APPENDIX

Weibull Statistic Method

The Weibull statistic method is being commonly applied in scientific calculus owing to its reliability and relatively few parameters for data adjustment. It is based on the cumulative distribution function

\[ F(x) = 1 - \exp \left[ -\left( \frac{x}{\theta} \right)^\beta \right] \]  

(1)

where \( \theta \) and \( \beta \) are statistical parameters known as the characteristic unit (scale parameter) and Weibull modulus (form parameter), respectively.

Double logarithmic application in Eq (1) gives a linear relationship.

\[ \ln \left[ \ln \left( \frac{1}{1-F(x)} \right) \right] = \beta \ln(x) - \beta \ln(\theta) \]  

(2)

where \( \beta \) is the slope of the straight line represented by Eq (2) and \(-\beta \ln(\theta)\) the linear coefficient. Both parameters, \( \beta \) and \( \theta \), cam be graphically interpreted and easily determined by computer method. For statistical analysis of the indentation depth in the present work the software Weibull Analysis was used.