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## Wed-Mo-Po.09-06: Trial Fabrication Report on HTS Stacks-In-Conduit Conductors for Fusion Applications

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As compared with low-temperature superconducting (LTS) conductors where wires are typically fully transposed, simply stacked high-temperature superconducting (HTS) conductors may be argued as easier to be fabricated. However, brittleness of HTS tapes presents significant challenges for efficiently assembling them into HTS conductors. Once winding finished, it is preferable stacks are tightly bound together to reduce possible damage on coated layer. Here, we report on trial HTS conductor fabrication results, fabricated based on our previous design work. Basically, our HTS conductor designs consist of three parts, 1) bundle part, 2) stabilizer part with a spiral shape, and 3) stainless steel jacket. First, 30-layer stacks were co-wound on a 1.5 m diameter bobbin, where stacks can be wrapped by a 70  $\mu$ m thick copper tape if needed. Then the stacks are accumulated into 4x4 bundle and copper wrapped bundle was put into square cross-section thick copper spiral then into a jacket and squeezed. Non-wrapped bundle was covered with a copper sheet, pressed, capped with grooved copper formers, put into a jacket and compacted. Automated machines were developed for processes such as stacking, wrapping, cabling, capping, spring insertion, and jacketing. Detailed fabrication process, step-by-step fabrication results, and final conductor shape, cross-sectional views and especially manufacturing issues related to spring-back effect during roll forming process will be further discussed.

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**Author:** Dr OH, Sangjun (Korea institute of Fusion Energy)

**Co-authors:** BAEK, Geonwoo (Korea institute of Fusion Energy); Mr PARK, Won Woo (Korea institute of Fusion Energy); Ms CHOI, Heekyung (Korea institute of Fusion Energy); Mr KIM, Youngkyoung (Kiswire Advanced Technology); Mr SHIN, Iksang (Kiswire Advanced Technology); Mr JE, Sanghyeun (Kiswire Advanced Technology); Mr CHOI, Kyuhan (EnableFusion)

**Presenter:** Dr OH, Sangjun (Korea institute of Fusion Energy)

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