AGA UPDATE

Question of the Month

Q: How can I tell if a piece of steel has been galvanized?

A: This question was actually received by one of the AGA staff and is a bit out of the ordinary. The question came from an OEM of trailers wanting to promote their trailers as using hot-dip galvanized steel in the construction. As it goes, the trailer manufacturer purchases some of the trailer parts from another company. The other company would not tell the trailer OEM if the parts were galvanized or not. (Call me suspicious at this point.) The caller indicated she was frustrated with not knowing and thought she could place a magnet on the manufactured part to determine if it was galvanized.

Strictly speaking, zinc is non-magnetic and of course we use this principle when we measure coating thickness. The tip of the pencil, banana, and electronic measuring device is magnetic and it is attracted to the substrate steel, which of course contains iron which is magnetic. Each gauge is calibrated to measure the space between the magnetic point of the gauge and the steel.

However, the fact zinc is non-magnetic doesn't really help the caller out. Zinc can be applied in the form of dust (zinc-rich paint), hot-spray (metalizing), or powder (mechanical peening). Using a magnet or gauge will only determine if there is a zinc coating on top of the steel. And as a matter of fact, the gray coating she sees may be just paint. A film of paint would have a thickness to it.

The only real way to determine if the coating is hot-dip galvanized would be to run laboratory testing. One test would be EPR, or electron paramagnetic resonance. EPR shows the molecular content of material on an oscilloscope and galvanizing would show up as having high zinc content on the outer surface and zinc & iron content on the inner layers. Mechanical peening & metalizing would show no iron in the coating and zinc-rich paint would contain some binding material. Another method would be to take a cross-section of the coated steel and take a photo-micrograph. Galvanizing would show the three intermetallic layers, metalizing and mechanical peening would indicate only pure zinc, and the zinc-rich paint would highlight the bonding material.

Because the three methods of zinc application are inferior to hot-dip galvanizing in terms of durability, hardness, consistency in coating thickness, etc., and the position of the parts company not to disclose the coating type, the advice of the AGA to the trailer manufacturer is to skip the expensive testing of these trailers parts and find a new supplier.