1 April 2011

Committee F03 on Gaskets
Subcommittee F03.40 on Chemical Test Methods

Research Report F03-1018

Interlaboratory Study to Establish Precision Statements for ASTM F2837-11, Test Method for Hot Compression Properties of Gasket Materials

Technical contact:
James Lingenfelder,
Gasket Resources
12227C FM 529
Houston, TX 77041
US
jtling@durlon.com

ASTM International
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959

1. Introduction:

Interlaboratory Study 185 was conducted to establish a precision statement for F2837, Test Method for Hot Compression Properties of Gasket Materials.

2. Test Method:

The Test Method used for this ILS is F2837-11. To obtain a copy of F2837, go to ASTM's website, www.astm.org, or contact ASTM Customer Service by phone at 610-832-9585 (8:30 a.m. - 4:30 p.m. Eastern U.S. Standard Time, Monday through Friday) or by email at service@astm.org.

3. Participating Laboratories:

The following laboratories participated in this interlaboratory study

1. Amtec Services
   Hoher Steg 13
   D-74348 Lauffen
   DE
   Mr. Manfred Schaaf
   + 49 / 7133 / 9502 / 0
   ms@amtec-services.de

2. Amtec Services
   Hoher Steg 13
   D-74348 Lauffen
   DE
   Mr. Manfred Schaaf
   + 49 / 7133 / 9502 / 0
   ms@amtec-services.de

3. Amtec Services
   Hoher Steg 13
   D-74348 Lauffen
   DE
   Mr. Manfred Schaaf
   + 49 / 7133 / 9502 / 0
   ms@amtec-services.de

4. Amtec Services
   Hoher Steg 13
   D-74348 Lauffen
   DE
   Mr. Manfred Schaaf
   + 49 / 7133 / 9502 / 0
   ms@amtec-services.de

5. Durabla Canada Ltd
   Box 696, 293 University Ave
   Belleville, Ontario
   CA
   Mr. Noel Migneault
   613-966-1442
   nmigneault@durabla.ca

6. Garlock Inc.
   1666 Division St.
   Palmyra, NY
   US
   Mr. Dave Burgess
   315-597-3386
   dave.burgess@garlock.com

7. W.L. Gore & Associates
   201 Airport Rd.
   Elkton, MD 21922-4135
   US
   Mr. Kevin Dove
   410-506-7521
   kdove@wlgore.com

8. Hollingsworth & Vose
   112 Washington Street
   East Walpole, MA 02032
   US
   Mr. Doug Guimond
   508-668-0295
   dguimond@hovo.com

9. Thermoseal Inc.
2350 Campbell Road
Sidney, OH 45365
US
Ms. Nancy Burkhart
937-498-2222
nburkhart@thermosealinc.com

4. Description of Samples:

There were 1 samples of varying targeted results used for this study. Each sample was prepared and distributed by [Nancy] [Burkhart] of [Thermoseal Inc]. Below is a list of the samples with the corresponding supplier:

1. Sheet-Type Gasketing (see Classification F 104), 1.5 mm (1/16") thick, specimen size is 90 mm (3.55 in.) outside diameter by 50 mm (1.97 in.) inside diameter.
Provided by Thermoseal Inc.

5. Interlaboratory Study Instructions

Laboratory participants were emailed the test program instructions. For a copy of the instructions, please see Annex A.

6. Description of Equipment/Apparatus[1]:

For information on the equipment/apparatus used by each laboratory, please see Annex B.

7. Data Report Forms:

Each laboratory was provided with a data report form for the collection of data. A copy of the data is provided in Annex C.

Please note: The laboratories have been randomly coded and cannot be identified herein.

8. Statistical Data Summary:

A summary of the statistics calculated from the data returned by the participating laboratories is provided in Annex D.

9. Precision and Bias Statement:

9.1 The precision of this test method is based on an intralaboratory study of WK20177, Proposed Standard Test Method for Hot Compression Properties of Gasket Materials, conducted in 2008. Nine laboratories tested a single type of gasketing material. Every

[1] The equipment listed was used to develop a precision statement for [F2837-10]. This listing is not an endorsement or certification by ASTM International.

"test result" represents an individual determination. Each laboratory was asked to submit triplicate test results, from a single operator, for the material. Except for the analysis of only a single material, Practice E 691 was followed for the design and analysis of the data; the details are given in ASTM Research Report No. F03-1018.

9.1.1 *Repeatability limit (r)* - Two test results obtained within one laboratory shall be judged not equivalent if they differ by more than the "*r*" value for that material; "*r*" is the interval representing the critical difference between two test results for the same material, obtained by the same operator using the same equipment on the same day in the same laboratory.

9.1.1.1 Repeatability limits are listed in Tables 1 – 4 below.

9.1.2 The above terms (repeatability limit and reproducibility limit) are used as specified in Practice E 177.

9.1.3 Any judgment in accordance with statement 9.1.1 and would have an approximate 95% probability of being correct.

Table 1. Thickness decrease – hot (%)

Material	Average [1]	Repeatability Standard Deviation	Repeatability Limit
	$\bar{x}$	s_r	r
A	4.53	0.42	1.18

Table 2. Thickness decrease – cold (%)

Material	Average [1]	Repeatability Standard Deviation	Repeatability Limit
	$\bar{x}$	s_r	r
A	7.32	0.67	1.87

Table 3. Thickness decrease – total (%)

Material	Average [1]	Repeatability Standard Deviation	Repeatability Limit
	$\bar{x}$	s_r	r