Intertek | Architectural Testing

PERFORMANCE TEST REPORT

Rendered to:

DOW CHEMICAL COMPANY

PRODUCT: DOWSIL™ 795 Silicone Building Sealant

Report No.:	**F9469.01-106-31**
Report Date:	**02/10/17**
Test Record Retention Date:	**01/27/21**
Revision 1:	**12/04/17**

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PERFORMANCE TEST REPORT

Rendered to:
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Report No.:	F9649.01-106-31
Test Start Date:	06/02/16
Test Completion Date:	01/27/17
Report Date:	02/10/17
Test Record Retention Date:	01/27/21
Revision 1:	12/04/17

Product: DOWSIL™ 795 Silicone Building Sealant

Project Summary: Architectural Testing, Inc., an Intertek company ("Intertek-ATI"), was contracted by Dow Chemical Company to evaluate the DOWSIL™ 795 Silicone Building Sealant in accordance with ASTM C1184. The product description, test procedures, and test results are reported herein. Average test results are reported in the table below.

Test	Requirement	Result
ASTM C639 - Rheological Flow	≤3/16 in.	0 in.
ASTM C603 - Extrudibility	≤10 seconds	3.33 seconds
ASTM C661 - Hardness	20-60	40
ASTM C792 - Heat Aging	≤10% weight loss	1.897%
ASTM C679 - Tack Free Time	≤3 hours (180 minutes)	140 minutes
ASTM C1135 - Tensile Adhesion - Standard Conditions	50 psi	83 psi
ASTM C1135 - Tensile Adhesion - 88ºC (190ºF)	50 psi	70 psi
ASTM C1135 - Tensile Adhesion - -29ºC (-20ºF)	50 psi	117 psi
ASTM C1135 - Tensile Adhesion - Water Immersion	50 psi	87 psi
ASTM C1135 - Tensile Adhesion - 5,000 hours QUV Weathering	50 psi	78 psi

Test Methods: The test specimens were evaluated in accordance with the following methods.

ASTM C1184-14, *Standard Specification for Structural Silicone Sealants*

ASTM C639-15, *Standard Test Method for Rheological (Flow) Properties of Elastomeric Sealants*

ASTM C603-14, *Standard Test Method for Extrusion Rate and Application Life of Elastomeric Sealants*

ASTM C661-15, *Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer*

ASTM C792-15, *Standard Test Method for Effects of Heat Aging on Weight Loss, Cracking, and Chalking of Elastomeric Sealants*

ASTM C679-15, *Standard Test Method for Tack-Free Time of Elastomeric Sealants*

ASTM C1135-15, *Standard Test Method for Determining Tensile Adhesion Properties of Structural Sealants*

Product Description: The DOWSIL™ 795 Silicone Building Sealant was purchased by Intertek-ATI and consisted of twelve tubes of sealant. The material was tested as-received.

Test Procedures and Test Results: The testing procedures and results obtained from testing are reported as follows. All conditioning of test specimens and test conditions were at standard laboratory conditions unless otherwise reported.

ASTM C639 - Rheological Flow

The sealant was determined to be Type II based on the guidelines of ASTM C639. Two stainless steel channels for were filled for a vertical slump test. One channel was placed vertically in a forced draft oven (ICN: Y002568) maintained at 50 ±2ºC (122 ±3.6ºF) while the other channel was placed into a refrigerator (ICN: Y002766) maintained at 4.4 ±2ºC (40 ±3.6ºF) for a period of 16 hours. Specimens were removed from their conditioning chambers and observed for any flow on the lower edge.

Specimen	Flow (in)
4.4 ±2ºC (40 ±3.6ºF)	0
50 ±2ºC (122 ±3.6ºF)	0

Test Procedures and Test Results: (Continued)

ASTM C603 - Extrudibility

The sealed tubes of the sealant were conditioned for at least 16 hours before testing began. One tube was selected at random and was used to fill a 177mL (6 fl oz) cartridge which was used for testing. The cartridge was placed into an air powered sealant gun which expelled the sealant with 50 psi of pressure out of the end of the cartridge with no nozzle.

Extrudibility Time
3.33 seconds

ASTM C661 - Hardness

Two specimens were prepared by filling a brass frame of internal dimensions measuring 5 in. X 1-1/2 in. X 1/4 in. The frame was removed and the sealant was allowed to cure under standard laboratory conditions of 73 ±4°F and 50% ±10% relative humidity for a period of seven days, followed by seven days at 100ºF and 95% relative humidity, and then seven days at standard laboratory conditions. A Shore "A" durometer (ICN: Y000092) was applied to the surface of each sealant pad with a force of three pounds. The instantaneous hardness reading was measured and recorded. Two additional readings were taken of each sealant pad for a total of six readings.

Reading	Specimen 1	Specimen 2
1	39	39
2	43	40
3	42	39
Average	**40**	

Test Procedures and Test Results: (Continued)

ASTM C792 - Heat Aging

Three specimens were prepared by filling a brass frame of internal dimensions measuring 5 in. X 1-1/2 in. X 1/4 in. on top of nominally 2 in. wide by 6 in. long aluminum plates. Before preparing specimens, the aluminum plate was weighed on a Mettler Toledo Balance (ICN: 65215). The plate and the fresh sealant were weighed using the same balance immediately after removing the brass frame. Specimens were allowed to cure for 7 days at standard laboratory conditions. Following the cure period Specimens 1 and 2 were placed into a forced-draft oven (ICN: Y002567) maintained at 70 ±2ºC (158 ±3.6ºF) for 21 days while the Specimen 3 was maintained at laboratory conditions. Specimens were allowed to cool to standard conditions and the re-weighed again to determine a percentage of mass loss.

Specimen No.	Weight of Aluminum Plate (g)	Weight of Aluminum Plate with Fresh Sealant (g)	Weight of Aluminum Plate with Aged Sealant (g)	Weight Loss (%)
1	21.543	62.764	61.980	1.902
2	21.805	63.117	62.317	1.936
3	21.825	60.500	59.784	1.851
Average	**21.724**	**62.127**	**61.360**	**1.897**

ASTM C679 - Tack Free Time

One tube of sealant was conditioned at standard laboratory conditions for at least 24 hours. Pads of sealant were made by filling a copper frame of internal dimensions measuring 5 in. X 1-1/2 in. X 1/8 in. Upon completion of the first sealant pad a timer was started and a reading was taken using polyethylene sheeting and a 30g weight with dimensions 1-5/8 in. X 3/4 in. every minute for the first 10 minutes followed by every 2 minutes for the next ten minutes and every 5 minutes for the next 160 minutes. The polyethylene strip was then peeled away from the sealant at a 90º angle. If sealant adhered to the strip the test was continued.

Tack-Free Time
140 minutes

Test Procedures and Test Results: (Continued)

ASTM C1135 - Tensile Adhesion

Twenty-five specimens were made for testing. A 3/8 in. wide spacer was used between two pieces of cleaned glass and clamped in place before sealant was used to fill the gap. After filling all molds the specimens were allowed to cure for 21 days at standard laboratory conditions before groups of five specimens were then subjected to one of the following conditions immediately prior to testing:

- Ambient
- 1 hour at -29°C
- 1 hour at 88°C
- 7 days of immersion in deionized water
- 5,000 hours of UV light exposure

After each exposure condition the samples were mounted to an Instron Universal Test Machine (ICN: 005740) and pulled in tension with a crosshead movement speed of 0.5 in/min until failure occurred.

Ambient Condition

Specimen No.	Area (in^2)	Load at 10% Elongation (lb_f)	Load at 25% Elongation (lb_f)	Load at 50% Elongation (lb_f)	Load at 100% Elongation (lb_f)	Peak Load (lb_f)	Tensile Strength (psi)	Cohesive Failure (%)
1	1.0	37.1	56.6	75.2	88.8	89.3	90	10
2	1.1	37.5	58.3	76.1	79.5	80.0	75	10
3	1.0	36.3	54.8	73.9	89.9	90.4	87	10
4	1.1	37.4	56.0	74.6	84.5	86.6	81	10
5	1.0	36.8	56.1	74.3	84.3	84.3	83	25
Average	**1.0**	**37.0**	**56.4**	**74.8**	**85.4**	**86.1**	**83**	

1 hour at 88ºC Condition

Specimen No.	Area (in^2)	Load at 10% Elongation (lb_f)	Load at 25% Elongation (lb_f)	Load at 50% Elongation (lb_f)	Load at 100% Elongation (lb_f)	Peak Load (lb_f)	Tensile Strength (psi)	Cohesive Failure (%)
1	1.0	30.3	44.9	60.7	68.1	69.3	71	10
2	1.0	27.7	44.0	60.3	65.4	68.3	68	50
3	1.0	27.3	42.4	54.5	54.6	58.0	58	100
4	1.0	30.2	45.7	61.3	78.3	78.3	81	10
5	1.0	31.0	47.3	63.3	72.4	75.0	73	10
Average	**1.0**	**29.3**	**44.9**	**60.0**	**67.8**	**69.8**	**70**	

Test Procedures and Test Results: (Continued)

ASTM C1135 - Tensile Adhesion
(Continued)

1 hour at -29ºC Condition

Specimen No.	Area (in^2)	Load at 10% Elongation (lb_f)	Load at 25% Elongation (lb_f)	Load at 50% Elongation (lb_f)	Load at 100% Elongation (lb_f)	Peak Load (lb_f)	Tensile Strength (psi)	Cohesive Failure (%)
1	1.0	56.7	86.1	117.2	131.2	131.2	125	25
2	1.0	55.6	81.2	109.3	102.6	115.3	110	50
3	1.0	53.3	81.0	109.9	109.7	116.5	115	50
4	1.0	53.1	78.6	107.9	117.9	119.6	124	25
5	1.0	45.7	70.5	97.0	98.7	105.8	109	50
Average	**1.0**	**52.9**	**79.5**	**108.3**	**112.0**	**117.7**	**117**	

7 days Deionized Water Immersion Condition

Specimen No.	Area (in^2)	Load at 10% Elongation (lb_f)	Load at 25% Elongation (lb_f)	Load at 50% Elongation (lb_f)	Load at 100% Elongation (lb_f)	Peak Load (lb_f)	Tensile Strength (psi)	Cohesive Failure (%)
1	1.0	35.2	52.6	71.4	90.5	94.5	97	10
2	1.1	39.0	57.0	77.6	97.4	101.4	93	10
3	1.1	39.0	55.9	75.5	90.4	91.3	86	10
4	1.0	34.3	52.5	71.7	79.7	81.9	79	10
5	1.0	33.9	49.6	67.2	82.2	82.3	80	10
Average	**1.0**	**36.3**	**53.5**	**72.7**	**88.0**	**90.3**	**87**	

5,000 Hour QUV Condition

Specimen No.	Area (in^2)	Load at 10% Elongation (lb_f)	Load at 25% Elongation (lb_f)	Load at 50% Elongation (lb_f)	Load at 100% Elongation (lb_f)	Peak Load (lb_f)	Tensile Strength (psi)	Cohesive Failure (%)
1	1.0	32.3	54.4	75.7	39.6	78.6	80	50
2	1.0	35.5	56.4	77.5	19.7	85.6	84	25
3	1.0	38.4	58.0	79.5	--*	84.7	87	50
4	1.1	30.6	52.3	61.2	45.0	68.0	62	50
5	1.2	42.3	64.6	86.4	--*	88.9	77	25
Average	**1.1**	**35.8**	**57.1**	**76.1**	**34.8**	**81.2**	**78**	

**Specimens did not stretch to 100% elongation.*

Intertek-ATI will service this report for the entire test record retention period. Test records that are retained such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Intertek-ATI for the entire test record retention period.

Results obtained are tested values and were secured using the designated test methods. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimen(s) tested. This report may not be reproduced, except in full, without the written approval of Intertek-ATI.

For INTERTEK-ATI:

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Attachments (pages) This report is complete only when all attachments listed are included.
Appendix A - Photographs (3)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
0	02/10/17	N/A	Original report issue
1	12/04/17	Throughout	Changed client name from Dow Corning Corporation to Dow Chemical Company

APPENDIX A

Photographs

Photo No. 1
Typical Rheological Flow Test Specimen

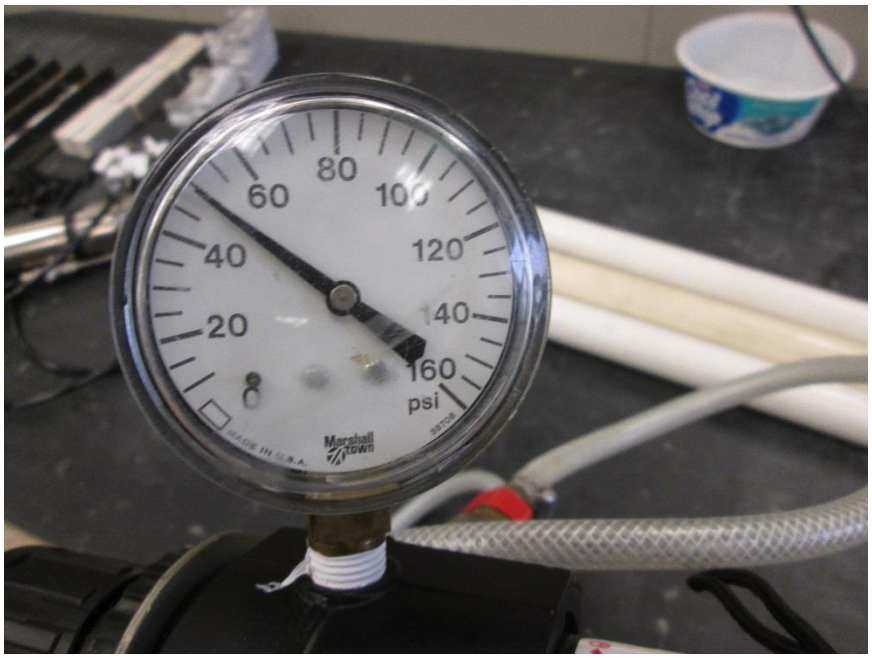

Photo No. 2
Extrudibility Pressure Detail

Photo No. 3
Extrudibility Test Complete

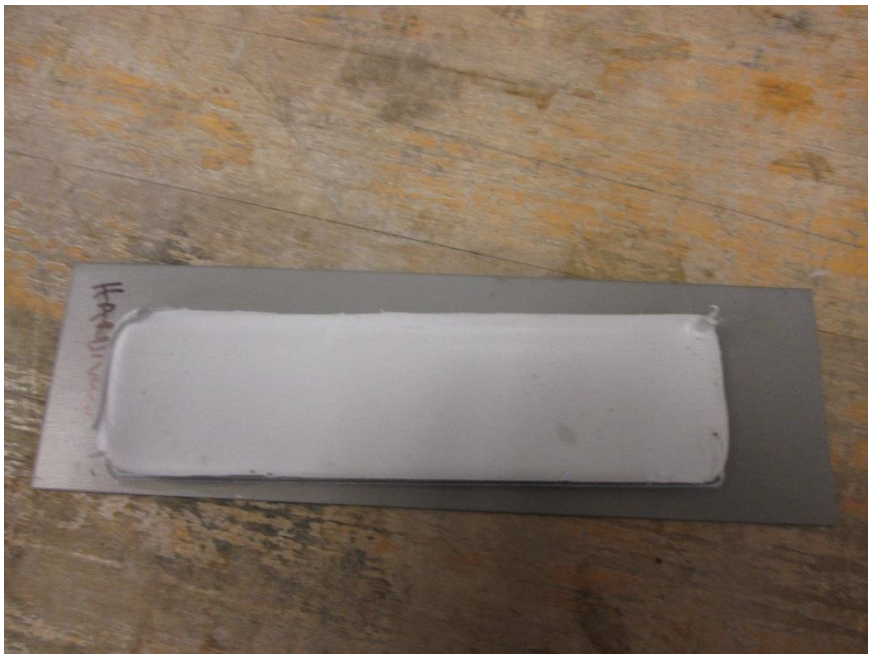

Photo No. 4
Hardness Test Specimen

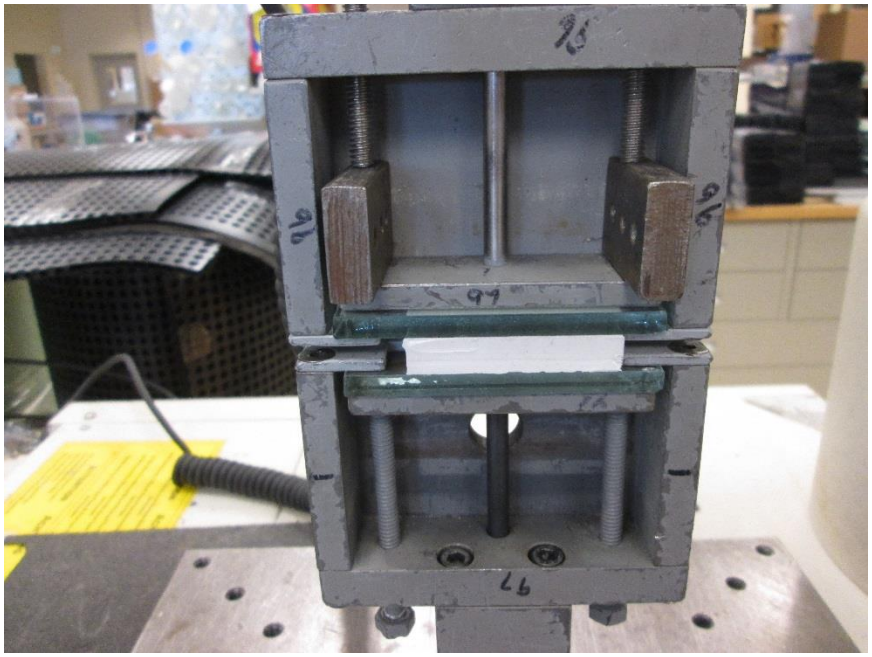

Photo No. 5
Tensile Adhesion - Test Set-Up

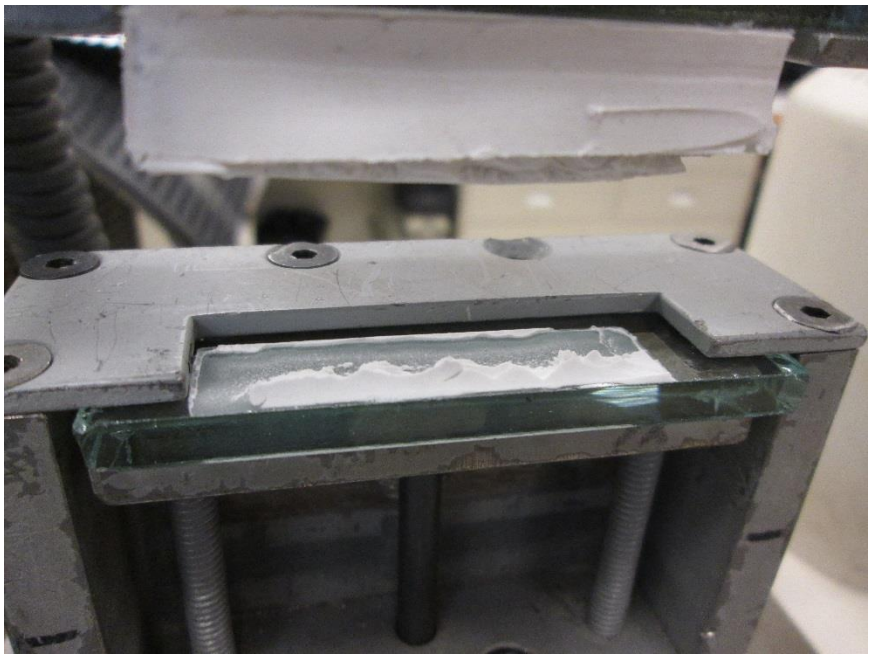

Photo No. 6
Tensile Adhesion - Failure Detail