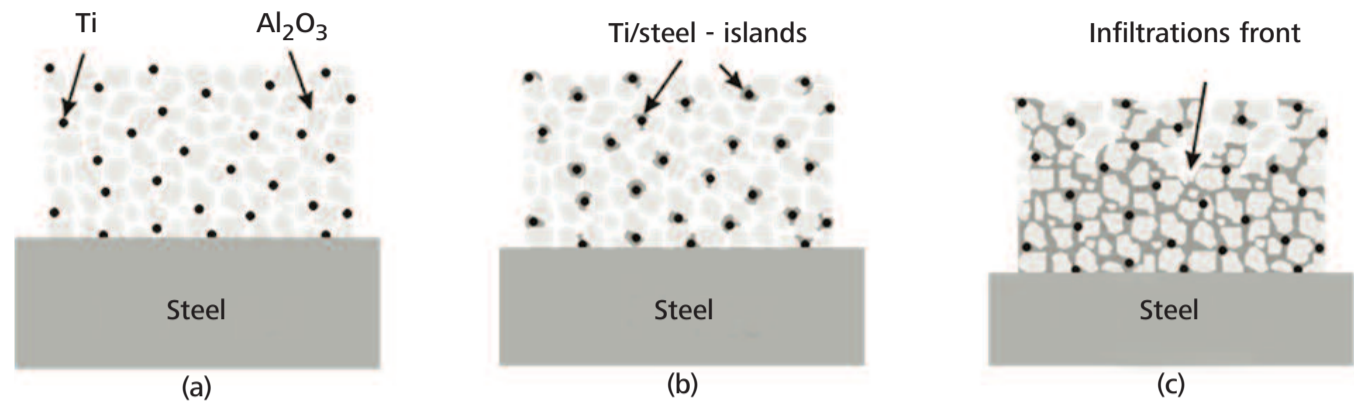


# Ti-Activated Pressureless Infiltration of Ceramic/Metal Composites

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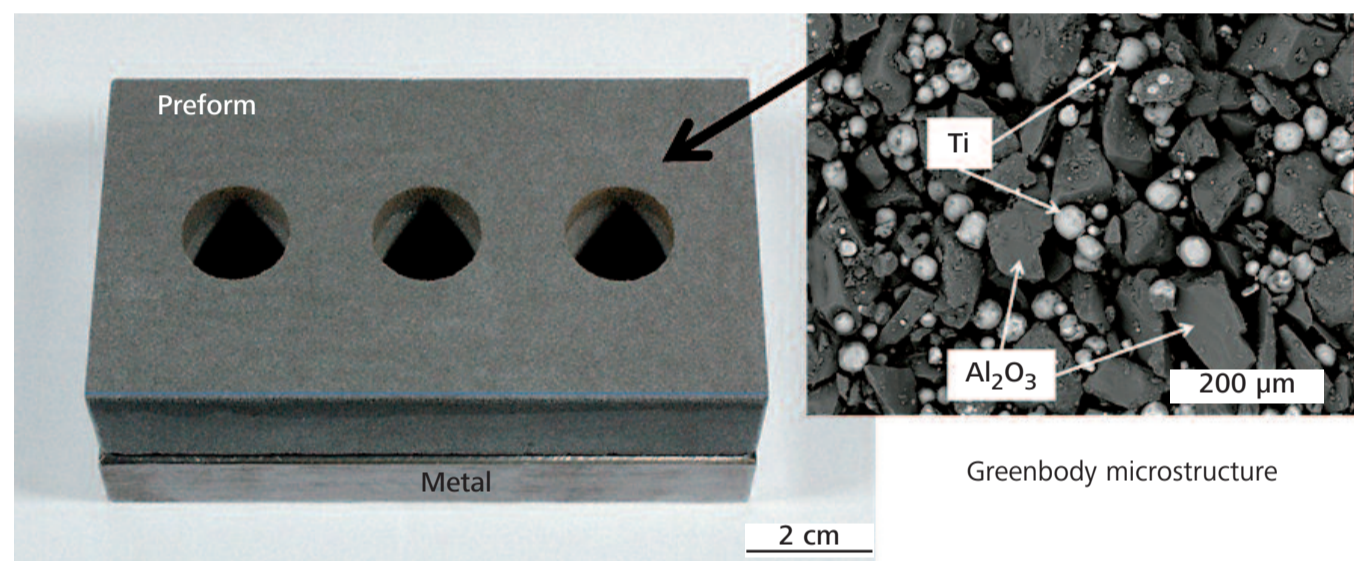
For producing metal matrix composites (MMCs), the poor wetting has to be overcome. Ti-activation of ceramics permits the infiltration of ceramic greenbodies (a) called preforms. During infiltration Ti-particles within the preform are covered by metal melt (b). Further enrichment of the metal melt on the Ti/metal-islands (c) results then in an infiltration



Schematic of Ti-activated infiltration

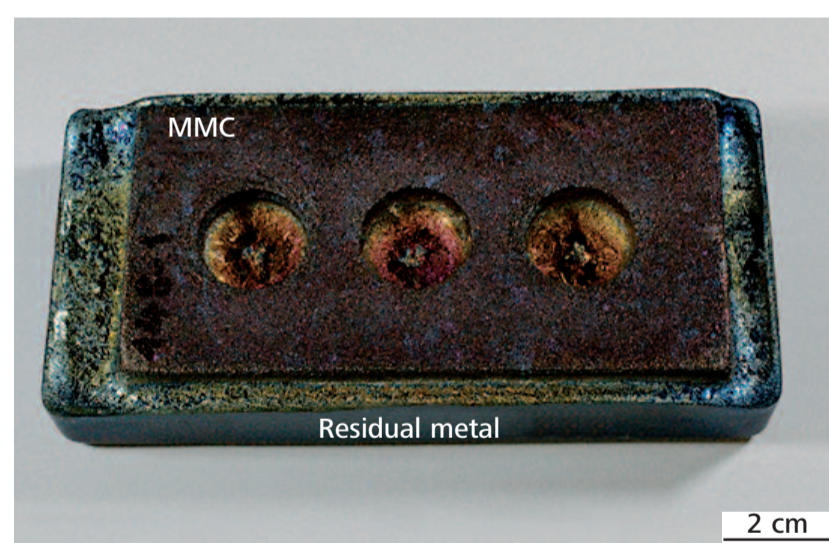
Preforms are produced by uniaxial pressing of the ceramic granulate which incorporates Ti-particles. The greenbody microstructure is shown in the SEM-micrograph containing Ti- and  $Al_2O_3$ -particles (~50% porosity).

The typical infiltration setup is shown in the left image. The matrix-metal is placed beneath the freestanding preform.

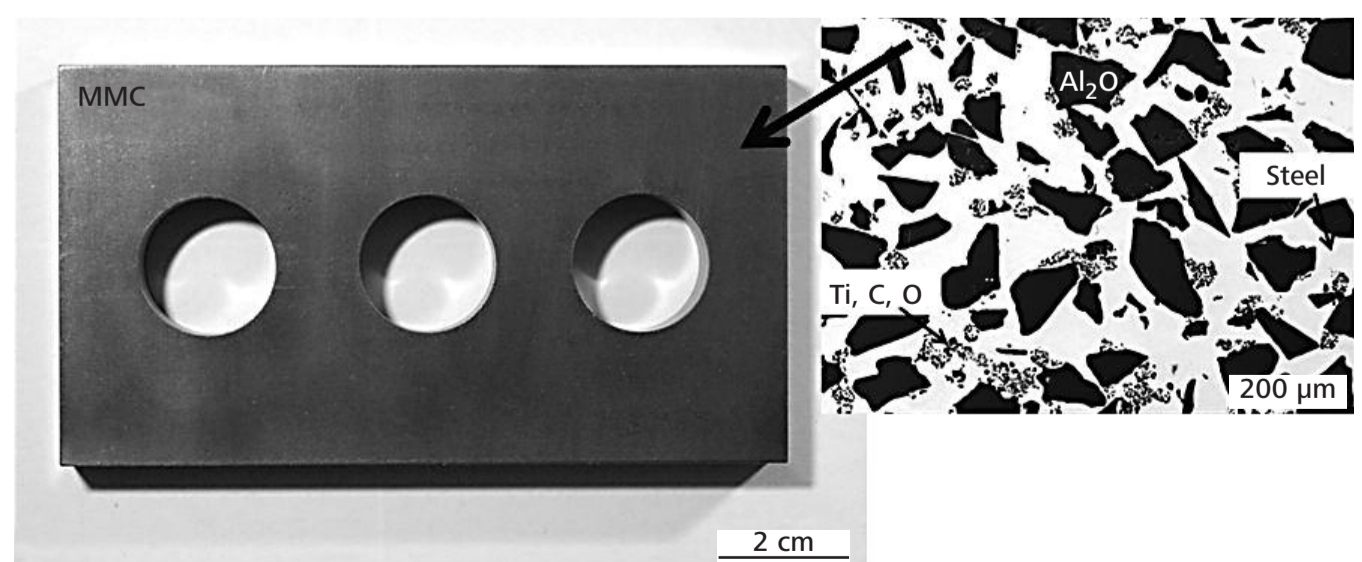


Greenbody microstructure

During infiltration the metal melt penetrates the complete pore volume of the preform. After solidification the final MMC is obtained. By machining, the MMC component can be freed from the excess residual metal.



MMCs are produced near-net-shape and without shrinkage. The metal-matrix substitutes the previous pore volume of the preform creating a dense composite material.



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