



## Laser Pulse Heating of Surfaces and Thermal Stress Analysis

By Yilbas, Bekir S. / Al-Dweik, Ahmad Y.

Condition: New. Publisher/Verlag: Springer, Berlin | This book introduces laser pulse heating and thermal stress analysis in materials surface. Analytical temperature treatments and stress developed in the surface region are also explored. The book will help the reader analyze the laser induced stress in the irradiated region and presents solutions for the stress field. Detailed thermal stress analysis in different laser pulse heating situations and different boundary conditions are also presented. Written for surface engineers. | PREFACE.- ACKNOWLEDGEMENTS.- INTRODUCTION.- EQUILIBRIUM LASER PULSE HEATING AND THERMAL STRESS ANALYSIS.- INTRODUCTION.- STEP INPUT LASER PULSE HEATING.- STRESS FREE BOUNDARY AT THE SURFACE.- STRESS CONTINUITY BOUNDARY AT THE SURFACE.- TIME EXPONENTIALLY VARYING LASER PULSE HEATING.- STRESS FREE BOUNDARY AT THE SURFACE.- STRESS FREE BOUNDARY AND CONVECTION AT THE SURFACE.- STRESS BOUNDARY AT THE SURFACE.- ENTROPY ANALYSIS DUE TO THERMAL STRESS FIELD.- FINDINGS AND DISCUSSIONS.- STEP INPUT PULSE HEATING.- TIME EXPONENTIALLY VARYING LASER PULSE HEATING.- ENTROPY ANALYSIS DUE TO THERMAL STRESS FIELD.- ANALYTICAL SOLUTION OF CATTANEO AND THERMAL STRESS EQUATIONS.- INTRODUCTION.- SURFACE HEAT SOURCE CONSIDERATION.- STEP INPUT PULSE HEATING.- EXPONENTIAL PULSE HEATING.- VOLUMETRIC SOURCE CONSIDERATION.- STEP INPUT PULSE HEATING.- EXPONENTIAL PULSE HEATING.- ENTROPY ANALYSIS.- FINDINGS AND DISCUSSION.- SURFACE HEAT SOURCE CONSIDERATION.- VOLUMETRIC HEAT SOURCE CONSIDERATION.-...



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