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| **Abstract:** |  |
| Cermet and steel material bonding is a challenging task, due to their large difference of physical properties, e.g. coefficient of thermal expansion. In this study, a hot compaction diffusion bonding method was employed to fabricate a small-dimensional bimetallic composite of WC-10Co and high strength AISI 4340 steel, where the cermet was used in powder form and the steel as solid. The bimetal composite was characterised by microstructural analysis and mechanical properties evaluation. The interface microstructure reveals a successful metallurgical bonding between the cermet and steel materials. The influence of sintering temperature (1050–1250 °C) was examined at intervals of 50 °C. This study shows that the properties of sintered powder and the bonding quality with the steel improve with an increase in sintering temperature. A bonding beneficiary reaction layer was observed to grow at the joining interface by mutual diffusion of the alloying elements, which increases with the increasing temperature. The maximum width of the reaction layer observed was 4.13 μm and consists mainly of intermetallic ternary carbides. The bonding shear strength of the interface is found to be slightly higher than claimed in previous studies. The developed bimetal composite could be used in applications where a combination of high strength and hardness is required | |