

Test #1 - Determine HX freeze point:

We placed an aluminum container with about 2" of Hydromx on a block of dry ice which was placed in an insulated cooler. We placed an electronic thermometer in the Hydromx. The surface temperature of the container was -58°F (digital thermometer does not display temperatures lower than -58°F. The advertised temperature of dry ice is -109°F). The Hydromx became a thick slush at the point of contact around the container with about a ¼" build up. However, the remaining Hydromx remained liquid down to -28°F. It became slightly slushy at about -30°F. This test, though unscientific, is easy enough to perform. This temperature agrees, within a few degrees, with the data from Turkey, the UK and Dynalene, the testing laboratory in PA.

Test #2 – HX expansion verses water expansion:

We constructed two ¾" I.D. type "L" copper pipes of the exact same size, 8" long. We soft soldered a cap on one end, and a female adapter on the other so the pipes could be filled. We filled one pipe with water and one pipe with the 50/50 mixture of Hydromx and tightened a male pipe plug into the adapter to allow no room for expansion. We placed them on the block of dry ice. In 7 minutes the soldered cap on the pipe with water bulged out then split. The pipe with the Hydromx showed no signs of failure. We left the Hydromx pipe on the dry ice for over 3 hours with no splitting or distortion. We strapped the digital thermometer probe on each pipe and the temperature of the outer pipe wall in both cases was -58°F. The images below show both pipes.



Test #3 – Does HX become a “solid” at extreme low temperature?

We filled one 16oz. plastic bottle with water and one with 50/50 mixture of Hydromx. We left both on a block of dry ice overnight. The next morning the water was frozen solid, as you would expect. However, the bottle with the Hydromx was a slushy mixture and did not freeze solid. The bottle remained pliable. We estimate the total time each bottle was left on the dry ice was 18 hours.

Conclusion:

These tests convinced us that the point at which a 50/50 mixture of Hydromx begins to freeze is in the -28°F to -30°F range. We further concluded that there is virtually no expansion of Hydromx at extreme low temperatures. At this extremely low temperature Hydromx will not cause a failure of the pipe or equipment. Lastly, Hydromx did not become solid even at extreme low temperatures, -58°F and lower.