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Determination of thermal diffusivity of continuous fiber-reinforced ceramic matrix composites by the laser flash method

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Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee in according with the Industrial Standardization Law.

Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have technical properties. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have the said technical properties.

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In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

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1 Scope This Japanese Industrial Standard specifies measuring method of thermal diffusivity from room temperature to 1300 K for continuous fiber-reinforced ceramic matrix composites composed of continuous fiber-reinforced ceramic and ceramic matrix by laser flash method.

2 Normative references The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS B 0601 *Geometrical Product Specification (GPS)—Surface texture : Profile method—Terms, definitions and surface texture parameters*

JIS B 7502 *Micrometer callipers*

JIS B 7506 *Gauge blocks*

JIS R 1600 *Glossary of terms relating to fine ceramics*

JIS R 1611 *Test methods of thermal diffusivity, specific heat capacity, and thermal conductivity for fine ceramics by laser flash method*

JIS Z 8401 *Guide to the rounding of numbers*

3 Terms and definitions For the purpose of this Standard, the definitions given in **JIS R 1600** and the following definitions apply.

a) **effective thermal diffusivity** at a heterogeneous material composed of plural phases and different composition, structure and properties at the place, effective thermal diffusivity specified as the interior of sufficiently small domain compared with the test specimen is similar to be macroscopically uniform, and the domain indicates a heat response as if a uniform materials (see figure 2)

When the effective thermal diffusivity of each domain is equal, the thermal diffusivity of the whole test specimen is specified and it is equal to the thermal diffusivity of each domain.

b) **temperature rising curve** a curve to indicate the time change of the back surface temperature of the test specimen by pulse heating

c) **model function** analytical solution of the temperature rising curve calculated un-