Beryllium was chosen as the armor material for the Fist Wall and Port Limiter of ITER. As results of ITER EDA activities the reference beryllium grade S-65C (USA, Brush Wellman) and the DshG-200 grade (RF, Bochvar Institute) were selected as materials for armor of ITER FW. The main criterion of a choice of given grades was their highest resistance against High Heat Flux loading shown by results of thermal fatigue/shock test experiments carried out earlier in SNL (USA) and FZ Juelich (Germany). Recently in RF the new Be grade TGP-56FW has been proposed, which is a modified analogue of DshG-200 grade with improved properties, and also a low-waste manufacturing process for production of Be tiles for armor of ITER FW has been developed. In comparison with DshG-200 grade the main advantage of TGP-56FW grade consists in higher level of strength properties and plasticity as well as higher uniformity of physical-mechanical properties in transverse and longitudinal directions relatively pressing axis.

In this paper the results of RF R&D activities in production and characterization of TGP-56FW beryllium grade for FW armor are presented. The results of HHF tests (thermal fatigue/disruption simulation) on TSEFEY-M testing facility for full-scale beryllium tiles produced from TGP-56FW grade are also reported. A new in-pile integrated test experiment for Be mock-ups that combines thermal cycling ($2 \times 10^4$ cycles at 0.5 MW/m$^2$) and neutron irradiation (about 0.6 dpa) is discussed.