CASE STUDY: FLEX LP 1503VR

Finishing 304 Stainless Steel

Using a handheld tool to finish installed parts

The standard commercial finish for 304 stainless steel looks dull and flat when viewed alongside polished stainless steel. A pharmaceutical manufacturing facility noticed this after ordering 65 stainless steel electrical enclosures.

Initially, the company had accepted the normal "unfinished" look of the 304 enclosures, but when they were viewed alongside polished stainless vessels, piping and equipment, this commercial finish contrasted sharply. Though functional, the 304 stainless was aesthetically incompatible.

In addition, it was discovered that all welds on the enclosures needed to be ground flat so they would not retain bacteria when the facility was routinely steam cleaned.

After consulting with the fabricator making the electrical enclosures, a 180-grain (brushed) finish was agreed upon for the welded boxes already delivered and those yet to be manufactured, an all welds were to be ground flat.

- **THE INITIAL ATTEMPT**

To achieve the desired effect, an initial attempt was made using an orbital (disk-type) polisher to grind down the weld seams, and hand finishing was used on the boxes' surfaces to the grained effect.

The disk-type polisher was the logical first choice for the fabricator because it was on hand and is used in the shop for grinding down welds and other applications in which the surface finish is immaterial. Also, a handheld tool was desirable for use on the boxes already installed.

Two problems became immediately apparent in this procedure; the circular patterns left by the disk sander could not be completely removed by the hand polishing; and the hand finishing being performed at the fabricator's shop and company's facility was labor-intensive, time consuming and costly.

One method for achieving the specified finish on the metal would be to use a floor-mounted, belt-type sander/polisher. The type of belt used determines the finish. These machines are widely used for polishing sheets of metal and any object which has flat surfaces. The drawbacks for these machines in this instance are that the metal must be physically passed over the belt, and the metal must be configured so that all the surfaces to be polished will contact the belt.

In this case, the exposed sides of the box, or cabinets, had different planes or shapes, so it would be very difficult to polish any side with a floor-mounted polisher. Also, as a practical matter, the boxes were generally more than 100 pounds each, so it would have been difficult for any shop worker to position and hold them against the belt. The fabricator would have relatively few opportunities to use a floor machine in other projects, so it was difficult to justify the cost of a floor-mounted grinder. Obviously, a floor mounted machine could not be used on the boxes already installed.

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- **THE FINISHER**

Finally, the fabricator chose an electric, handheld surface finisher that uses cylindrical enclosures. The tool was chosen for its ability to apply even pressure to the workpiece, and it could be used on the enclosures already installed.

One of the major drawbacks of the disk grinder was that it did not press evenly across its contact area, creating marks in the metal. Removable nylon roller guides on the front and back of the finishing tool helped the operator maintain an even pressure as it moved across the workpiece to provide a uniform finish.

The handheld tool could also be used on the installed enclosures. The offset of the cylindrical wheel permitted the operator to grain or finish surfaces up to the abutting walls. The tool used an 80/100 grit sanding/polishing flap wheel to produce a finish corresponding to the grain standard 80. The finishing tool was also used by the fabricator to flatten the weld seams.

- **CONCLUSION**

It is unlikely that the cylindrical grinder/polisher will put disk grinder/polishers on the shelf of or take the place of floor-mounted grinder/polishers. In this instance, the handheld cylindrical grinder provided the type of finish needed and the portability for off-site use.

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