

Development of a high-capacity single-stage 20K GM cryocooler

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This poster discusses the development of a new single-stage 20K Gifford-McMahon (GM) cryocooler by Sumitomo Heavy Industries, Ltd. The new cryocooler will have been released in this April. Its main features and the potential applications will be highlighted.

The new cryocooler is an upgraded version of the existing RDK-500B model, with no changes to its interface. It can be used for High-Temperature Superconductivity (HTS) applications. In addition, use for liquid hydrogen (LH2) recondensation and its small amount generation could be other potential applications. One of the key improvements in the new cryocooler is its enhanced cooling capacity, particularly below 30K. The cooling capacity at 20K is improved by over 10% compared to the existing model. It has achieved a cooling capacity of over 50W at 20K when the compressor is operated at 60Hz. In addition to the improved cooling capacity, the lifetime of the cryocooler has also been enhanced compared to the existing model. This means that the new cryocooler can provide reliable and efficient cooling for longer durations.

This poster also highlights the potential applications of the new cryocooler briefly. It can be utilized in HTS applications, which require cryogenic temperatures for optimal performance. It is also expected that it can be used in hydrogen recondensation and small amount LH2 generation, which are crucial to store and to produce of LH2.

Overall, this poster presents the main features and advancements of the new single stage 20K GM cryocooler developed by Sumitomo Heavy Industries, Ltd. Its potential applications in HTS systems and in hydrogen recondensation and small amount generations will also be addressed.

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