

Driscopipe[®] 8000 Pipe Degradation in High Temperature Applications

In March 2012, The Pipeline and Hazardous Safety Materials Administration (PHMSA) issued an advisory bulletin [ADB-2012-03](#) regarding the potential for Driscopipe[®] 8000 pipes to degrade in service. Figures 1 through 4 are examples of degraded Driscopipe[®] 8000 pipes.

Identifying Driscopipe[®] 8000 Pipes

Driscopipe[®] 8000 pipes were produced from late 1979 through 1997 by Phillips Products Company, a subsidiary of Phillips Chemical Company which was later called Phillips Driscopipe, Inc. In some areas of the country, sales continued for a few years after production stopped. The pipes were produced from Marlex[®] M-8000 compounded black resin produced by Phillips Chemical Company. In some cases utilities referred to the pipes as 'M8000 pipe' or '8000 pipe'.

Driscopipe[®] pipes were a solid black PE3408 pipes with burnished gloss surface and a yellow print line. The pipe was available in sizes from ¼" through 8" diameter.

Other Info

- (a) Driscopipe[®] Series 7000 and 8000 HDPE pipe exposed to prolonged elevated temperatures may degrade as a result of thermal oxidation. The mechanism for this oxidation appears to be the depletion of the thermal stabilizer which has been shown to occur over time in high ambient temperature conditions. Series 7000 and 8000 HDPE pipe that has undergone substantial thermal oxidation may, upon physical inspection, display blistering, delamination or peeling of the OD or ID surfaces.
- (b) Based on laboratory testing and observed field performance, the regions of the US that have the highest ambient temperature conditions are of particular concern. All of the reported occurrences of in-service degradation and degradation-induced leaks have related to Series 7000 and 8000 pipes installed in the desert region of the southwestern US; particularly the Mohave Desert region in Arizona, California and Nevada.
- (c) The potential for thermal oxidation of Series 7000 and 8000 HDPE pipe increases as pipe temperature and exposure time of the pipe to elevated temperature increase. At least the following factors are believed to increase pipe temperature:
 - Increased average and maximum ambient temperatures;
 - Conditions where this is low or no gas flow;
 - Increased gas temperature;
 - Soil type (i.e., diffusivity);
 - Decreased burial depth; and
 - Ground covers that hold heat, such as concrete and asphalt.
- (d) Each operator that has Driscopipe[®] Series 7000 and or 8000 pipe as part of their systems should implement the following practices as may be applicable:
 - (1) Operators of piping systems in moderate and cooler regions of the US should continue to monitor the performance of Series 7000 and 8000 HDPE pipe in their system and report any evidence of thermal degradation;

- (2) Operators of piping systems in warmer regions of the US should implement, in addition to system monitoring, further steps such as random sampling or sampling of specific areas in their system that may represent a higher risk for thermal degradation taking into account ambient conditions and the pipe temperature factors stated above and report any evidence of thermal degradation; and
 - (3) Operators of piping systems in high temperature regions, such as the desert southwest and southern most regions of the US should examine their systems and, where indicated, prepare and implement a program to inspect and sample a broad portion of their system upon due consideration of the ambient conditions and the pipe temperature factors stated above, and do so regularly; and report any evidence of thermal degradation.
- (e) Methods of evaluating samples for thermal oxidation include:
- a. Visual examination: affected pipe may display blistering, delamination or peeling of the OD or ID surfaces;
 - b. Bend-back test method per ASTM D2513: affected pipe is likely to show signs of cracking or crazing when subjected to a bend-back test; and
 - c. Oxidation induction time (OIT) test per ASTM D3895: An OIT value of 5 minutes or less is indicative of significant stabilizer depletion in the pipe and such values warrant further study.