



Mike Riley

FLAT METAL DOESN'T ALWAYS MEAN STRESS RELIEVED METAL

GUEST COLUMNIST NICHOLAS MILLER OF ARKU COIL SYSTEMS EXPLAINS WHY PARTS LEVELING CAN'T FREE A SHOP FROM THE STRESS CAUSED BY A MISSED SHIPPING DATE, BUT IT CAN CERTAINLY RELIEVE THOSE PRODUCTION FRUSTRATIONS CAUSED BY METAL COMPONENTS LOADED WITH INTERNAL STRESSES THAT ARE RELEASED DURING WELDING, LASER CUTTING, PUNCHING OR BENDING.

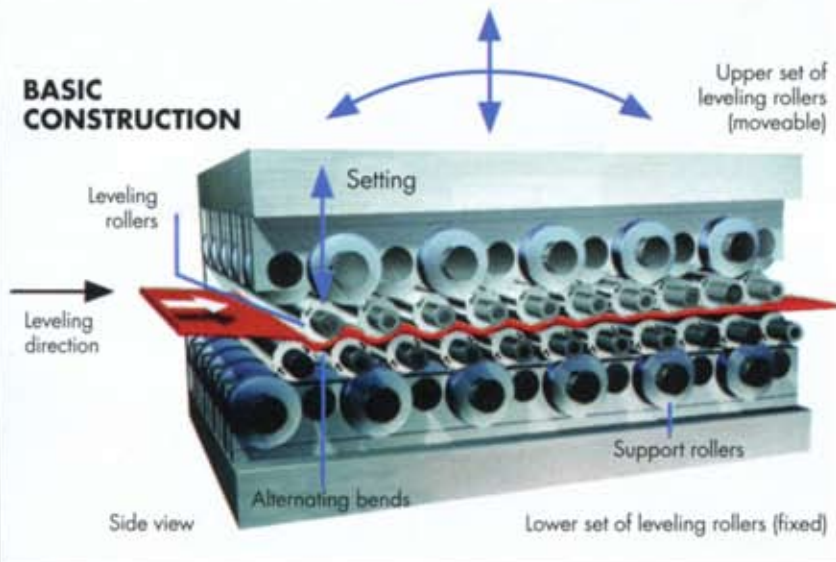
The material coming from a service center has probably been leveled at some point, but most metals retain internal stresses and a degree of coil defects that make setup, processing or assembly difficult downstream. Even material that appears perfectly flat may have internal stresses that are released during stamping, cutting or bending. The reason is that most upstream leveling processes don't sufficiently work the material past its yield point, which is key to realigning the stresses in a single direction.

EXCEEDING YIELD POINT KEY TO STRESS RELIEF

The servo-hydraulic parts leveler is uniquely designed for this purpose. This type of leveler uses a series of closely-spaced, small-diameter rollers – supported by large rollers to



BASIC CONSTRUCTION

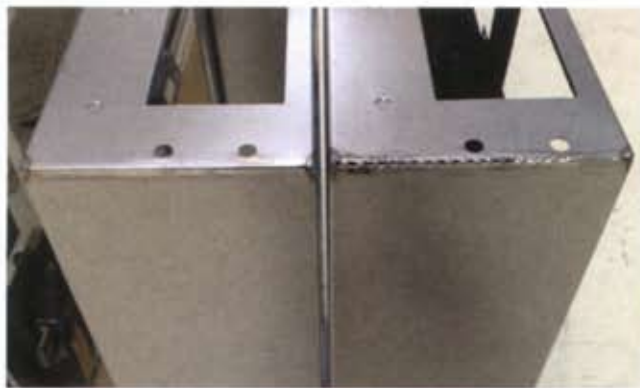


Whether it's coming from a service center or an upstream process, most sheet or plate will contain residual stress, as shown in left sample, compared to same material (on right) after processing in a parts leveler.

prevent deflection – to bend material sharply through a wave-like path to stretch the metal past its yield point.

After the initial sharp bend, the material is gradually returned to a flat state as it passes through the leveling rollers and exits the machine. Small-diameter rollers with a small roller pitch produce a sharper bend, ensuring the material is stretched past its yield point. The effect on material is quite different from a gantry hammer press, press brake, roll former, flame and hammer or any other leveling method. The hydraulic leveler is also fast, often giving the desired result on the first pass while others require multiple hits and checks.

The servo-hydraulic leveler adjusts its force instantly to compensate for the varying cross section of parts with large cutouts and perforations, or shapes such as triangles and circles.



Comparison of leveled and unleveled sheet metal after robotic welding.

And it doesn't take an expert to achieve great results on the first pass. It can take years for an operator to become an expert with a hammer press, and if that person leaves your company, it's a real handicap. Even in the hands of an expert, a hammer press can't stress-relieve parts, though they might appear flat.

PARTS LEVELING ISN'T STRIP LEVELING

Most important, the servo-hydraulic leveler is versatile because it's "smart." Servo-hydraulics adjust the leveling force instantly to compensate for the varying cross section of parts with large cutouts and perforations, or shapes such as triangles and circles.

The mechanical leveler on a coil line is not designed to do this. The



A free-standing servo-hydraulic leveler integrates easily into fab shop workflow to supply stress-free parts for bending, assembly or welding.



Nicholas Miller,
Technical Director,
ARKU Coil
Systems, Inc.

hydraulic leveler is also ideal for appearance critical parts required for medical, packaging machinery, food, beverage and scientific applications. There's no marring, slag, or discoloration from heat.

Fast leveling capability on the factory floor is a proven way to increase productivity and reduce rework. Welding robots find seams reliably with leveled parts. Setups are faster. Welding, cutting and bending results are more predictable. As a bonus, you can salvage material that does not meet flatness specs as it comes from the service center. ■

Nicholas Miller is the technical director at ARKU Coil Systems, Inc., 11405 Grooms Road, Cincinnati, OH 45242, www.arku.com.

DoALL

SAWING PRODUCTS
888-362-5572

FABTECH
2014 SHOWCASE

500DS



The affordable DoALL 500DS swivels 45° right and 60° left and features a 14x20" capacity of rectangles and 15" rounds at 0°.

FABTECH
AND WELDING COIL FMA SMC PMA METALFORM

B4611

TF-1418



The TF-1418 can tilt 60° left and 45° right and has a capacity of 14" x 18" at 90°, and cuts structural steels, tube and channels, for all structural needs.

See these saws and more at Booth B4611 at FabTech 2014!

Solutions For All Your Sawing Needs / Made in the USA / www.doallsawing.com