Title	Burning rate of composite solid propellant
Sub Title	
Author	柏木, 孝(Kashiwagi, Takashi)
Publisher	慶応義塾大学藤原記念工学部
Publication year	1965
Jtitle	Proceedings of the Fujihara Memorial Faculty of Engineering Keio University (慶応義塾大学藤原記念工学部研究報告). Vol.18, No.71 (1965.),p.86(22)- 86(22)
JaLC DOI	
Abstract	
Notes	Summaries of Doctor and Master Theses Master of Engineering, 1965 Mechanical Engineering
Genre	Departmental Bulletin Paper
URL	https://koara.lib.keio.ac.jp/xoonips/modules/xoonips/detail.php?koara_id=KO50001004-00180071- 0022

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## Burning Rate of Composite Solid Propellant

Takashi KASHIWAGI\*

The another examined how to be influenced the burning rate of composite solid propellant, which consists of Ammonium Perchlorate as oxidizer and Polyurethan as binder, by the oxidizer particle size and the gas flow parallel to the propellant surface. In this experiment the two dimensional internal burning type chamber, designed to be able to see the burning behavior from both sides through acryl windows, was used. This chamber magnitude is of the laboratory scale, so that it is very small.

When there is gas flow parallel to the propellant surface, the burning rate change was experienced recently. This may be mainly by reason of abration and heat transfer change. It is believed that this behavior occures in rather high velocity range of flow. Solid propellant burns by the diffusion between vapor of oxidizer and binder, and then in low pressure range the regression rate of oxidizer is smaller than that of binder, so in microscopic view point oxidizer particle protrudes on the propellant surface. Does the burning rate change occur or not in this case, and in addition in much lower flow velocity than usuall? Also, does the influence of the gas flow occur or not?

It is concluded the burning rate to change in this low flow velocity and according to the oxidizer particle size. On the basis of this experiment, from the burning mechanism of solid propellant, the author assumes the intensity of the diffusion between vapors of oxidizer particle and binder changes with the particle size and flow velocity.

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