Measurement of Grinding Temperature of Ceramics

1988 Fiscal Year Final Research Report Summary

Measurement of Grinding Temperature of Ceramics

Research Project

Project/Area Number

61550095

Research Category

Grant-in-Aid for General Scientific Research (C)

Allocation Type

Single-year Grants

Research Field

機械工作

Research Institution

Kanazawa University (1988)
Osaka University (1986-1987)

Principal Investigator

TAKASHI Ueda Kanazawa University, Faculty of Engineering, Associate Professor, 工学部, 助教授 (60115996)

Project Period (FY)

1986 – 1988

Keywords

Ceramics / Grinding Temperature / Optical Fiber / 赤外線輻射温度計

Research Abstract

Heat gqnerated in the contact area between a diamond wheel and a ceramic is a main cause of the deterioration in the finished surface of the ceramic and the decrease of the lifetime of the diamond wheel. The temperature at the cutting point is a significant factor in any examination of the cutting mechanism of diamond grains in ceramic grinding. In this study, the temperature of the working grains on the diamond wheel just after cutting and the heat pulses produced by cutting grains in the surface layer of a ceramic are measured using an infrared radiation pyrometer, with the radiation transmitted through an optical fiber. The ceramics used as a workpiece are Si_3N_4 and SiC. The maximum temperature at 40 depth below the ground surface is approximately 500° C, which is much smaller than that of the carbon steel. Since the conductivity of the ceramic is very small. The temperature of the working grains on a diamond wheel is greater than 1200° C.

Research Products (6 results)

All | Other

All | Publications (6 results)

[Publications] 上田隆司: 材料. 36. 404-409 (1987)

[Publications] 上田隆司: 精密工学会誌. 53. 724-730 (1987)

[Publications] 上田隆司: 日本機械学会論文集 C編. 55. (1989)

[Publications] Takasi Ueda: "Development of Infrared Radiation Pyrometer Using Optical Fiber" Journal of The Society of Materials Science. 36. 404-409 (1987)

[Publications] Takashi Ueda: "Infrared Radiation Pyrometer Using Optical Fiber----Polishing Method for Incidence Face of Optical Fiber--" Journal of The Japan Society of Precision engineering. 55. 724-730 (1987)

[Publications] Takashi Ueda: "Studies on Grinding Mechanism Using Infrared Radiation Pyrometer With Optical Fiber" Journal of The Japan Society of Mechanical Engineers. 55. (1989)

URL: https://kaken.nii.ac.jp/report/KAKENHI-PROJECT-61550095/615500951988kenkyu_seika_hokoku_

Published: 1990-03-19