## 204-030 THERMO-MECHANICAL PROPERTIES AND MICROSTRUCTURAL OF GEOPOLYMER COMPOSITES

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The need for lighter, stiffer and stronger structural elements in different applications has contributed to increase the use of composite materials, among which sandwich panels are included [2] [3]. This work presents the results of a study on the mechanical behavior and microstructural of composites with carbon fiber reinforced polymer (CFRP) skins with epoxy resin and inorganic resin, with different values of temperature of exposition. To this end, an experimental campaign was executed, compressive test on CFRP and microstructural analysis for scanning electron microscope (SEM). The thermomechanical results, after the exposure to high temperatures, show that the inorganic composites remain intact and maintain their adhesive function, contrary to the epoxy matrix composites, which lose this function due to their thermal degradation. The inorganic composites do not present significant degradation until 500?C is reached. At temperatures higher than this, their degradation took place without the emission of smoke and toxic gases, which is the case for the epoxy matrix composites at temperatures around 240?C. Meso and microstructure analyses showed that even though it was difficult for them to impregnate carbon fibers, the inorganic resins present good adherence to carbon fibers, even in high temperature conditions. Therefore, it is recommended that future specifications contemplate this thermal limitations regarding epoxy resin, since the inorganic resin coating presents composites. This indicates inorganic resin as the most adequate material to the function of matrix in composites of the naval construction, mainly in pipes of oil platforms where the high temperature can provoke serious accidents involving fire.