NOMENCLATURE

Issues on the Surface Integrity of Case Hardened Steel Materials

A = Furnace Temperature in degree Celsius
AISI = American Iron and Steel Institute
ANOVA = Analysis of Variance
B = Quenching time in minutes
C = Tempering temperature in degree Celsius
CA_{opt} = Case depth value obtained at optimum process variable A
CB_{opt} = Case depth value obtained at optimum process variable B
CC_{opt} = Case depth value obtained at optimum process variable C
CD_{opt} = Case depth value obtained at optimum process variable D
CE_{opt} = Case depth value obtained at optimum process variable E
C.F = Correction factor
D = Tempering time in minutes
E = Preheating temperature in degree Celsius
EN = European Standards published by the European Committee for Standardization
fm = Volume fraction of martensite
G1 = Group 1
G2 = Group 2
HA_{opt} = Hardness value obtained at optimum process variable A
HB_{opt} = Hardness value obtained at optimum process variable B
HC_{opt} = Hardness value obtained at optimum process variable C
HD_{opt} = Hardness value obtained at optimum process variable D
HE_{opt} = Hardness value obtained at optimum process variable E
HRA = Rockwell Hardness A scale
HRC = Rockwell Hardness C scale
LA_{opt} = Helix variation (Left) value obtained at optimum process variable A
LB_{opt} = Helix variation (Left) value obtained at optimum process variable B
LC_{opt} = Helix variation (Left) value obtained at optimum process variable C
LD_{opt} = Helix variation (Left) value obtained at optimum process variable D
LE_{opt} = Helix variation (Left) value obtained at optimum process variable E
Ms = Starting temperature of martensite formation
Mf = Temperature of martensite transformation ends
N = Number of levels
P = Power potential in kW/inch$^2$
Q = Quench flow rate litres/minutes
r = Number of replicates
RA_{opt} = Runout value obtained at optimum process variable A
<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
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<tbody>
<tr>
<td>RB&lt;sub&gt;opt&lt;/sub&gt;</td>
<td>Runout value obtained at optimum process variable B</td>
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<tr>
<td>RC&lt;sub&gt;opt&lt;/sub&gt;</td>
<td>Runout value obtained at optimum process variable C</td>
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<tr>
<td>RD&lt;sub&gt;opt&lt;/sub&gt;</td>
<td>Runout value obtained at optimum process variable D</td>
</tr>
<tr>
<td>RE&lt;sub&gt;opt&lt;/sub&gt;</td>
<td>Runout value obtained at optimum process variable E</td>
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<tr>
<td>S</td>
<td>Scan speed in meter/minutes</td>
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<tr>
<td>SSE</td>
<td>Sum of Squares of Error</td>
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<tr>
<td>SST</td>
<td>Total sum of squares</td>
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<tr>
<td>SST&lt;sub&gt;r&lt;/sub&gt;</td>
<td>Sum of Squares of Treatment with replicates</td>
</tr>
<tr>
<td>SSA</td>
<td>Sum of Squares of Variables</td>
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<tr>
<td>Tq</td>
<td>Quenchant temperature at which fraction of martensite is formed</td>
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<tr>
<td>TTT</td>
<td>Temperature-Time-Transformation diagram</td>
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<tr>
<td>VHN</td>
<td>Vickers Hardness Number</td>
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<tr>
<td>β</td>
<td>Predicted mean response</td>
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