



PROJECT PROFILE

HEAT TREATMENT OF CLUTCH PLATES

CLIENT CHALLENGE

Our client is a key supplier of water hydraulic technology where high pressure water is used to clean or de-scale hot steel. Their specific problem involved estimating the amount of cooling water to apply to freshly formed 750C clutch plates to achieve a target material hardness. The goal of the client was to achieve a target starting point for the amount of water spray to be utilized in physical testing. The client required expertise in:

- Heat Transfer Analysis
- Elevated Temperature Metallurgical properties of SAE1035 steel

SOLUTION

Palladium was retained for our expertise in problem solving and analysis. The following tasks were performed during the project:

- Determination of the change in metallurgical properties of SEA1035 at elevated temperature ranges from austenitic to pearlite structure
- Estimation of the relationship between heat removal rate and impact density at high stock temperatures based on theoretical and research material

PROJECT HIGHLIGHTS

Palladium staff accomplished the following project deliverables:

- Metallurgical research on SAE 1035 at elevated temperatures
- Heat transfer calculations based on theoretical and research materials supplied in excel format that provides determination of HTC water impact density, water spraying time and water spray rate

Palladium's work enabled the client to:

- Produce an educated and realistic starting point for physical testing.
- Use of our supplied excel based calculation for continued 'what-if' scenarios by the client.

