



August 28, 2007

To: All Sales Consultants

From: Ken Kaluzny

Re: **Laser Scale Removal – Descale 62**

Many of you know that I like to recommend Descale 62 for laser oxide removal. We generally discuss the attributes of Descale 62. We just ran a TSR that exhibits some of Descale 62's attributes. I thought that the test data would be useful for future sales opportunities. Descale 62 is the result of our dedication to continuous improvement. The formulation puts together the best of what we know about scale removal. The formulation combines the strength of inorganic acids with the finesse of organic acids. Special additives increase the rate of oxide penetration and decrease the rate of iron loading and sludging. The Descale 62 formulation allows for laser scale/oxide removal edges without over pickling the greater surface area of the face of the work piece. Descale 62 also contains detergents for removing organic soils.

Your instinct is correct if you surmised that the use of an inhibitor is very important. The choice of inhibitor is also important as its function is based on the acids within the formula. Inhibitors provide a couple benefits. First and foremost they prevent attack of the raw metal. They don't prevent attack forever, but considering the dwell time in a spray or immersion pre-paint treatment process; they prevent attack. The implication is that you will use less acid thus reducing chemical costs because you won't be dissolving as much iron. Think about how much surface area of a part needs to be pickled to remove laser oxide. The savings are great. Bath life is increased because there is less iron loading which further produces savings in that there is less to haul away or treat. All of this means that there are less tank charges. A second and equally important benefit, if the inhibitor is chosen correctly, is that the freshly pickled part will resist flash rusting. Not forever but long enough to get it to the treatment stage. The creation of flash rust will be detrimental to the overall corrosion protection of the finished part due to the erratic surface conversion. The constrained pickling of the face of the steel will also help to remove inorganic soil that can interfere with the ability to meet corrosion resistance specifications.

The lab work simply compared sulfuric acid at 2.5 and 5.0 % v/v with Descale 62 at 5.0% v/v. CRS panels were immersed in these solutions for various lengths of time without agitation to control exposure and dissolution rates. The following table provides sludge data for comparison.

| Chemical | Concentration | Sludge at 72 Hours | Sludge at 144 Hours |
|---------------|---------------|--------------------|---------------------|
| Sulfuric Acid | 2.5% v/v | 219 mg/L | 612 mg/L |
| Sulfuric Acid | 5.0% v/v | 455 mg/L | 884 mg/L |
| Descale 62 | 5.0% v/v | 15 mg/L | 29 mg/L |

As you can see the sludging seen from pickling with Descale 62 is far less than with sulfuric acid. The reason sulfuric acid was used is that it is a major component of most competitive laser oxide scale removers.

The picture below provides you with a visual comparison as far as Descale 62's ability to resist flash rusting. The panels were immersed in the acidic solutions previously mentioned for 60 to 90 minutes. The panels were removed from the solutions and allowed to air dry before rinsing in an attempt to duplicate what ware might experience between stages. After water rinsing the panels were allowed to air dry. The panel on the right was treated with Descale 62. Note the difference in flash rusting potential.



I firmly believe Descale 62 is our best laser scale remover to date. It is easier on stainless steel equipment than Descale LO yet not too far behind in performance and operating conditions. Descale 62 is used at much lower concentrations than Descale AA or AC. Descale AA is destined for obsolescence as it is not waste water treatment friendly. Descale 62 will not interfere with waste water treatment operations for iron or zinc phosphate pretreatment systems.

The following is a list of our current laser oxide scale removers:

| Product | OB # | Comments |
|------------|--------|---|
| Descale AC | 102-40 | Mildest product with detergency; easy on equipment |
| Descale AA | 102-41 | Will be obsolete |
| Descale 59 | 102-44 | Concentrated phosphoric acid w/ accelerators, no detergency |
| Descale 62 | 102-45 | Combines effectiveness of 250-31 with safety of 102-40 |
| Descale LO | 250-31 | Sulfuric acid base with high detergency; hard on equipment |

If you have any questions or comments, always feel free to give me a call.

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