

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

OPERATIONAL MEMO 115-19

April 26, 1999

TO: All Waste Management Division Supervisors

FROM: Jim Sygo, Chief, Waste Management Division

SUBJECT: Destructive Seam Testing Criteria for Smooth Sheet High Density Polyethylene (HDPE) Geomembranes

This Operational Memorandum specifies minimum destructive seam testing criteria for smooth sheet HDPE geomembranes. These minimum standards were developed by the Michigan Department of Environmental Quality, Waste Management Division (WMD) for use in overseeing the construction of solid waste landfills, but are equally applicable in the review of any project where the seaming of smooth sheet HDPE geomembrane is required.

Part 115, Solid Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451 as amended Rule 137, adopts by reference the flexible membrane liner specifications contained in the National Sanitation Foundation (NSF) document NSF 54-1991. The WMD has determined that field fabricated seams must, at a minimum, meet the same minimum requirements listed in NSF 54-1991 for factory fabricated seams. The following summarizes our minimum position relative to destructive seam testing of HDPE geomembranes:

1. A film tear bond (FTB) must be achieved for each test specimen whether in the shear or peel mode. The definition of FTB is described in NSF Standard 54-1991 with the following clarification to that document:

The FTB is required and must be achieved for five out of five test specimens in the shear test mode; the acceptance criteria for FTB is less than or equal to ten percent incursion as a percentage of total weld area.

The FTB is required and must be achieved for four out of five test specimens in the peel test mode; the acceptance criteria for FTB is less than or equal to ten percent incursion as a percentage of total weld area. The fifth test specimen must exhibit FTB less than or equal to 50 percent peel incursion.

2. The attached table summarizes WMD's minimum destructive seam testing criteria for HDPE geomembranes.

Attachment

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

HIGH DENSITY POLYETHYLENE DESTRUCTIVE SEAM TESTING

TEST	TESTING CRITERIA
<p>SHEAR</p> <p>? Follow test procedures as specified in ASTM D-4437</p>	<p>"Five-of-five" specimens must achieve:</p> <ol style="list-style-type: none"><li>1. 120 pounds per inch (ppi) minimum tensile strength at yield for 60-mil sheet, 160 ppi minimum tensile strength at yield for 80-mil sheet;<li>2. 100 percent of minimum yield strength specified in the project design; and<li>3. Film tear bond (FTB) with ten percent or less incursion as a percentage of total weld area.
<p>PEEL</p> <p>? Follow test procedures as specified in ASTM D-4437</p>	<p>"Four-of-five" specimens must achieve:</p> <ol style="list-style-type: none"><li>1. 88 ppi minimum tensile strength at yield for fusion welds of 60-mil sheet, 118 ppi minimum tensile strength at yield for fusion welds of 80-mil sheet;<li>2. 78 ppi minimum tensile strength at yield for extrusion welds of 60-mil sheet, 104 ppi minimum tensile strength at yield for extrusion welds of 80-mil sheet;<li>3. FTB with ten percent or less incursion as a percentage of total weld area;<li>4. The "fifth" specimen must achieve 90 percent of the above passing strength requirement, and FTB with 50 percent or less incursion as a percentage of total weld area.

* American Society of Testing Materials