



TEST REPORT

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Report Number: 1554-15003

Report Issued: June 24, 2015

Project No.: 24772

Client: Green Drain, Inc.
335 North Puente Street # F
Brea, CA 92821

Contact: Ben Wilson

Source of Samples: The samples were shipped to IAPMO R&T Lab from Green Drain, Inc., and received in good condition on April 02, 2015, and May 18, 2015.

Date of Testing: May 18, 2015 to June 23, 2015.

Sample Description: Trap Seal Devices
Models: *GD-102 (2")
GD-103 (3")
GD-103-5 (3.5")
*GD-104 (4")

“*” = tested samples.

Scope of Testing: The purpose of the testing was to determine whether the samples of the Trap Seal Devices met the applicable requirements of ASSE Standard # 1072-2007, “Barrier Type Floor Drain Trap Seal Protection Devices”.

Conclusion: **The samples tested of the Trap Seal Devices from Green Drain, Inc., models as shown above, complied with the applicable requirements of ASSE 1072-2007.**

By our signatures below, we certify that all the testing and sample preparation for this report was performed under continuous, direct supervision of IAPMO R&T Lab, unless otherwise stated.

Tested By,

Reviewed by,

Frank Lopez, Test Technician

Sean Vuu, P.E., Specialty Projects Manager

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Primary Standards: ASSE Standard # 1072-2007 / Section tested:

1. General
2. Test Specimens
3. Performance Requirements and Compliance Testing
4. Detailed Requirements

Test Results: All tests and evaluations were conducted per the written procedures specified in the ASSE Standard # 1072-2007.

ASSE Standard # 1072-2007:

1.2 Scope:

1.2.1 Description – FOLLOWED

The devices consisted of a membrane that allowed the flow of drainage to enter the plumbing drainage system. The devices closed when there was no flow.

1.2.2 Size – COMPLIED

The devices were sized according to the outlet sizes of the floor drains (2”, 3”, 3.5” and 4”).

1.2.3 Flow Capacity – COMPLIED

The devices permitted the flows of drainage as stipulated in Table 1 of this standard (refer to section 3.1).

1.2.4 Rating – FOLLOWED

The devices were rated for the type of floor or floor finish in which the floor drain can be installed “AF-GW”.

1.3 Construction – COMPLIED

1.3.1 Function: the devices opened when there is a maximum of 4 oz of water on the inlet to the device, and closed when there was no flow of wastewater into the devices (refer to section 3.4).

1.3.2 Evaporation: the devices passed the evaporation test described in Section 3.2 of this standard.

1.3.3 Obstruction of Flow: to prevent the collection of waste solids, the opening passageways in the device did not have any sharp edges or protrusions which would obstruct the flow to the drainage system or result in stoppages. The devices did not obstruct access to the interior of the floor drain trap.

1.3.4 Connections Within Floor Drain: the device connected within a floor drain that conformed to ANSI/ASME A112.6.3.

2.0 Test Specimens:

2.1 Sample Submitted – FOLLOWED

6 devices of each size and model were submitted by the manufacturer.

2.2 Samples Tested – FOLLOWED

1 sample was selected to be tested in order to sections 3.1 through 3.7 and additional 1 sample was selected to be tested to section 3.2, and another 1 sample was selected to be tested to section 3.8 of this standard.

2.3 Drawings – FOLLOWED

Assembly drawings, installation drawings, and other data which were necessary to enable the testing agency to determine compliance with this standard were accompanied assemblies when submitted for examination and performance testing under this standard.

2.4 Rejections – FOLLOWED

Failure of 1 device being tested shall be cause for rejection of that type or model and size.

3.0 Performance Requirements and Compliance Testing

3.1 Flow Test – COMPLIED

When tested to section 3.1.2 of this standard, the trap seals were able to flow at 12 gpm (2") and 73 gpm (4") for 10 minutes without overflowing the open sides of the pans.

3.2 Evaporation Test – COMPLIED

When tested to section 3.2.2 of this standard for 96 hours at 100°F, 20% relative humidity, the weight loss in cylinder A: 70.41g (2"), 269.9g (4"), cylinder B: 2.64g (2"; 3.75% of cylinder A), 7.8g (4"; 2.89% of cylinder A), cylinder C: 1.47 g (2"), 3.3g (4").

3.3 Trap Seal Interference Test – COMPLIED

When tested to section 3.3.2 of this standard, there was no protrusion of the device into the floor drain trap seal.

3.4 Opening Test – COMPLIED

When tested to section 3.4.2 of this standard, the devices started to open at: 1.31g (2"), and 2.2g (4").

3.5 Dirt and Debris Test – COMPLIED

When tested to section 3.5.2 of this standard, and subjected to section 3.2 for 96 hours, the weight loss in cylinder A: 75.42g (2"), 253.3g (4"), cylinder B: 2.53g (2"; 3.35% of cylinder A), 8.4g (4"; 3.32% of cylinder A), cylinder C: 1.44g (2"), 3.0g (4").

3.6 Floor Wax Test – COMPLIED

When tested to section 3.6.2 of this standard at 1 GPM, the devices did not overflow the floor drain top grates.

3.7 Grease Test – COMPLIED

When tested to section 3.7.2 of this standard at 1 GPM, the devices did not overflow the floor drain top grates.

3.8 Life Cycle Test – COMPLIED

After tested to section 3.8.2 of this standard, and subjected to section 3.2 for 96 hours, the weight loss in cylinder A: 77.59g (2”), 290g (4”), cylinder B: 3.2g (2”); 4.12% of cylinder A), 9.7g (4”); 3.34% of cylinder A), cylinder C: 1.73 g (2”), 4.2g (4”).

3.9 Physical Test of Membrane Material – COMPLIED (refer to CRT report no.: 19741-S1).

4.1 Materials - COMPLIED

4.1.1 Dissimilar Metals – NOT APPLICABLE (no metal).

4.1.2 Internal Metallic Parts – NOT APPLICABLE (no metal).

4.1.3 Non-metallic Parts - COMPLIED

Nonmetallic part (rubber & plastic) was designed for the rated operating temperature of the device without change in physical characteristics that would prevent full compliance with all requirements of this standard.

4.2.1 Marking of Devices – COMPLIED

Each device had the following information marked (molded), which is visible:

- a) Trademark “GREEN DRAIN” (per drawings).
- b) Application designation “AF-GW”.

4.2.2 Packaging - COMPLIED

Each device had the following information marked (printed) on the packaging:

- a) Manufacturer’s name “The Green Drain”
- b) Model number
- c) Rating for type of floor “AF-GW”
- d) Floor drain size.

4.3 Installation Instruction - COMPLIED

Instruction for installation of the device “press to install in drain outlet” was printed on the package.





CRT LABORATORIES, INC.

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TEST REPORT

PAGE 1 OF 2

FOR: IAPMO R & T Lab
5001 E. Philadelphia Street
Ontario, CA 91761
Tel: (909) 472-4143 / Fax: (909) 472-4195
ATTN: Mr. Sean B. Vuu

LWR NO.: 19741-S1 DATE: June 22, 2015

BACKGROUND:

The client submitted one (1) membrane material for testing to ASSE 1072-07 (Table 3). The sample arrived on 05/21/2015 via customer-supplied courier. Visual inspection was performed on 05/21/2015 and no product defects were noted. Testing in accordance with customer-supplied P.O. # 7339 received on 04/02/2015. The following additional information is provided:

CRT order entry log date: 05/21/2015 / **Report due date:** 06/22/2015

Sample ID: Membrane material (silicone) IAPMO Project # 24772

PREPARATION:

Set-up, machining & die punching – CRT methods / ASTM methods
Chemical set-up & preparation – ASSE 1072-07 / CRT methods
Conditioning – ASTM D 618-13, 40 hours in a standard laboratory environment

SPECIFICATION:

ASSE 1072-07(2013) Barrier Type Floor Drain Trap Seal Protection Devices (Section 3.9 / Table-3 Physical Test of Membrane Material):

TEST PROCEDURES:

Ozone resistance – ASTM D 1149-07, ASTM D 518 (method-B) at 104°F (±2°F) for 100h at 150pphm
Water absorption – ASTM D 471-98 for 48 h 158°F (±2°F)
Chemical Reagents – ASTM D 543-06 (72h at 74 ± 3.6°F)
Weather-o-meter (500h) – ASTM G 154-12a (4h Q.U.V. @ 60°C / 4h Condensation @ 50°C), U.V.B. 313 Bulbs
Tensile strength & Elongation – ASTM D 412-06a (Dumb-bell-C)
Split Tear strength – ASTM D 624-00 (Die-C)
Non-brittle Brittleness – ASTM D 2137-11 (3 minutes at -40°F (±2°F))

TEST RESULTS:


The results of testing are shown in the attached data table.

CONCLUSION:

Based on the results obtained, this sample meets the minimum requirements for section 3.9 as described in ASSE 1072-07 (Table-3)...**Complies**

Specimen Retain Bin: BB (30 day hold only unless otherwise specified)

CRT LABORATORIES, INC.

IAPMO R&T  ISO 9001:2008 Certified – Registered / ISO-IEC 17025:2005 Accredited

Ken A. Le Jeune
CEO / Laboratory Director

Raul Gonzalez
Laboratory Technician



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PAGE 2 OF 2

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ATTN: Mr. Sean B. Vuu

LWR NO: 19741-S1 DATE: June 22, 2015

TABLE 1

SAMPLE ID: Membrane material (silicone)

TESTING: Conformance to ASSE 1072-07 (Physical Test of Membrane Material)

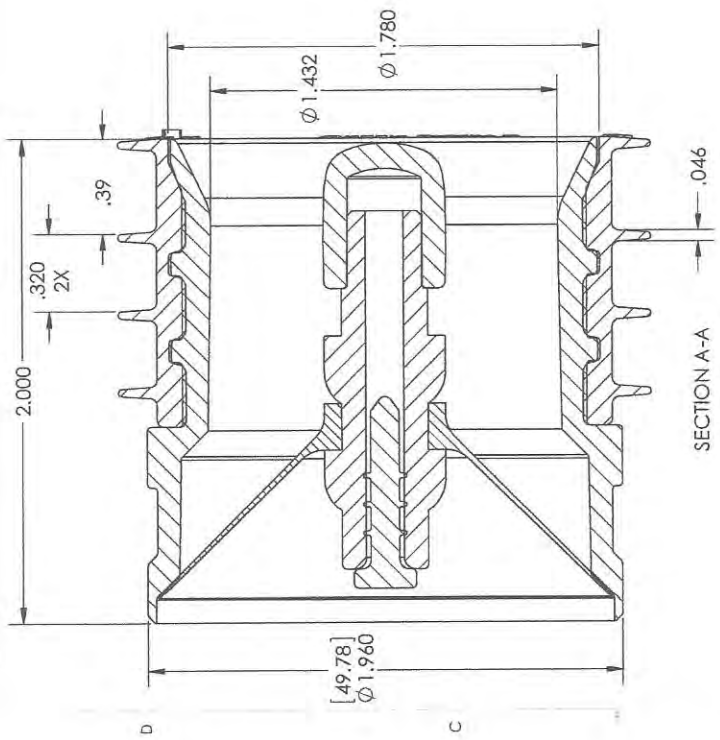
IAPMO project #: 24772

RESULTS FROM TABLE-3 REQUIREMENTS

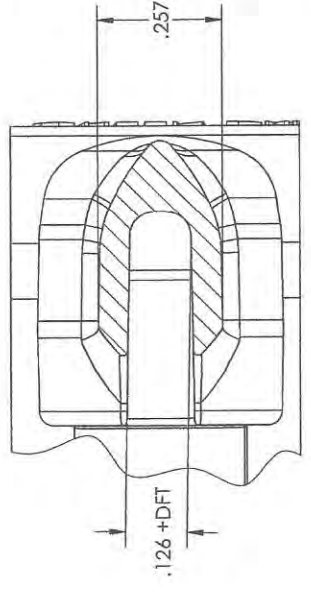
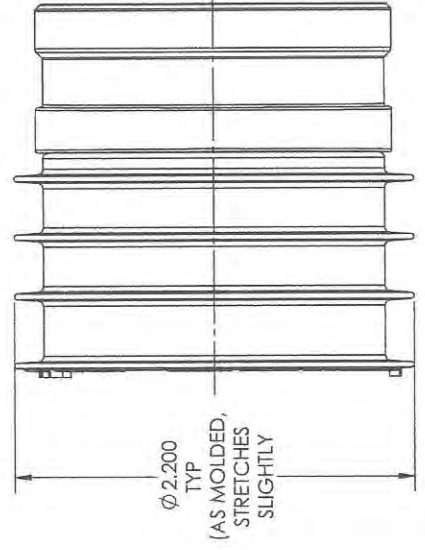
ASTM Method	Determination	Test values	Requirements
D 1149-07	(Method-B) Ozone resistance (visual) 150pphm / 40°C / 100h	No cracking or crazing / Pass	No cracking and/or crazing
D 471-06	Water absorption (%)	+ 0.36% / Pass	+ 20%, maximum
D 543-06	Chemical resistance (%) Sulfuric acid 1% (72h @ 23°C)	+ 0.17% / Pass	10%, maximum
D 543-06	Chemical resistance (%) Sodium hydroxide 1% (72h @ 23°C)	+ 0.21% / Pass	10%, maximum
G 154-12a	UV Resistance	Specimens were exposed for 500 h using UVB 313 lamps	
D 412-06a	Initial Tensile strength (Psi)	853	N/A
D 412-06a	Initial Elongation (%)	656	N/A
D 412-06a	Change in Tensile strength (Psi)	(726) -17.49% / Pass	-50%, maximum
D 412-06a	Change in elongation (%)	(552) -15.85% / Pass	-50%, maximum
D 624-00	Split Tear strength at 23°C (kn/m)	23.38 / Pass	0.25 kn/m, minimum
D 2137-11	Brittleness @ -40°C	No brittleness / Pass	No brittleness

...Complies

1 2 3 4 5 6 7 8



SECTION A-A



SECTION B-B
SCALE 4:1

UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN MILLIMETERS		RANDON	10/MAY/2015
TOLERANCES:		DRAWN	
FRACTIONAL:		CHECKED	
ANGULAR: MACH ±		ENG APPR.	
TWO PLACE DECIMAL ±		MFG APPR.	
THREE PLACE DECIMAL ±		Q.A.	
INTERPRET GEOMETRIC TOLERANCING PER:		COMMENTS:	
MATERIAL			
FINISH			
USED ON			
APPLICATION			
NEXT ASSY			
DO NOT SCALE DRAWING			

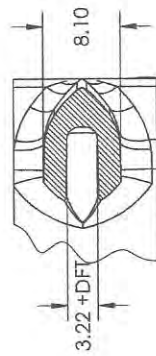
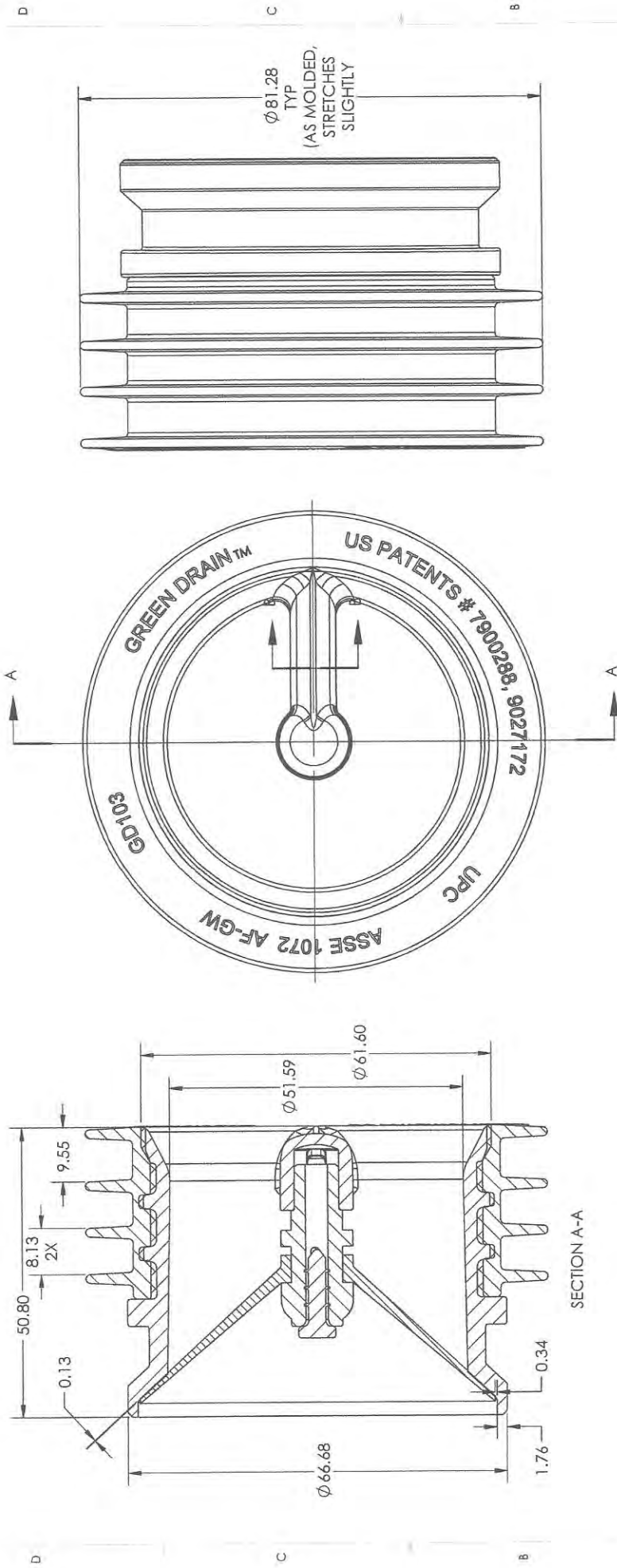
TITLE: FLOOR DRAIN, 2"
GD-102

SIZE DWG. NO. **B** REV **2**
SCALE: 1.5:1 WEIGHT: TBD SHEET 1 OF 1

FD-102_Floor_Drain_2

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1 2 3 4 5 6 7 8



SECTION B-B
SCALE 2:1

UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN MILLIMETERS	DRAWN	RANDON	10/MAY/2015
FRACTIONAL	CHECKED		
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TWO PLACE DECIMAL ±	MFG APPR.		
THREE PLACE DECIMAL ±	Q.A.		
INTERPRET GEOMETRIC TOLERANCING PER:	COMMENTS:		
MATERIAL	NOTED		
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APPLICATION	DO NOT SCALE DRAWING		

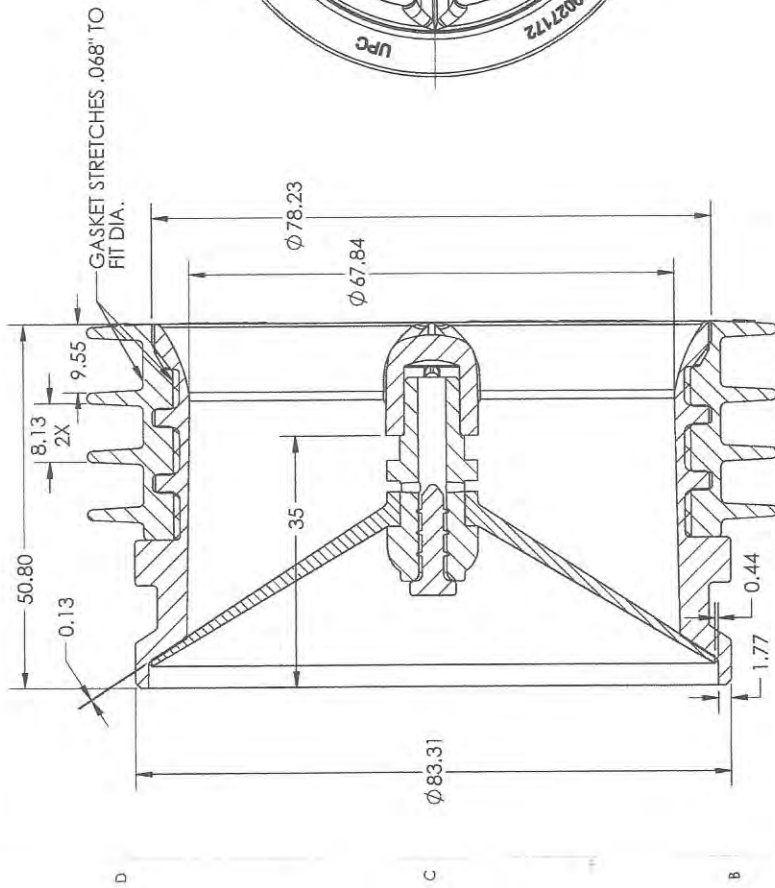
TITLE: GREEN DRAIN, 3"
GD-103

SIZE DWG. NO. B

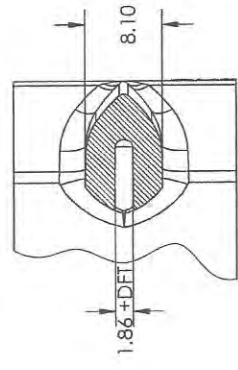
REV 2

SCALE: 3:2 WEIGHT: SHEET 1 OF 1

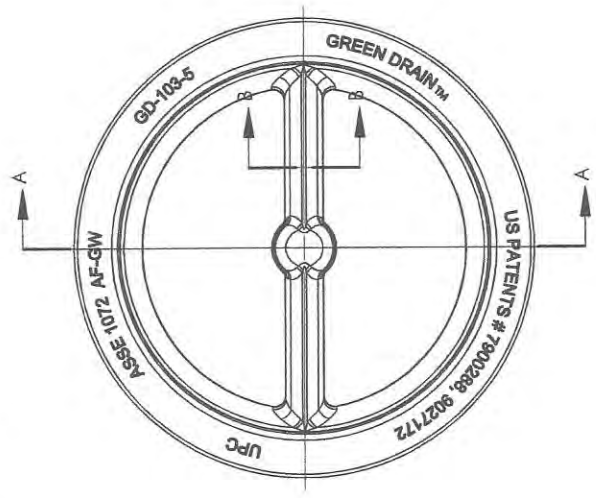
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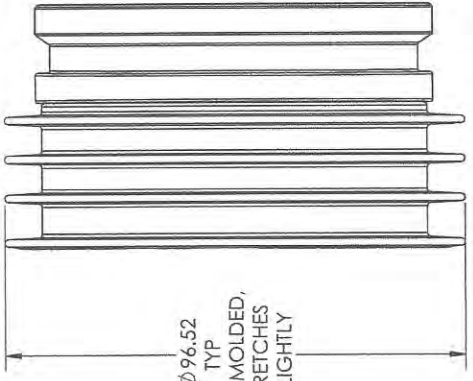
SECTION A-A



SECTION B-B
SCALE 2:1

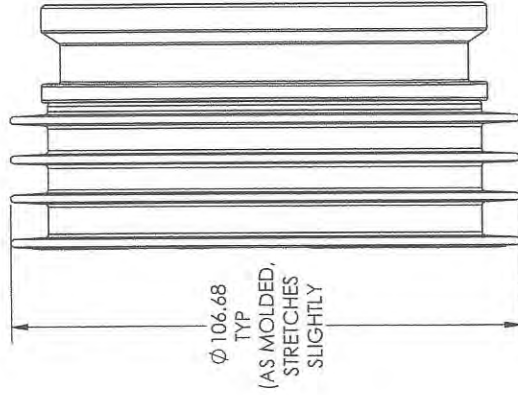
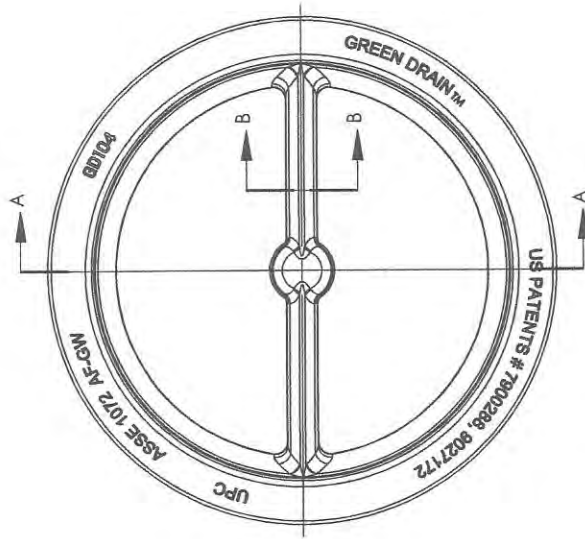
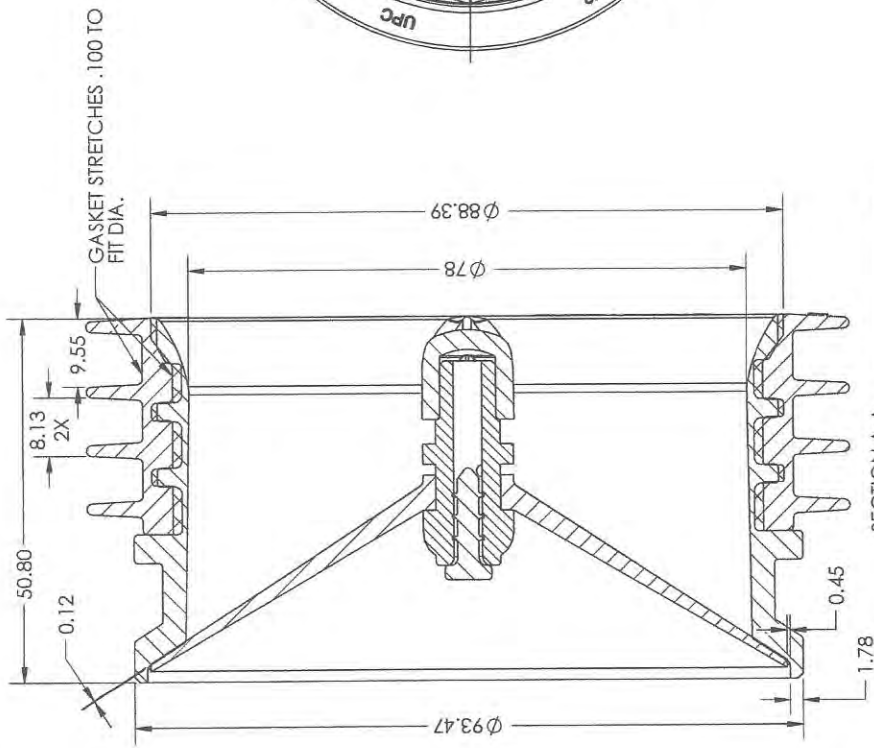


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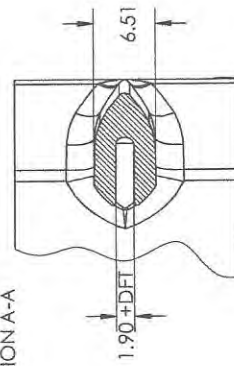


UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS		NAME FLANDON	DATE 10/MAY/2015
DRAWN	CHECKED	TITLE: GREEN DRAIN, GD-103-5	
FRACTIONAL ±	ANGULAR: MACH ±	SIZE B	DWG. NO. 2
TWO PLACE DECIMAL ±	THREE PLACE DECIMAL ±	SCALE: 1:1	WEIGHT: SHEET 1 OF 1
INTERPRET GEOMETRIC TOLERANCING PER:	COMMENTS:	REV	
MATERIAL	NOTED	1	
FINISH	NOTED	2	
INBT ASY	USED OH	3	
APPLICATION	DO NOT SCALE DRAWING	4	

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SECTION A-A



SECTION B-B
SCALE 2:1

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS TOLERANCES: FRACTIONAL: ANGULAR: MACH 1 TWO PLACE DECIMAL: THREE PLACE DECIMAL: INTERPRET GEOMETRIC TOLERANCING PER: MATERIAL: FINISH: NEXT ASSY: APPLICATION:		NAME: FLANDON DATE: 10/MAY/2015	DRAWN: CHECKED: ENG APPR: MFG APPR: Q.A. COMMENTS:	TITLE: GREEN DRAIN, 4 INCH	SIZE: B	DWG. NO.:	REV: 2
DO NOT SCALE DRAWING					SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

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Part number cross reference:

Green Drain, Inc.

Part Numbers

- 2" Drain GD-102
- 3" Drain GD-103
- 3.5" Drain GD-1035
- 4" Drain GD-104

Liquid Breaker, LLC

Part Numbers

- 2" Drain GD-102
- 3" Drain GD-103
- 3.5" Drain GD-1035
- 4" Drain GD-104

Jones Stephens Corporation

Part Numbers

- 2" Drain P24001
- 3" Drain P24002
- 3.5" Drain P24003
- 4" Drain P24004