



The photos above are two examples of hardbands exhibiting unacceptable cracking. Hardbanding in this condition should never have new hardbanding re-applied over them. It must be ground out and rebuilt before new hardbanding can be applied.

This is an expensive and time-consuming process that can be avoided.

Postle's technical team is always available to help analyze hardbanding challenges such as cracking and spalling.

## Why do some hardbands crack?

Good, effective hardbands are free of cracks, spalling, porosity, and voids. They also must meet dimensional criteria that makes their use more effective and allows them to wear well and protect the casing. Years ago, before the introduction of Duraband®NC, cracking hardbands were common and accepted. Even today there are still several hardbanding wires that crack. Below are some conditions when cracking can appear.

### The wire

Some wires are designed to crack. It is a stress-relieving process and can be desirable in some *non-oilfield hardfacing* applications. Hardbanding on drill pipe is one of those applications where cracking should not be tolerated, especially on re-application. The chemical composition of the wire can dictate whether it will crack. Wires containing Boron, for example, are unpredictable and will have a much greater tendency to crack. On drill pipe, cracking can be an expensive process because these welds, sooner or later, will have to be removed by grinding them out and rebuilding the area removed. Cracking in the hardbands can also lead to accelerated casing wear.

### The material being welded over

Hardbanding is sensitive to what it is being applied over. During the welding process the alloy of the hardbanding wire is mixed with the material at the surface as it is being welded. If this surface is unstable for any reason, the new hardbands will likely show signs of it. Cracked, spalled, brittle, or contaminated hardbands are very difficult surfaces on which to reapply hardbanding. Additionally, previous hardbands containing Boron or Tungsten Carbide will often crack when new hardbanding is applied over them. Frequently the old weld must be ground out and then rebuilt before new hardbanding can be applied. A knowledgeable hardbander can occasionally go over some of these surfaces, but sooner or later, old or damaged bands will need to be removed.

### Welding parameters

All welding products have published parameters for proper and effective application. These parameters include torch and welding machine settings, shielding gas mixture and volume, along with pre-heating and post-cooling practices. Each wire has its own set of parameters and varying from the manufacturer's recommended parameters and procedures can produce unwanted results. Cracking is one possible outcome created by non-conformity to these parameters. Improper pre-heating is one of the most common procedure shortcuts which can result in compromised hardbands. Insufficient post cooling procedures is another procedural flaw that can produce unwanted results. Cracking is frequently the result of poor pre-heat and post cooling procedures.

The best way to avoid cracking is by using a stable and non-cracking hardbanding wire such as Duraband, welding over an existing non-cracking and compatible surface, and paying close attention to the proper welding parameters.

**Duraband®NC and Tuffband®NC are non-cracking wires. They make reapplication easier, quicker, and less expensive.**



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