

Development of Abradable Seal Sprayed Coating for Turbo Compressor Housing

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Turbo efficiency was improved by narrowing gap between impeller and coated shroud of housing. The shroud of housing was coated by plasma spraying with a good machinable composite material which was abraded by impeller.

In order to obtain an excellent coating quality, optimum coating material was chosen and plasma spraying process was established through optimizing spray conditions. Many screening rig tests and durability bench tests were carried out and proved to be acceptable. So abradable coating process has been applied successfully for mass produced turbo charger.

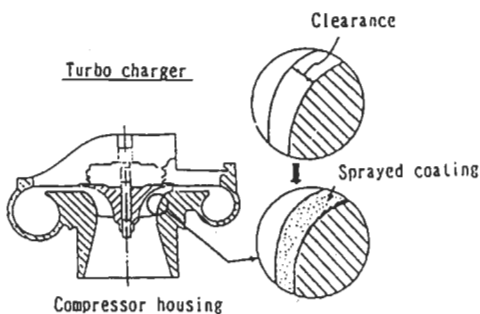


Fig. 1 Application of abradable coating for Turbo Compressor housing

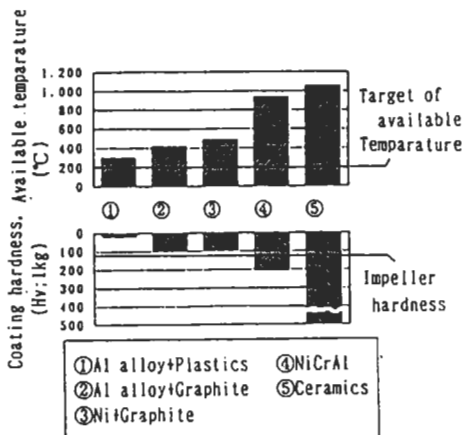


Fig. 2 Screenings of materials

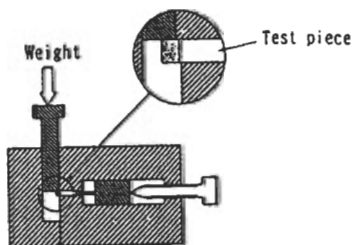


Fig. 3 Test method for adhesive strength of sprayed coating

Table.1 Powder Material

Material System	Powder Material
① Alloy+Graphite	1) (Al-Si)+45wt%Graphite 2) Ni+25wt%Graphite
② Alloy+Engineering Plastics	1) (Al-Si)+40wt%polyester ¹⁾ 2) (Al-Si)+40wt%PPS 3) (Al-Si)+40wt%PES ¹⁾ Ekonol

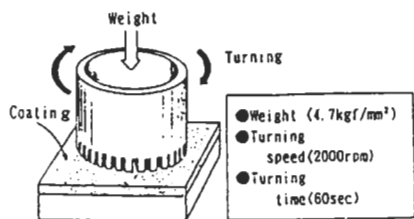


Fig. 4 Test method for abradability of sprayed coating

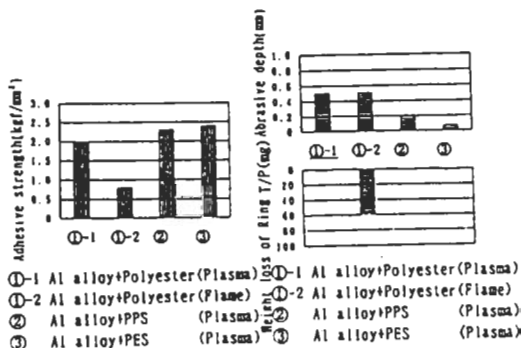
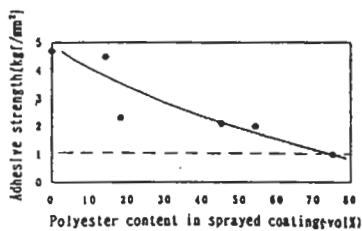
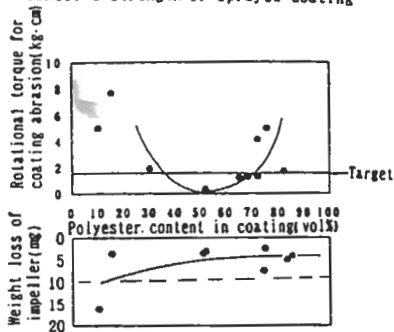


Fig. 7 Adhesive strength of sprayed coatings

Fig. 8 Abradability of sprayed coatings



11 Relationship between polyester content and adhesive strength of sprayed coating



12 Relationship between polyester content and abrasability of sprayed coating

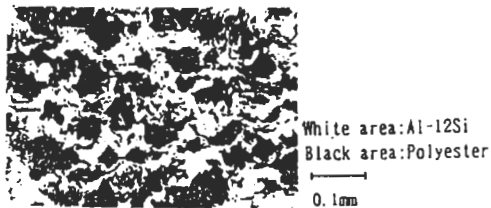


Fig.13 Structure of abrasible seal sprayed coating

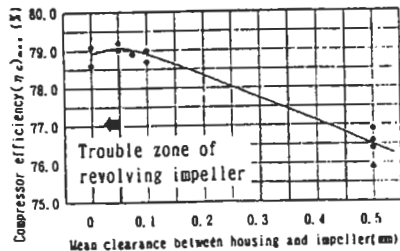


Fig.14 Influence of clearance between housing and impeller on compressor efficiency