

Postle Industries, Inc.

Cleveland, OH USA

Phone: 216-265-9000

Fax: 216-265-9030

E-Mail: sparky@postle.com

Web Site: www.hardbandingsolutions.com



WATER COOLING PROCEDURE for HARDBANDING

Overview

The purpose for this procedure is twofold.

1. Protect the internal plastic coating (IPC) in drill pipe from burning or scorching during the hardbanding process. The IPC is easily damaged by the high temperature generated when hardbanding is applied.
2. Protect the IPC while hardbanding yet doing so in a manner that does not raise the hardness in the heat affected zone (HAZ) to unacceptable levels. For more information concerning the HAZ, please review the Postle Duraband Procedure Manual.



Protecting the IPC is easy. Filling the pipe with water will keep the temperature at a low enough level so as not to burn the IPC. The problem is that this would cool down the temperature in the tool joint, causing too high a hardness in the HAZ(heat affected zone)

Applying hardbanding and ensuring that the hardness in the HAZ is kept at a low level is also easy. Proper preheating, interpass, and cool down procedures are in place to ensure this. However, the hardbanding process generates high enough temperatures that will burn or scorch the IPC.

The following procedure is designed to ensure HAZ hardness levels that are acceptable and still protect the IPC from being damaged.

Equipment Required (not supplied through Postle Ind.)

1. Water tank capable of holding at least 15 gallons (55 liters) of water
2. A method for heating and maintaining the heat at a temperature of 195°F (90°C)
3. A water pump capable of pumping approximately 15 gallons (55 liters) per minute and withstanding a temperature of 195°F (90°C).
4. A thermometer to check the water temperature.
5. A method for raising and lowering the end of the drill pipe approximately 4" to 6".
6. A steel thread protector to keep water from leaking out of the end of the drill pipe during the hardbanding process.

Plus all of the normal equipment and tools needed in the hardbanding operation.

Procedure

1. Close off the end of the pipe to be hardbanded. A thread protector will work, however it should be steel and not plastic because of the high temperatures during hardbanding.

2. Prepare the pipe for hardbanding as per standard procedures. Be sure that all rust, coatings, etc have been removed prior to hardbanding.

3. Preheat the water to 195°F (90°C). The water and tank need to be situated at the opposite end of the pipe. The water needs to be heated to its working temperature before preheating the tool joint.

Having the water at the right temperature at the right time is critical. It is important that there isn't a delay once the operation is started. If the hardbanding begins before the water has reached its proper temperature the IPC could be burned. If the water is injected into the pipe before it has reached its max temperature, the HAZ could be affected.

4. Preheat the tool joint to the proper preheat temperature.

5. Chuck the tool joint into the hardbanding machine ensuring that all of the setup is correct to complete a quality hardbanding job.

6. Raise the extreme end of the drill pipe 4" to 6" so that when the water is pumped into the drill pipe it will not drain back out.

7. Begin hardbanding.

8. Approximately 1 minute after starting to weld, pump 5 to 6 gallons (20 to 25 liters) of 195°F (90°C) water into the end of the drill pipe.

9. Complete the hardbanding process, leaving the water in the drill pipe until the hardbanding process has been completed.

10. Wait for 1 minute after the welding has been completed (leave the pipe rotating) then lower the end of the pipe and quickly drain all of the water back into on the tank.

11. The pipe can then be removed from the machine and allowed to slow cool as per normal procedures.

NOTE:

To ensure that this process is done effectively it is important that all of the equipment, water temperature, and personnel are ready so there are no delays. The timing is important to ensure that the pipe is not cooled down too much with the water. Pumping in water at the correct temperature at the right time is critical.

Any delays in setting up the hardbanding machine should be avoided so the proper preheat temperature is maintained. Any delays in pumping the water in at the right time could let the IPC become burned before the water is in there to protect it.

If the hardbanding process has to be interrupted for on any reason, such as running out of wire, or gas, etc. the water should be immediately drained out and the process restarted once the reason for the delay has been resolved. Leaving the water in the pipe while resolving such a problem will cool down the HAZ too quickly and can damage the pipe.