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Dry Vent System without Bakeout for UHV

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ABSTRACT

The vacuum chamber for the Pohang Light Source (PLS) has been designed to accommodate in-situ bakeout at 100°C or higher temperature in order to achieve low 10^{-10} Torr. However, after such a high temperature bakeout, it takes a long time to align magnets and vacuum chambers. Therefore it usually requires 2~3 weeks to recover low 10^{-10} Torr after the vent of 1 cell vacuum chambers.

In order to reduce the repair term, we have designed and constructed a dry vent system for UHV without bakeout, and applied it to the storage ring vacuum chamber when we replace vacuum components. The dry vent system for UHV consists of LN₂ dewer, heating device, and cooling device of vent gas. We have performed vent at a very low gas temperature.

In the vent operations, chamber pressure before vent was 1×10^{-10} Torr while that after vent followed by 48-hour pump down was 3×10^{-10} Torr. The ultimate pressure of 1×10^{-10} Torr has been achieved after one week pump down.

Based on these results, the vent effect for UHV will be investigated by varying parameters, such as vent gas species, temperature and pressure.