Leaks of LN$_2$ and some gaseous N$_2$ were observed under certain conditions during a systems integration test at MIT prior to shipping the magnet to CERN. Attempts to mitigate the problem before shipping were not successful as similar behavior was also observed at CERN during the reception testing.

The problem has been diagnosed as consisting of radial fractures in several of the silicone rubber washers which had been used as sealant barriers around the 6 cylindrical electrical feedthroughs for the 3 internal coil packages within the magnet.

Consulting with cryo experts at BNL led us to consider an alternative sealant material known as Gore-Tex Joint Sealant which has particularly attractive compliant properties over a broad temperature range including room temperature and 80$^\circ$K.

Two test fixtures were prepared to allow an examination of the properties of Gore-Tex at both room temperature and 80$^\circ$K. A compression fixture permitted an examination of compliant properties at room temperature. In addition, a second fixture was prepared which gave us the capability to mimic more precisely the environment of the electrical leads penetrations at both room temperature and 80$^\circ$K.

A testing program was followed in which several packing solutions were tried. The favored solution showed acceptable sealant behavior at both room temperature and 80$^\circ$K. The tests consisted of measuring the leak rate of 10-bar gaseous He at both cryogenic and room temperatures. This exceeds the expected operating conditions of the solenoid which will experience brief periods of 5-bar gaseous N$_2$ in which the LN$_2$ will be purged from the magnet prior to it being energized.

Leak rates of $10^{-3}$ mbar-l/s were observed for the 10-bar He gas at cryogenic temperatures. This corresponds to a loss rate of 12 mg/day of He gas if it is held at this pressure continuously.

We consider this to be a promising result and are now working to implement this solution on the solenoid itself. A full test of the magnet will be conducted at cryogenic temperatures to confirm the sealant characteristics prior to insertion of the magnet into the TT2a tunnel.