve, resistant to attack by petroleum products and many other chemicals, and possessing its greatest strength in the circumferential (hoop) direction of the pipe that is being coated.
- 4.4. The Physical Specification values shall meet the values given on the data sheet for **POLYGUARD IRO**.

5. Application over RD-6 for HDD field joint coating protection.

- 5.1. After **RD-6®** has been applied (without the **SP-6™ outer wrap**), open pouch and immerse **POLYGUARD IRO** roll in water for a minimum of 10 seconds. The resin component of **POLYGUARD IRO** is activated by fresh or salt water and hardens as it cures, resulting in a thermoset composite.
- 5.2. In Cold Weather applications, the temperature of the pipe surface in the repair area must be heated to a temperature over 40°F (5°C) prior to the application of **POLYGUARD IRO**. This pre-heated pipe temperature shall remain above 40°F (5°C) until proper cure is achieved. The **POLYGUARD IRO** resin component will not cure properly when the pipe temperature is below 40°F (5°C).
- 5.3. The **POLYGUARD IRO** application should start on the side of the field joint that will be pulled into the bored hole first. Start the application of **POLYGUARD IRO** at a minimum distance of 6" beyond the **RD-6** and spiral wrap using a 75% overlap to achieve a thickness of four layers. The **POLYGUARD IRO** should be applied in the same direction as the **RD-6** inner wrap was applied.

- 5.4. The **POLYGUARD IRO** application shall be tapered onto the existing pipe coating at both ends of the field joint area. This is achieved by wrapping 4 layers of **POLYGUARD IRO** in a spiral with a 75% overlap.
- 5.5. Hold the end of the **IRO** firmly to the surface of the pipe at the starting point between the 8 o'clock and 10 o'clock position on the pipe.
- 5.6. Unroll **POLYGUARD IRO**, keeping the roll as close to the surface of the pipe as possible. Do not use a long lead of **IRO**. The roll of **POLYGUARD IRO** should always be applied with the roll being applied from the side of the roll that is closest to the pipe to maintain proper tension and pressure.
- 5.7. At the beginning of the application of **POLYGUARD IRO™**, where the wrap will be tied into the mill applied pipe coating, apply the first two wraps tightly around the pipe. Then the **IRO** shall be spirally wrapped firmly around the length of the field joint with a 75% overlap and at least 6" on to the main line coating on the other side.
- 5.8. The completed wrap over the length of the field joint will have 4 layers of **POLYGUARD IRO**. (Note: for high impact and rocky soil applications 8 layers may be required).
- 5.9. The tape may be applied from right to left (R-T-L) or from left to right (L-T-R) depending on direction the joint will enter the hole. (Note: the installation may consist of more than one roll of **POLYGUARD IRO**. When adding rolls overlap tail end of roll with leading edge of new roll by at least 6" and continue spiral wrapping.)
- 5.10. The completed **POLYGUARD IRO** application is recommended to be over wrapped by two layers of compression film or stretch wrap. This film shall be perforated using a perforating tool, wire brush or pin to allow the CO² off-gas of the resin's curing process to escape. The compression film should be removed when **POLYGUARD IRO** has reached its initial cure time. When wrapping large diameters or long runs, follow the **POLYGUARD IRO** installation closely with the compression film to compress the resins before the short set time. WORKING TIME IS APPROXIMATELY 5 MINUTES. Compression film should be applied before product has reached the 5 minute set time.
- 5.11. The **POLYGUARD IRO** should be allowed to cure for a minimum of 30 minutes at 70°F (21°C) or to a hardness of Shore D 70, before pulling field joint through bore. Pipe diameters over 12" will require an additional length of coverage on to the existing main line coating. A general rule is to cover a length back from the **RD-6** equal to the diameter of the pipe. If working on 18" diameter pipe the coating would begin 18" from the edge of the **RD-6**.

PRECAUTIONS:

This material is sold by **Polyguard Products, Inc.** only for the purposes described in this literature. Any other use of the products is the responsibility of the purchaser and **Polyguard Products** does not warrant nor will be responsible for any misuse of these products. **Polyguard Products** will replace material not meeting our published specifications within one year from date of sale.

HEALTH AND SAFETY:

All **Polyguard Products** Safety Data Sheets (SDS) and precautionary labels should be read and understood by all user supervisory personnel and employees before using. Purchaser is responsible for complying with all applicable federal, state or local laws and regulations covering use, health, safety, and disposal of the product.

MAINTENANCE:

None required.

Technical Service:

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