

Function - Material - Application - Issue (No.4)

Function	Materials	Expected Features	Application	Competing Materials	Technical Issues	Others
Hard/Wear Resistance	Al ₂ O ₃ , SiC, C-BN	<ul style="list-style-type: none"> • Longer life of structural parts for various machines • Improving accuracy of products 	Cutting tool, abrasive, mechanical seal	Superhard alloy	• High efficiency grinding to be developed	
High Strength	Si ₃ , SiC, Sialon	<ul style="list-style-type: none"> • Improving heat efficiency by high temp. engine • Resource conservation • Longer life of various mechanical parts 	Engine component, power turbine component, combustion nozzle	Heat resistant steel, superalloy	<ul style="list-style-type: none"> • Unification of evaluation • Nondestructive evaluation • Design technology • Accumulation of data 	
Lubricative	h-BN, MoS ₂	<ul style="list-style-type: none"> • High temp. lubrication without using lubricant • Improving operation efficiency • Longer life of machine 	Solid lubricant, mould release	Carbon	<ul style="list-style-type: none"> • Improving sintering technology • Composite with other material 	
Low Thermal Expansion	Al ₂ O ₃	<ul style="list-style-type: none"> • High accuracy of machine • Longer life 	Parts for precision machines (block gauge, precise surface plate, V-block)		• Improvement of precise processing	
Thermal Resistant	Al ₂ O ₃ , MgO	<ul style="list-style-type: none"> • Longer life to material • Improving heat efficiency 	Sintering vessel, furnace tube, protection tube			
Insulation	fiber, potassium titanate fiber				• Improved works	
Thermal Conductive	BeO, AlN	• High performance parts	IC substrate/package			Effect of BeO powder on human body
Thermal Shock Resistant	Cordierite, Lithium aluminosilicate	• Longer life of parts	Honeycomb for catalyst carrier, plate for sintering, burner, block		• Commercialization of heat exchanger	
	UO ₂ , C, B ₄ C, Eu ₂ O ₃	• New energy development with ceramics	Nuclear fuel retardant fuel lagging, shielding material, control rod material		<ul style="list-style-type: none"> • Manufacturing technology for large structures to be developed • Ensuring high reliability 	