

Controlling Thickness Temper and Surface on Ultra Thin Steel Strip

A technical white paper from Yongxin Precision Material (Wuxi) Co., Ltd.

Why Thin Gauge Behaves Differently

At 0.5 mm a two micron variation is a rounding error. At 0.05 mm it is four percent of the section, and it changes how the strip forms, how it springs back and how it welds. Thin gauge strip therefore cannot be bought as ordinary cold rolled material with a smaller number written on the order. Three specifications carry almost all of the risk: thickness and its tolerance, temper and the mechanical properties behind it, and surface finish.

Thickness and Tolerance

Yongxin rolls thin strip on a 4-Hi 650 mm reversing mill imported from COSMEC in Italy and a 20-Hi 650 mm Sendzimir mill imported from the USA. The 20-Hi cluster configuration exists specifically because small work rolls supported by a cluster are what allow a mill to hold gauge at very thin section. Where a customer states a tolerance we roll to it. Where no tolerance is stated we apply the Yongxin standard tolerance and confirm it in writing with the quotation. Agreeing the measuring position, edge or centre, removes the most common cause of a disputed delivery.

Temper and Mechanical Properties

Temper is the amount of cold work left after annealing and temper rolling. It changes hardness, yield strength, springback and drawability without changing the alloy, which is why adjusting temper is a safer design move than changing grade. Ultra thin stainless steel strip is supplied across ANN, 1/4H, 1/2H, 3/4H, FH and EH. Buyers may specify the temper directly or specify yield strength, tensile strength, elongation and hardness and let the mill select the temper. Annealing is carried out in a horizontal continuous annealing furnace and in bell type furnaces, followed by temper rolling and stretch bending levelling on a leveller imported from Burghardt and Schmidt in Germany.

Surface Finish

Every process downstream of the mill reads the surface. Plating adhesion, paint adhesion, adhesive bonding, laser welding and photochemical etching all respond to roughness, grain direction and residual rolling oil. Yongxin produces finish and roughness to the customer requirement rather than to a fixed house standard, and rolling oil is removed on the degreasing line before delivery. Where the finish is easier to show than to describe, the customer sends a control sample chip and the mill rolls a sample to match it.

The Sample Approval Loop

The single most effective control on all three specifications is the approval sample. A production sample is rolled against the written specification or the control chip and sent to the customer. Bulk production waits for approval. This converts a specification argument that would otherwise happen after a container has shipped into a short exchange before any bulk material is committed.

Why Single Site Processing Matters

Cold rolling, annealing, degreasing, chrome plating, temper rolling, levelling, slitting, packing and laboratory testing all take place inside the 30,000 square metre Wuxi plant. When a trial part cracks or a coating fails, the variables can be reviewed against one process record rather than negotiated between subcontractors.

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