A Process Description of swaging

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A Process Description of swaging

Swaging is the process of increasing or reducing the diameter of the end of a tube. This process is done by using a swaging tool that is used to make a permanent braised connection. Swaging eliminates the need for fittings and thus eliminates the opportunities for leaks. It also allows to increase the diameter of a tubing so the tube can be slipped inside another before brazing. A wide variety of swaging tools with different styles and sizes are available, however, the whole swaging process remains similar. Swaging can be broken down into two categories: punch swaging and rotary swaging. Usually a swaged piece is created by placing the tube inside a die that applies compressive force by hammering radially.

Figure 1: Swaging tools.
Source: https://cdn.mscdirect.com/global/images/ProductImages/9277361-21.jpg

1. punch swaging

This is the traditional way of swaging; the punch swaging tool is designed to punch the end of the tubing.

First, the lead end of the punch is inserted into the tubing. In this step, it is important that the tool is aligned perfectly straight with the tubing.

Second, the tube is gripped tightly.

Finally, a hammer is used to strike the punch driving the swagger into the tube until the stop is reached and the desired tube diameter is achieved.

2. Rotary swaging:

The rotary swaging is the opposite of the punch swaging. It is used to reduce the diameter of a tube rather than expanding it.

First, a die is mounted over into the swaging machine's spindle which is rotated by a motor.

Second, the spindle is mounted inside a cage containing rollers

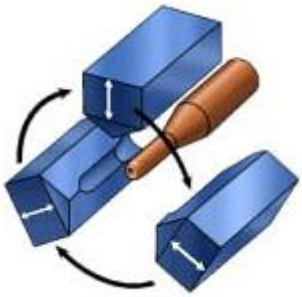

Figure 2: Rotary swaging.
Source:http://msvs-dei.vlabs.ac.in/images/Swaging/RotarySwaging.png

Third, since the rollers are larger than the cage, they push the dies together.

And thus, the diameter of the tubing gets smaller.

In conclusion, punch swaging, used to enlarge a tubing diameter, is done by a basic swaging tools and a simple hammer. Rotary swaging, however, used to reduce the diameter of a tubing requires more advanced and complex swaging machines that have at least three rotating dies. Swaging has lots of applications, mainly in electronics, pipes and cables, firearms and ammunition, and much more.

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