Institut für Materialprüfung,
Werkstoffkunde und Festigkeitslehre

Production and Economical Aspects of MMCs

(Intermediate Project 01.01.12 to 31.06.12)

Topics: Erosion, pump materials, MMC, biomimetics, corrosion,…

Pumping materials: The erosion resistance of a material is a crucial requisite for an economical use of pump materials, especially under industrial (muddwater) conditions. The economical potential is tremendous.

Procedure: First step, different numerical models have been evaluated to predict the erosion behavior. Thereby, we could identify suitable MMCs for pumps and, additionally, reveal their specific economical production paths.

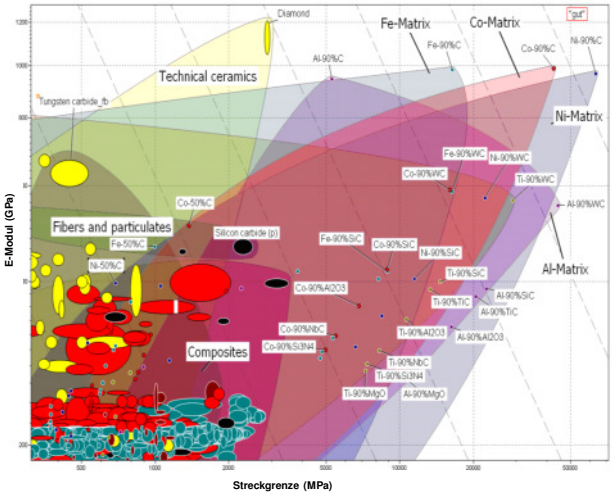

Fig. 1: Ashby-diagram for erosion resistant materials ($R_{p0,2}$ ≥ 350 MPa, Youngs Modulus ≥ 200 GPa).
Colored areas *right*: numerically determined MMCs

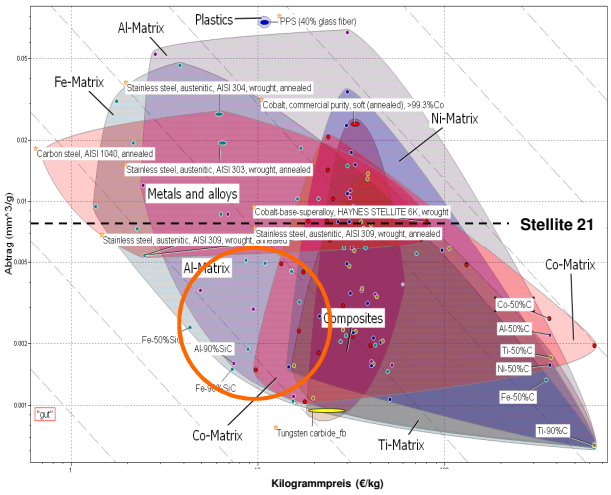

Fig. 2: **E**rosion resistant materials: better erosion resistance than reference material than Stellite 21 (- -). MMCs within ***orange*** circle offer a promising compromise between cost and highly erosion resistant MMCs

Outlook: Refined Finite-Element_Model (FEM) damage model: in contradiction to the pre-project, we intend to distinguish between erosion of the matrix and reinforcement-phase.

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