Recent investigations show that ceramic/ceramic joints have high potential for applying in industries for shaping and forming of large ceramic components with required geometries and forms. Cost and difficulty in manufacturing complex components, either in one step or by joining of ceramic-metal and ceramic-ceramic, determine inhibition for more widespread use. It is important how to joint component without problems for longer time and to know the role of interface as the main factor of controlling the properties in the joints. The purpose of this paper was joining two ceramics (SiC to SiC & Al2O3 to Al2O3) with metal fillers and to investigate the interface of SiC/SiC and Al2O3/Al2O3 with the same metal interlayer (Ag-Cu-Ti) and its effect on the properties. Both joints are performed by brazing method and under certain conditions in a furnace with controlled atmosphere, using the appropriate filler metal. The properties and characteristics of connection has finally been studied by using mechanical test (shear strength test) and microscopic examination (SEM) and phase analysis (XRD) and elemental distribution was conducted by EDAX. Heat treatment was performed (at different time and temperature) according to phase diagram to gain the desirable joint. The results showed that the proper joining of Al2O3/Al2O3 and SiC/SiC was obtained applying a metal layer of Ag-Cu as well as an active metal of Ti-6Al-4V. The second one was used to increase the wet ability and proper strength. Microscopic investigations revealed penetration and activation of elements from interface to the bulk of ceramic body and this “in turn” was the major reaction in the joints. Both joints showed the deepest penetration of Ti atoms from interface to ceramics. According to the XRD results, TiC and Ti5Si3 were the most important phases in the SiC/SiC interface and TiO and V2O5 in the Al2O3/Al2O3 interface. The strength of both joints was increased till optimum time and temperature condition and diminished after that by forming of some phases as TiC in (SiC/SiC) and TiO in (Al2O3/Al2O3) which inhibit the formation of more strong interface. The optimum time and temperature were suggested to be 900 °C and 90 min for SiC/SiC and 900 °C and 60 min for Al2O3/Al2O3.