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P4.198 Iter sixth poloidal field coil insulation qualification

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The Poloidal Field (PF) coils are one of the main sub-systems of the ITER magnets. Fusion for energy (F4E) is responsible for supply five of them (PF2-PF6) as in-kind contributions to ITER project. ITER PF6 coil is being manufactured by the Institute of Plasma Physics, Chinese Academy of Sciences (ASIPP) as per the Poloidal Field coils cooperation agreement signed between ASIPP and F4E.

An insulation system for ITER poloidal field 6 (PF6) coil must have sufficiently high mechanical strength to sustain the enormous electromagnetics force during tokamak operation. We developed a glass fiber and polyimide interleaved insulation structure, optimized the vacuum pressure impregnation (VPI) curing method, and finally accomplished the insulation qualification items for ITER PF6. The mechanical performance of the insulation system, include the ultimate tensile strength (UTS), fatigue tensile strength, interlaminar shear strength (ILSS), was demonstrated by flat-plate laminated specimens, the insulation to stainless steel bonding performance was verified by the compression/shear strength at 45°. Now the static and fatigue UTS, ILSS, compression/shear strength and void content have been completed. This paper summaries the whole qualification process and the testing results for PF6 coil insulation.

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