



A new technique for colour coating barbed wire can double the service life of farmland fencing at a marginally higher cost

THE CONTEXT



Barbed wire fencing is commonly used by farmers to demarcate their agricultural land and protect crops from animals. While the concrete posts used in fencing last up to 25 years, the barbed wire lasts up to 10 years. Improving the corrosion resistance of barbed wire can therefore prolong the service life of the entire fencing.

Commonly available solutions – such as galvanised wire with zinc coating, which costs an additional Rs 20,000 per MT, or painting the barbed wire at Rs 40,000 per MT – are unaffordable for most farmers. The current innovation helps enhance the service life of barbed wire significantly, at only a marginally higher cost.

THE INNOVATION



This innovation provides a cost-effective coating solution that improves barbed wire durability and offers better aesthetic appeal. Bundles of barbed wire are coated with a patented chemical formulation through a unique coating technology (patent application filed).

The formulation comprises polymer and additives which creates an impervious layer on the wire surface, making it more corrosion resistant. The colour pigment can be added to it to generate a variety of colour options. The new coloured barbed wire delivers significantly enhanced corrosion resistance with less than 5% increase in cost, making it an affordable option.

KEY CHALLENGE



ENSURING A UNIFORM COAT ON BARBED WIRE BUNDLES

The chemical formulation developed by Tata Steel R&D is a fast curing type, and forms the coating with the help of air drying. Modifying its rheology helped achieve uniform spread and thickness of the coating layer. The process uses a specially developed technique involving half-circumferential dipping of the wire bundles inside the chemical formulation with rotation and simultaneous drying. This creates a uniform multi-layered coat despite the intricate shape of the barbed wire bundles. Further uniformity is achieved by spinning and removing excess chemical through centrifugal action. This unique technology is developed for mass scale handling of complex shape barbed wire bundles.



THE IMPACT



With this innovation, the life of a barbed wire fence is expected to double to around 20 years. With an incremental cost of only 5%, this solution benefits farmers who constitute a majority of the users. This product gives differentiated attractive look to the fence that itself makes it a unique product.

The alternative option – a thicker zinc coating – would increase the product price by at least 15-20% without improving aesthetic. The current innovation thus also promotes the conservation of zinc, a fast depleting natural resource. A price premium for the colour-coated wire can further improve Tata Steel's profitability on this product line.