

Question of the Month



Q: Why does the overlapped area on some progressively dipped steel have a rougher surface and thicker zinc coating than the other area of the same piece of steel?

A: First, let's make the assumption the steel is fairly thick, as large and long structural sections requiring progressive dipping tend to be. In all likelihood, the surface of the steel dipped first has a very typical zinc coating appearance of shiny gray to silver, and has a coating thickness of eight to ten mils; very standard for high silicon, reactive steel. When the steel is flipped end-to-end and the uncoated steel is immersed in the molten zinc, it will galvanize in normal fashion, very similar to the end dipped first. However, the overlapped surface (dipped twice) may exhibit roughness and have a measured coating thickness of 20 mils or more.



Progressive dip

During the second dip, the overlapped surface area of the steel is once again exposed to the heat of the molten zinc and some of the free zinc Eta layer melts off. However, when the crystalline structure of the intermetallic alloy layers of the overlapped area, in particular the Zeta layer, has more heat applied during the second dip, it grows again and this time at a different rate and in a very random pattern compared to the adjacent steel surfaces being exposed to the zinc for the first time. Essentially, the overlapped area's intermetallic layers have the opportunity (heat applied) to grow twice. So, the coating of the overlapped area is not only thicker than the area only dipped once, but is rougher because of the chaotic grow of the zinc crystal structure in the Zeta intermetallic layer.