

Technology Offer

Wear Resistant Ceramics using Fly Ash

Title of Technology to be offered	Wear Resistant Ceramics using Fly Ash
Type of Technology	Indigenous
Area of Technology	Materials & Material Science
Details of Present/existing Technology. Shortfall/Technological gaps in the existing technology	The existing technology uses costly raw materials such as alumina, kaolin, etc. causing the higher cost of production. Also the sintering temperature in existing technologies is quite high (1700-1800 ⁰ C), thus more energy consumption.
Approach adopted in new technology to evade technological gap in the existing one	Fly Ash has been used as one of the major raw material to partially substitute the alumina. The Fly Ash consists mainly of silica and alumina, the alumina present in Fly Ash was used as source and Silica as bonding materials.
Advantage/Benefits of new technology (with in 150 words)	The present technology uses fly ash as one of the major raw materials which is a waste of thermal power plants and causing serious environmental problem. So the major advantage is mitigation of pollution. Gainful utilisation of fly ash, cost and energy savings are the added advantages.
Constraints in technology (if any)	The free carbon content should be <5% and iron content should be <2% in fly ash otherwise it will adversely affect the product quality.
Brief description/abstract (150 words)	The type of wear resistant ceramic products can be produced using 10,25 and 40wt% fly ash for high, moderate and low wear resistant applications. The products are harder than tool steel and next to diamond on Moh's scale of hardness. These extremely hard, dense and impenetrable ceramics, which finds a number of industrial applications, substantially decrease the maintenance cost of equipment and increase the life of components 8-10 times to that of metal. There can be many successful application of the presently developed wear resistant ceramics in place of alloy sttel, basalt and high alumina liners.
Major raw material	Fly Ash, Technical Alumina, Alumino-silicate minerals, additives
Major Plant Equipment/Machinery	Weighing machine, Ball Mill, Filter press, Granulator, Mixture, Hydraulic Press, Kiln.
Area of application	
Details of specification application	Areas which are prone to wear such as material handling equipment, pipe lines, chutes, bunkers, hoppers, ball mills, etc.
Status of Development	Pilot Plant Scale
Ecological/Environmental Impact (if any, specify	The present technology will help in reducing pollution control as it uses fly ash, which is waste material

briefly)	
Patenting details	1264/DEL/93, I ndia
Extent of Commercialisation	Under the process of commercialisation
Technology Transferring Agent	NML/CSIR
Technology Transfer Assistance Offered (Optional)	(a) Process Know-How, (b) Details of the Equipment, (c) Plant lay-out, (d) Assistance in setting up a plant on separate terms
Key words	Fly Ash, Alumina, Wear Resitant, Pollution Control, Ceramics
Country of origin	India