

**Third Winner**

**Project Title**

**R&D**

**Finishing Mill Interstand Cooling System**



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### **Abstract**

Today, one of the most important parameters in hot coil production is the surface quality. During rolling, many defects appear and affect the surface quality. One of the major defects is the Tertiary scale (salt & pepper). This defect is so much serious in special steel grades such as MB, tinplate, galvanized and painted steel that the surface quality has a major role in their applications.

This defect appears in early finishing mill stands, when the rolling temperature is as high as the iron oxide phases appear and grow (1000 C). In this situation when the strip is between two work rolls, the rolled-in scale appears.

In order to solve this problem a system has been designed, manufactured and installed between finishing mill stands. A mathematical model has been designed for this system so that the flow rate of the nozzles and also the water pressure is calculated according to the entry temperature, strip velocity, roll forces in stands and other related parameters which are applied in using the control valves.

Using this model we can control the surface temperature in the best way such that the exit temperature will be as low as the growing speed of the iron-oxide phases does not allow the rolled - in scale to appear.

This system has many advantages such as, being not so much complicated, easily manufacturing, having low maintenance cost, using water as a low cost material, easily working, automatic adjustment for different rolling conditions and strip parameters, having no effect on the final temperature of the strip (because of that in this procedure only the surface of the strip is being cooled; skin cooling), having good affect on surface quality and lower work rolls consuming.