

Micro-Abrasive Blasting Solutions for Medical Implant Devices

Medical implant devices fabricated by laser machining and stamping of nickel titanium alloys (nitinol) often contain minute defects and blemishes as a result of the manufacturing process. If left untreated these imperfections will adversely affect the performance as well as the life span of the device. Many of the leading manufacturers of stents, shunts, cages and other medical implant devices have turned to micro-abrasive blasting as an effective means of eliminating these possible sources of problems.

Medical implant devices are commonly blasted to:

- Remove discoloration and oxide layers from implant surfaces.
- Smooth laser pulse marks and sharp edges.
- Remove or cut laser slag (remelt).
- Decrease the propensity of micro-cracking.

Remove discoloration and oxide layers

The environment where medical implant devices are placed makes them highly susceptible to corrosion. To reduce the vulnerability of the devices to corrosive elements, it is important for their surface areas to have a smooth finish. Oxide layers and discoloration generated in the laser machining process impair the ability of electro-polishing to create the desired finish. Blasting the devices with micro-abrasives removes the oxide layers and discoloration, ensuring the effectiveness of the electro-polishing process.

Smooth laser pulse marks and sharp edges

Laser machining leaves pulse marks or striations on the walls of the devices. Corrosion occurs more readily to the uneven surface left by the pulse marks than to a smooth surface. Micro-abrasive blasting on the walls of the devices will smooth out the pulse marks and help prevent corrosion to the device.

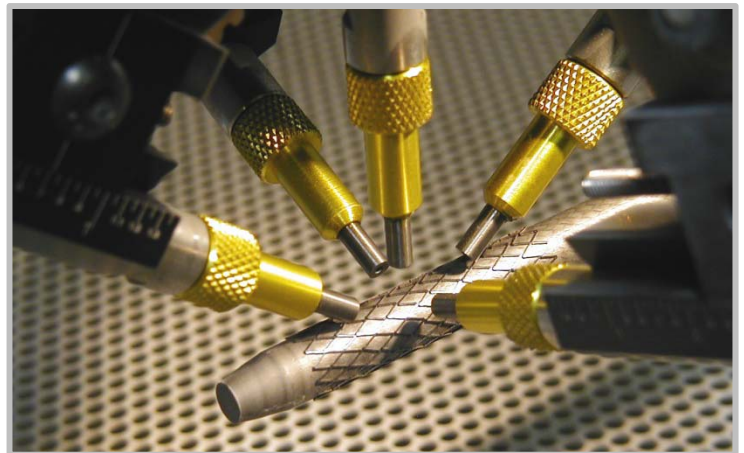
Medical implant devices must be free of sharp edges. Whether a device is manufactured by laser machining or by stamping, sharp edges will develop. A small radius can be imparted to the edges by blasting one or both ends to reduce the sharpness. The strut running



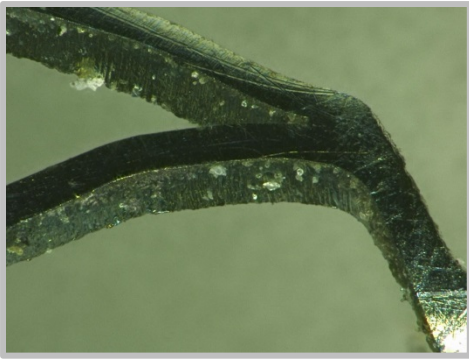
along the axis of a stent can be rounded with micro-abrasive blasting to eliminate the sharpness of the strut's edge.

Remove laser slag

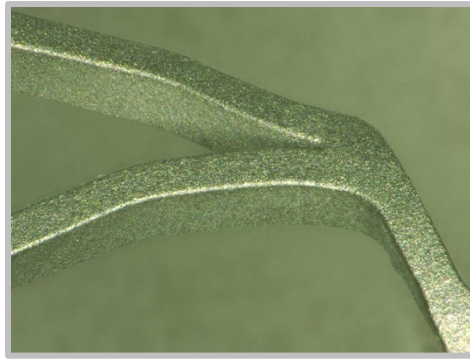
Microblasting is used to eliminate the "remelt" from strut junctions. This occurs where the residual laser slag re-bonds itself to the device, compromising its reliability. Blasting to remove the "remelt" restores uniformity to the material surface and removes the potential for small pieces of laser slag to break off with age.



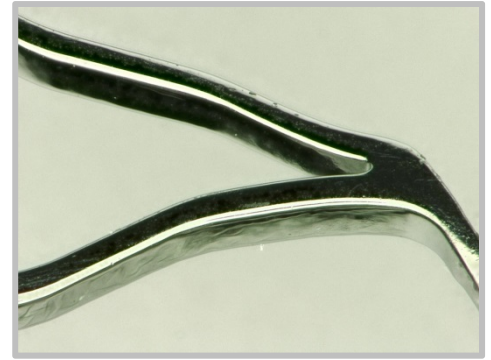
Processing Medical Implant Devices



Untreated Stent



Stent after Microblasting



Stent after Electropolishing

Decrease corrosion caused by micro-cracking

Both stamping and laser machining leave small cavities or micro-cracks on the base material. The cracks will corrode with time, becoming larger, and eventually weaken the structural integrity of the implant device. Micro-abrasive blasting effectively removes the cracks reducing the risk of the failure of the device.

In all of these applications micro-abrasive blasting is accomplished with a high degree of accuracy, precision, and repeatability. An AccuFlo nozzle can direct the abrasive on the outside of the device, or using specially engineered nozzles can blast from the inside out. This gives micro-abrasive blasting superior flexibility over other techniques.

Equipment

Comco's line of microabrasive blasters covers basic manual systems to fully automated production systems. All of Comco's blasters use a patented modulator system accurately meters the abrasive into the air stream, ensuring a consistency unequalled by any other blasting equipment.

Round nozzles in various sizes are used for blasting the OD of most devices. Special nozzles have been designed with extended length and 1 or 2 right angle machined openings for blasting the ID of a device.

Comco offers a range of abrasive types and sizes. For the majority of medical implant device applications either 17.5 or 25 micron aluminum oxide is the abrasive of choice. In certain circumstances where specific electro-polishing issues must be addressed, 20 micron silicon carbide is used.

Comco's Applications Lab

Many factors contribute to the best micro-abrasive blasting process: type and size of abrasive, size and shape of nozzle, pressure, time and position. Comco's Applications Engineers have the expertise and complete test facilities to determine if the most efficient process to improve your production efficiency and product quality.



Contact us today at 800-796-6626

And discover the MicroBlasting solution to your production problems!

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