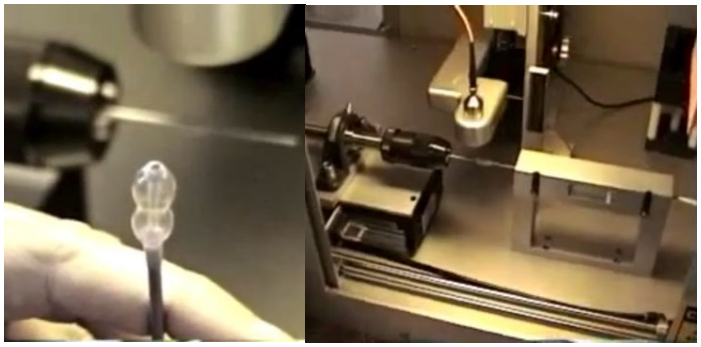
SIMCO ION™
An ITW Company

CASE STUDY 4

Yield Improvement

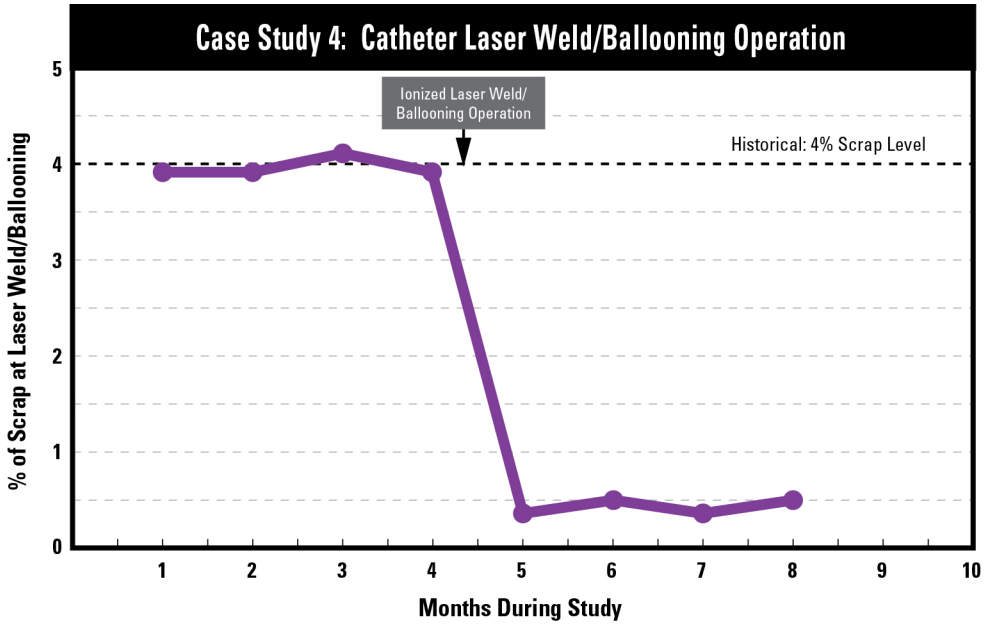
Laser Weld/Ballooning Operations on Catheters

Both the **laser welding** and **ballooning** processing steps in the manufacturing of modern catheter devices have been identified as troublesome operations that often result in a substantial percentage of rejects due to particle contamination issues.



ESA (electrostatic attraction) issues are at the core of yield loss problems with these machine operations. In general, a charged material attracts many more particles to its surface than its uncharged counterpart. Thus, if a section of a catheter becomes highly charged, it draws particles to it from the surrounding air and nearby surfaces. Even if a catheter is uncharged initially before the operation, the laser welding and ballooning cause those sections to charge dramatically during the process, usually into the 10-15Kv range.

This causes massive particle attraction to occur during the operation. Particles rush to the catheter ballooned/laser welded section from all over the inside of the machine equipment, sometimes from as far away as 1-2 feet. As the plastic being ballooned or laser welded at the time is in molten form, once the particle lands on the surface, **it becomes part of the surface permanently**, and these "embedded" particles cannot be cleaned off after the catheter cools. The unit has to be scrapped then if the embedded particle is bigger than the maximum allowable size defined in the specifications of the product. Non air assist, small "spot" ionizers were determined by Simco-Ion to be the appropriate ionization device and were located in this equipment to eliminate the charging issues completely. Below is a summary of an 8-month case study for a major **catheter** manufacturer – specifically surrounding yield losses at their laser weld and ballooning operations. Their scrap at this operation (particle contamination rejects) historically was around 4%. As seen in the study below, after ionization was added to the operation, the scrap levels fell to 0.7%.



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