

Induction Heating of Steel for Improved Mechanical Properties with Less Energy Requirement

This technical application of induction heating and furnace tempering has the potential to improve the mechanical properties of A36, 4130, and 4140 steel compared to normal furnace annealing and also reduce energy requirements.

Keywords: A36 steel, 4130 steel, 4140 steel, induction heating

Process Implementation Readiness



Background and Technology Description

Mechanical properties were compared for the three steel alloys (A36, 4130, 4140) using induction heating plus water quench vs. furnace annealing plus oil quench. Then various tempering temperatures were used for final property comparisons. Three mechanical properties were compared; tensile strength, elongation, and yield strength.

As an example, the effect of induction heating on 4140 steel was compared to conventional heat treatment, as shown in the figure. In this case, both the conventional heating and induction were optimum at 1650°F but the tensile strength increased by 7% with induction in the as-quenched condition. At a 200°F temper the tensile strength with induction was 15% higher.

Technology Benefits and Value

- Improved mechanical properties
- Potential reduction in energy use with induction heating compared to traditional furnaces

Target Customers

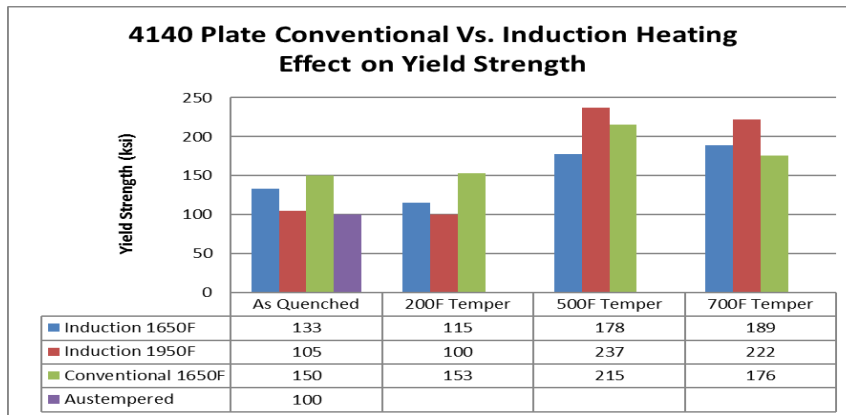
Manufacturers and facilities that rely on heat treatment to produce parts. This technology has already been implemented at a NY company.

Intellectual Property

This technology is currently not under patent.

Opportunity

NYSP2I is interested in working with qualified parties for continued technology and product development of this process.



Dr. Eugene Park, Assistant Technical Director www.nysp2i.org 585.475.2512

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