TRU STEEL METALS LLC

Tru Tuf 600 Induction Hardened Pipe
Field Fabrication and Welding Guide

Introduction

Field fabrication and welding of TruTuf 600 Induction Hardened pipe can be done with an understanding of the properties and precautions. TruTuf 600 Induction Hardened Pipe and Fittings are engineered to resist the destructive effects of sliding solids transported by slurry or pneumatic pipelines. The resistance to abrasion is the result of an induction hardening process, that gives the pipe a hardened inner surface. This hardness of inner surface will begin to decrease as the temperature approaches 500° F (260°C). The following procedures will assist in maintaining the abrasion-resistant qualities

Scope

This guide covers the field welding and cutting of TruTuf 600 Induction Hardened products, with and without water cooling. It is intended solely as a guide.

⚠ WARNING ⚠

The Induction hardening process imparts internal stresses in the pipe wall. Pipe must never be cut lengthwise. To prevent serious personal injury or property damage, all cutting and welding must be done with caution.

Cutting

Cutting of TruTuf 600 Induction Hardened products can be accomplished with the following:

- Plasma cutting equipment
- Abrasive cut-off wheel (water-cooled)
- Oxy-fuel cutting equipment (not recommended)

When using plasma or abrasive cut-off equipment, the heat imparted to the material should be minimal and no special precautions are required. Avoid excessive temperature when using abrasive wheels.

When using oxy-fuel equipment, the cut must be made in increments of 5 or 6 inches (127 or 152mm) and the pipe allowed to cool between cuts. Where possible, preheat the material for the initial cut, away from the cut line. Once the material is pierced, traverse the torch to the cut line and proceed. This will minimize heat input to the portion to be retained for use. Much less energy is required to restart the cutting process once the pipe wall is pierced. Oxy-fuel cutting is not recommended and should only be used if plasma cutting equipment or an abrasive cut-off wheel are not available.

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Welding

Joint Preparation

- Remove all slag and discolored material after cutting.
- Inspect surfaces to be welded -avoid welding areas that have tears, cracks and other discontinuities.
- Clean joint area at least 1/2" (12.7mm) from welding joint; remove all loose scale, rust, moisture, grease, etc.

Fit Up

- Bring parts into as close contact as practical; root opening should not exceed 3/16" (4.76mm).
- For separations greater than 1/16" (1.58mm) , increase leg of fillet weld by the amount of the opening.

Preheat and Interpass Temperatures

- If ambient temperature of parts is below 70° F (21°C), preheat weld zone and 6" (152.4 mm) of adjacent material to 100 ° F (38°C).
- Do not exceed 450 ° F (232°C) interpass temperature.

Electrodes or Wire

- E7018 electrode (or equivalent), 1/8" (3.18mm) or smaller or other suitable low hydrogen electrode or filler metal should be used.

Welding With Water Cooling (Preferred Method)

- Place welds on exterior of pipe.
- Aim a gentle stream of water at the weld arc area inside the pipe; overflow from stream
- Should bathe previously welded areas.
- 4 to 6 GPM (15 TO 22.7 L/min) water flow rate.
- No water in contact with exterior of pipe.
- ¼" (6.3mm) maximum fillet weld size (per pass) when using water cooling (stringer bead only).
- Rotate the pipe during the welding process to eliminate excessive starting and stopping of weld.

Welding Without Water Cooling (Alternate Method, Use Only When No Water Is Available)

- Place welds on exterior of pipe.
- Keep weld beads as small as possible; length should not exceed 5 to 6 inches (127mm to 152.4mm).
- Allow pipe to cool before applying additional beads.
- Use stringer beads; avoid weaving beads.
- Weld using multiple passes - five to six passes for 3/8" (9.5mm) fillet welds, ten to twelve passes for 1/2" (12.7mm) fillet welds.

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