

Long-Term High-Velocity Erosion of Glidcop in DI Water*

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Alumina dispersion-strengthened copper, known by the trade name of Glidcop, is used extensively for high-heat-load components of third-generation light sources. Unlike oxygen-free copper, Glidcop retains high mechanical strength at elevated temperatures and can be brazed without an appreciable loss of strength.

In high-heat-load applications the maximum temperature rise can be reduced by increasing water velocity in the cooling channels, which effectively increases the heat transfer film coefficient. However, increasing water velocity beyond a certain limit can result in unacceptable levels of erosion at the channel surfaces. Long-term tests are underway at the Advanced Photon Source (APS) to establish erosion rates for Glidcop for different deionized (DI) water velocities. This paper presents test results from 12 samples subjected to DI water velocities ranging from 1.5 m/s to 8.7 m/s for a period of two years.

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