



TEST REPORT

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Report Number: 321-20188

Project No.: 33668

Report Issued: June 12, 2020

Client: MIFAB Incorporated
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Contact: Michael Whiteside

Source of Samples: The samples were shipped to IAPMO R&T Lab from MIFAB Incorporated and received in good condition on January 28, 2020, and May 18, 2020.

Date of Testing: March 11, 2020 through June 11, 2020.

Sample Description: Shielded Hubless Couplings

Models: MI-QXHUB-X

X = *1-1/2", 2", 3", 4", 5", 6", 8, 10 & *12" sizes

“*” = tested samples.

Scope of Testing: The purpose of the testing is to determine if the samples tested of the Shielded Hubless Couplings meet all applicable requirements of ASTM C1540-2018, entitled “Standard Specification for Heavy Duty Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings”.

Conclusion: the tested samples of the Shielded Hubless Couplings, models noted above, from MIFAB Incorporated, COMPLY with all the applicable requirements of ASTM C1540-2018.

Tested by,

Reviewed by,

Lawrence S. Owens, Test Technician

Sean Vuu, P.E., Manager, Specialty Projects

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Primary Standard: ASTM C1540-2018; Sections tested / evaluated:

4. Materials and Manufacture
5. Elastomeric Gasket Requirements
6. Clamp Assembly Requirements
7. Coupling Requirements and Test Methods
8. Markings and Identification

Test Results: All tests and evaluations were conducted per the written procedures specified in the standard.

ASTM C1540-2018:

4. Materials and Manufacture

4.1 COMPLIED (identical to the materials in IAPMO R&T File 5225)

The physical and chemical properties of gaskets comply with Specification C564 in accordance with Column “C” of Table 1. In addition, the dimensions are in accordance with Fig. 2 and Table 2.

Findings: Figure 2: Gasket detail:

Size: 1-1/2”	A	B
Measured (in)	1.507	3.015
Required (in)	1.485-1.515	2.975-3.025

Size: 12”	A	B
Measured (in)	2.810	5.560
Required (in)	2.690-2.810	5.440-5.560

4.2 COMPLIED. The clamp assembly screws do not have screwdriver slots.

4.3 COMPLIED. All stainless steels (300 series) meet the physical requirements of Specification A240/A240M.

5. Elastomeric Gasket Requirements – COMPLIED.

The Elastomeric Gasket material is identical to the material in UPC File 5225.

6. Clamp Assembly Requirements

6.1 COMPLIED. The shield and clamp assembly are made of material conforming to the requirements outlined in Sections 4 and 6, Table 3, and Fig. 3.

Findings: Figure 3: Clamp detail:

Size: 1-1/2"	Screw housing		Band	
	Width	Length	Width	Thickness
Measured (in)	0.80	0.79	0.554	0.023
Required (in)	0.81 max	0.80 max	0.495-0.630	0.022-0.031

Size: 12"	Screw housing		Band	
	Width	Length	Width	Thickness
Measured (in)	0.80	0.079	0.540	0.025
Required (in)	0.92 max	1.10 max	0.495-0.630	0.022-0.031

Figure 3: Shield detail

Size: 1-1/2"	P ^{††} (in.)	C [†] (in.)	L (in.)	W (in.)	Thickness (in.)	Corrugation	
						Width	Height
Measured (in)	1.46	5.63	7.93	2.985	0.0070	0.09	0.026
Required (in)	0.581-1.063	6.688	7.37 (min)	2.985-3.015	0.0065 (min)	0.06-0.10	0.022-0.034

[†]dimension is for reference only.

^{††}Other corrugations unique to individual manufacturers are acceptable. The "P" dimension may not apply to all coupling designs.

Figure 3: Shield detail

Size: 12"	P ^{††} (in.)	C [†] (in.)	L (in.)	W (in.)	Thickness (in.)	Corrugation	
						Width	Height
Measured (in)	1.687	41.25	42.937	5.514	0.0075	0.095	0.026
Required (in)	3.000-4.000	39.100 [†]	42.30 (min)	3.350-5.650	0.0065 (min)	0.05-0.11	0.022-0.034

[†]dimension is for reference only.

^{††}Other corrugations unique to individual manufacturers are acceptable. The "P" dimension may not apply to all coupling designs

6.1.1 COMPLIED. All parts are made of 300 series stainless steel in addition conforms to the requirements of Specification A240/A240M. The screws are made from round stock that are made of 300 series stainless steel. In addition, the screw stock conforms to the requirements of Specification A493.

Component	Material type	
	Observed	Required
Band	SS-304	SS-301 or SS-304
Screw housing (upper)	SS-304	SS-301 or SS-304
Screw housing (lower)	SS-304	SS-301 or SS-304
Screw	SS-304	SS305 or SS-304L
Rivet	SS-304	SS-304
Shield	SS-304	SS-301 or SS-304

6.1.2 COMPLIED.

The clamp assemblies were tested to withstand no less than 125% of the manufacturer's stated installation torque or a minimum of 80 lbf·in of applied torque. The clamp assembly was tested over a steel mandrel of the appropriate diameter and torqued as required.

Findings: the samples withstood and applied torque load of 100 lbf·in.

7 Coupling Requirements and Test Methods

7.1.1 Deflection Test – COMPLIED

The hubless coupling was set up per Fig. 4 of the standard. A hydrostatic pressure was applied to 8.6 psi. One pipe was rigidly supported and while under pressure, the opposite end was raised to 1 inch per linear foot of the pipe and maintained for 15 minutes.

Finding:

Model	Nominal Diameter (in.)	Leak	Status
MI-XHUB-1-1/2	1-1/2	NO	PASS
MI-XHUB-12	12	NO	PASS

7.1.2 Shear Test – COMPLIED.

The hubless coupling was set up per Fig. 5 of the standard. The sample was subjected to 50 lbs/in of nominal diameter (1-1/2" & 8"), with the system pressurized to 8.6 psi and maintained for 15 minutes. There shall be no leakage and the maximum displacement shall be less than 3/8".

Finding:

Model	Nominal Diameter (in)	Load (lbs)	Leak	Maximum Displacement (in)	Status
MI-XHUB-1-1/2	1-1/2	75	NO	0.021	PASS
MI-XHUB-12	12	600	NO	0.044	PASS

7.1.3 Unrestrained Hydrostatic Test – COMPLIED.

The hubless coupling was set up per Fig. 7 of the standard. A hydrostatic pressure was applied in increment 1 psi at 30 seconds intervals until specified pressures noted in sub-section 7.2.4.2 were reached and maintained for 15 minutes. Pressures and displacement of the samples tested are noted below. There shall be no leakage, and axial joint movement shall not be more than 0.150".

Findings:

Model	Nominal Diameter (in)	Pressure (psi)	Leak	Maximum Displacement (in)	Status
MI-XHUB-1-1/2	1-1/2	30	NO	0.008	PASS
MI-XHUB-12	12	6	NO	0.020	PASS

8. Markings and Identification

8.1 The markings are permanent on the clamp assemblies and are noted as shown below:

- The manufacturer's name or U.S. registered trademark "AMKO MIFAB"
- Country of origin "Thailand"
- All stainless "ALL SS"

- The pipe sizes for which each model is designed.
- The markings are visible after installation.

8.2 Gasket markings shall conform to Specification C564 – COMPLIED (see notes below)

ASTM C564-14:

11. Marking

11.1 Mark each gasket with clearly legible letters not exceeding 1/4 in. (6.35 mm) in height. These markings are as noted below:

- gasket manufacturer's name or symbol – AMKO MIFAB
- designated pipe sizes – PRESENT
- class – The “XH” designation is included in the individual model numbers (per drawings)
- country of origin – Thailand
- ASTM specification designation – PRESENT

8.3 COMPLIED. The samples also have other markings as required by law which include this designation ASTM C1540.

