WEAR RESISTANT RECYCLED HARDMETAL BASED HARDFACINGS

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In many fields like mining industry, paper manufacturing and road machinery wear of components is a big problem. For that wear resistant materials or coatings are needed to increase lifetime of these components and therefore reduce the need for maintanance and repairs. Unfortunately, many wear resistant materials are expensive and rare, also mining for them has a big enviromental impact. For these reasons my research focuses on using recycled hardmetal scrap, that is produced by disintegrator milling, from old hardmetal tools, in composite thick (> 2 mm) hardfacings. Research so far has focused on the influence of hardmetal content [1] and particle size and shape [2].

Testing in the course of research has been done using abrasive wheel wear testing (ASTM G65 standard), abrasive-erosive wear testing and abrasive-impact wear testing (particle size ~5 mm). In addition some tests have been done using abrasive wheel wear (two body wear, abrasive particles in wheel).

In addition to testing different production technologies, PM-technolgy (liquid phase sintering in vacuum) and PTA-welding (plasma transferred arc) are compared and parameters of these technologies optimizeid to achieve best hardfacings quality.

So far, best results have been achieved with coarse (>1 mm) reinforcement with ~50 vol% reinforcment content. In three body abrasion spherical shape has shown better results compared to angular reinforcement.

References

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