NOMENCLATURE

A  Furnace Temperature in degree Celsius
A_1  Lower critical temperature
A_cm  Upper critical temperature
AISI  American Iron and Steel Institute
ANOVA  Analysis of Variance
B  Quenching time in minutes
C  Tempering temperature in degree Celsius
CCC  Continuous-Cooling-Curves
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  Interplanar spacing
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
G_1  Group 1
G_2  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
m* Gradient of a least squares straight line fit through the data points
Ms starting temperature of martensite formation
M_f Temperature of martensite transformation ends
n Order of reflection
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
RB_{opt} Runout value obtained at optimum process variable B
RC_{opt} Runout value obtained at optimum process variable C
RD_{opt} Runout value obtained at optimum process variable D
RE_{opt} Runout value obtained at optimum process variable E
S Scan speed in meter/minutes
SSE Sum of Squares of Error
SST Total sum of squares
SST_r Sum of Squares of Treatment with replicates
SSA Sum of Squares of Variables
Tq Quenchant temperature at which fraction of martensite is formed
TTT Temperature-Time-Transformation diagram
VHN Vickers Hardness Number
\lambda Wavelength of incident X – Rays
\theta Angle between incident or reflected beam and reflecting planes
d \phi \psi Interplanar spacing in the described by the angles \phi and \psi
\nu Poisson’s ratio.
\beta Predicted mean response