

International Advanced Research Centre for Powder Metallurgy & New Materials (ARCI)

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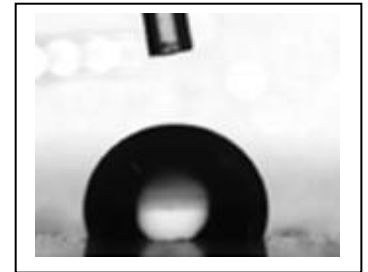
Abrasion Resistant, Hydrophobic Coatings on Carbon-Epoxy Composites (CEC)

Overview

Carbon epoxy composites (CEC) have excellent advantages such as lightweight, high strength and weathering resistance when compared to aluminum alloys and high-grade steels. Moreover, body parts made of CEC when used for aerospace applications can be tailor-made with limited number of joints. But CEC are poor in abrasion and erosion resistance and degrade when contacted with hydraulic fluids such as water or any oil. Sol-gel formulations developed by ARCI when deposited on CEC were found to substantially improve scratch/abrasion resistance. Transparent or coloured abrasion resistant, hydrophobic coatings on polyurethane painted carbon-epoxy composite coupons could be generated using UV polymerizable silanes and their performance was found to be promising for aerospace applications. The developed coating technology was found to be amenable for scale-up and automation.

Key Features

- Eco-friendly
- Durability of hydrophobicity and abrasion resistance
- Amenable to coat large areas with easy automation
- Good adhesion to the substrate materials
- Can be applied as bond coat to promote adhesion with paints
- Can be made as coloured coatings



UV + room temperature cured sol-gel coated carbon epoxy substrate showing a water contact angle of 110°

Potential Applications

- Automobile components
- Aerospace components
- Communication gadgets



Coloured abrasion resistant sol-gel coating applied directly on carbon epoxy composite substrate

Intellectual Property Development Indices (IPDI)

- Performance and stability validated at laboratory scale

Status	1	2	3	4	5	6	7	8	9	10
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Major Patents / Publications

1. An improved abrasion resistant and hydrophobic composition for coating plastic surfaces and a process for its preparation, Indian Patent application number 1278/ DEL/ 2011 dtd 02-05-11

Centre for Sol-Gel Coatings (CSOL)

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