APPLICATION GUIDELINES

FOR

CRYOSAVER CURRENT LEADS

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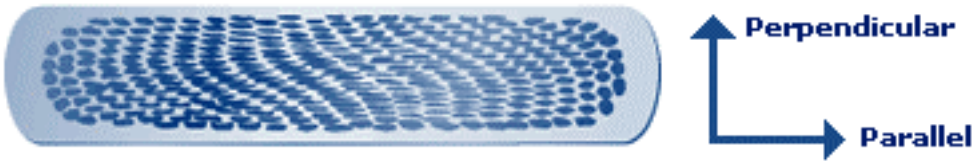
Prepared by HTS-110 Limited

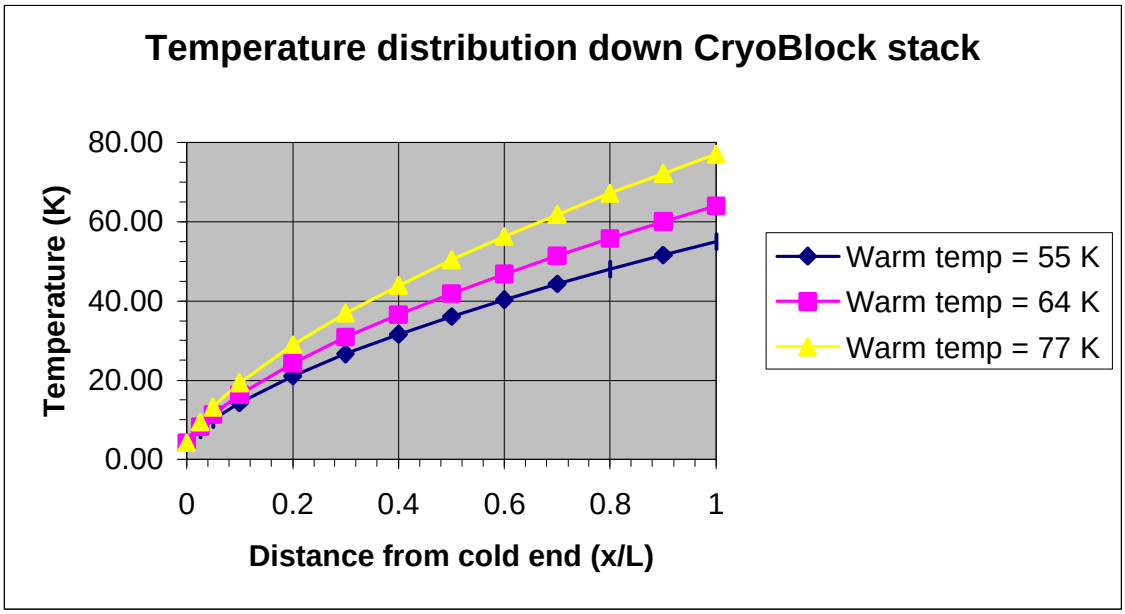
Application guidelines for CryoSaver current leads

CryoSaver current leads employ HTS tape which has anisotropic in-field performance. The current rating decreases much more severely for field oriented perpendicular to the plane of the tape than for field parallel to the plane (either along the long axis or across the width of the tape).



In the CryoSaver current leads, the HTS tape plane is oriented in the plane of the flats of the end caps, allowing the user to identify HTS tape orientation and optimize the lead installation. Where possible the lead should be oriented to minimize field perpendicular to the cap flat, particularly at the warm end of the lead.

The expected temperature distribution down the HTS wire stack for various warm-end temperatures is shown in the following graph. For the standard CryoSaver leads the stack length L can be taken as 198 mm and is centrally located in the lead (starting 54 mm in from each end); given their high thermal conductivity a constant temperature can be assumed for each of the 54 mm end caps.



The graphs on the following page show the current scaling factors (relative to the T=64 K zero-field rating) for 100 A leads at various temperatures for fields applied perpendicular and parallel to the connector flats. In combination with the temperature distribution down the lead given above, these graphs can be used to confirm safe operating conditions for the leads.

Note that these scaling factors are conservatively specified; please consult HTS-110 if there appears to be a difficulty in maintaining lead performance in your application.

Current scaling factors for magnetic field and temperature