IAPMO PS 36-~~2014~~[e1]2025

PUBLIC REVIEW DRAFT

Industry Standard for

Lead-Free Sealing Compounds for Threaded Joints

~~*IAPMO Standard*~~

~~**IAPMO PS 36-2014^{e1}**~~
~~**Lead-Free Sealing Compounds for Threaded Joints**~~
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   (d) rationale for the change.

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   (a) the edition of the standard for which the interpretation is being requested;
   (b) the definition of the problem, making reference to the specific section and, when appropriate, an illustrative sketch explaining the question;
   (c) an explanation of circumstances surrounding the actual field conditions; and
   (d) the request for interpretation phrased in such a way that a "yes" or "no" answer will address the issue.

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IAPMO PS 36-~~2014e1~~2025
Lead-Free Sealing Compounds for Threaded Joints

1 Scope

1.1 ~~1.1~~ Scope

This Standard covers lead-free sealing compounds for threaded joints intended for use in drain, waste and vent, piping, water supply systems, and gas piping, and specifies requirements for materials, physical characteristics, performance testing, and markings.

1.2 ~~1.2~~ Alternative Materials

The requirements of this Standard are not intended to prevent the use of alternative materials or methods of construction, provided such alternatives meet the intent and requirements of this Standard

1.3 ~~1.3~~ Terminology

In this Standard,

(a) "shall" is used to express a requirement, i.e., a provision that the user is obliged to satisfy to comply with the Standard;

(b) "should" is used to express a recommendation, but not a requirement;

(c) "may" is used to express an option or something permissible within the scope of the Standard; and

(d) "can" is used to express a possibility or a capability.

Notes accompanying sections of the Standard do not specify requirements or alternative requirements; their purpose is to separate explanatory or informative material from the text. Notes to tables and figures are considered part of the table or figure and can be written as requirements.

1.4 ~~1.4~~ Units of Measurement

SI units are the primary units of record in global commerce. In this Standard, the inch/pound units are shown in parentheses. The values stated in each measurement system are equivalent in application, but each unit system is to be used independently. All references to gallons are to U.S. gallons.

~~**1.5** Proposals for amendments to this Standard will be processed in accordance with the standards-writing procedures of IAPMO.~~

~~**1.6** The user's attention is called to the possibility that compliance with this Standard might require use of an invention covered by patent rights. By publication of this Standard, no position is taken with respect to the validity of any such claim(s) or of any patent rights in connection therewith. If a patent holder has filed a statement of willingness to grant a license under these rights on reasonable and nondiscriminatory terms and conditions to applicants desiring to obtain such a license, then details can be obtained from IAPMO.~~

2 Reference Publications

This Standard refers to the following publications, and where such reference is made, it shall be to the current edition of those publications, including all amendments published thereto.

~~ASME B1.20.1 Pipe Threads, General Purpose (Inch)~~

~~NSF/ANSI 61 Drinking Water System Components - Health Effects~~

ASME International (The American Society of Mechanical Engineers)
ASME B1.20.1
Pipe Threads, General Purpose (Inch)

NSF International
NSF/ANSI/CAN 61
Drinking Water System Components - Health Effects

NSF/ANSI/CAN 372
Drinking Water System Components – Lead Content

3 Definitions and Abbreviations

3.1 Definitions

The following definitions shall apply in this Standard:

Crazing – group of surface fissures that appear as small cracks in materials exposed to solvent and stress, typically oriented perpendicular to the stress

3.2 Abbreviations

The following abbreviations apply in this Standard:

ABS — acrylonitrile-butadiene-styrene
CPVC — chlorinated polyvinylchloride
PVC — polyvinylchloride
NPS — National Pipe Size

4 General Requirements

4.1 Characteristics

4.1.1 Sealing compounds shall be suitable for use in metallic or plastic piping.

Note: Sealing compounds should be
(a) lead-free;
(b) flexible;
(c) non-hardening;
(d) non-shrinking; and
(e) lubricating.

~~**4.1.2** Sealing compounds shall be~~
~~(a) lead-free;~~
~~(b) flexible;~~
~~(c) non-hardening;~~
~~(d) non-shrinking; and~~
~~(e) lubricating.~~

4.1.~~3~~2 In addition to the requirements specified in Section 4.1.1, sealing compounds intended to be used in piping made of
(a) ferrous metals shall be non-corrosive; and
(b) thermoplastics shall be non-reactive.

4.1.~~4~~3 Sealing compounds shall be
(a) supplied ready for use, without thinning; and
(b) smooth, homogeneous, and free of lumps.

4.1.~~5~~4 Sealing compounds shall be capable of preventing leaks and seizing of threaded parts.

4.1.~~6~~5 Sealing compounds shall not contain shellac, glycerol, lead, or lead compounds.

4.2 Toxicity

4.2.1 Sealing compounds intended to be used in piping systems that convey or dispense water for human consumption through drinking or cooking shall comply with the applicable requirements of NSF/ANSI/CAN 61.

4.2.2 Sealing compounds intended to convey or dispense water for human consumption through drinking or cooking shall not contain a weighted average lead content in excess of 0.25% when evaluated in accordance with NSF/ANSI/CAN 372.~~When tested in accordance with the applicable test procedures, the lead content of lead-free sealing compounds shall be 0.~~

4.3 Application Temperatures
Sealing compounds shall allow application at temperatures between -7 and 60 ºC (20 and 140ºF).

5 Testing Requirements

5.1 Threaded-Joint Test

5.1.1 Test Procedure

The threaded-joint test shall be conducted as follows:

(a) Pipe used for testing shall be composed of each material as specified by the manufacturer. For metal and plastic specimens, ~~S~~select six short sections of Schedule 40 NPS-1-1/2 threaded pipe and three tapered threaded couplings.
Note: *The pipe sections and couplings are to be conditioned and then assembled as three test specimens, each specimen consisting of two pipe sections and one coupling.*

(b) Clean the pipe sections and couplings and ensure that the threads are free of dirt, grease, oil, and corrosion.

(c) Inspect the threads
  (i) visually for defects; and
  (ii) mechanically ~~(i.e., with ring and plug gauges)~~ for dimensions in accordance with ASME B1.20.1.

(d) Condition each specimen~~,~~ for 4 h~~, each set of two pipe sections and one coupling~~ as follows:
  (i) the first ~~set~~ specimen at -7 ± 2 ºC (20 ± 4ºF);
  (ii) the second ~~set~~ specimen at 23 ± 2 ºC (73 ± 4ºF); and
  (iii) the third ~~set~~ specimen at 60 ± 2 ºC (140 ± 4ºF).

(e) Immediately following conditioning, apply the sealing compound uniformly to the male threads only, in accordance with the manufacturer's instructions and assemble the three test specimens by
  (i) ~~first~~ hand-tightening the joint; and
  (ii) then using a wrench to further tighten in accordance with ASME B1.20.1.

(f) Allow the sealing compound to set at room temperature, in accordance with the manufacturer's instructions.

(g) Fill each test specimen with water.

(h) Pressurize each test specimen to 1,034 kPa (150 psi).

(i) Maintain the pressure for 30 ± 5 minutes.

(j) Check for leakage.

5.1.2 Performance Requirements

There shall be no leakage in any test specimen. If leakage occurs in any test specimen, testing under that specific test conditioning temperature shall be repeated, using a new test specimen. If leakage reoccurs, the ~~compound batch~~sealing compound shall be rejected.

5.2 Reactivity Test

5.2.1 General

The reactivity test shall be conducted

(a) only on sealing compounds intended for use on plastic pipe; and

(b) on each plastic compound for which the sealing compound is recommended to be used by the manufacturer; and~~.~~

~~(b)~~(c) Room temperature ranging from 20 – 25 °C (68 – 77 °F).

5.2.2 Test Procedure

The reactivity test shall be conducted as follows:

(a) Samples may be comprised of:

a. compression or injection-molded material. These samples shall be cut into plaques (3.3 mm (0.13 in) thick, 70 mm (2.8 in) long, and 15 mm (0.5 in) wide. Or,

~~(a)~~b. a section of Schedule 40 NPS 1 pipe at least 70 mm (2.8 in) long and 15 mm (0.5 in wide). ~~Cut compression-molded plaques 3.3 mm (0.13 in) thick, into several strips 70 mm (2.8 in) long, and 15 mm (0.5 in) wide.~~

(b) Ensure the edges are clean and free of machine marks.

(c) Place three strips into the test apparatus as shown in Figure 1, using care not to bend the strips more than necessary.

(d) Observe the strips under 10X magnification for any crazing or cracking already present.

(e) Discard any strips with crazing or cracking and replace with new strips.

(f) Leave the strips on the test apparatus for 5 days.

(g) Carefully remove the strips. Observe them under 10X magnification for crazing or cracking. Discard any strips with crazing or cracking. If these strips are discarded, replace them with new strips and repeat steps (a) through (g) until you have strips without crazing or cracking.

~~(e)~~

~~(f)~~(h) Apply sufficient sealing compound on the flexed strips to cover the top.

~~(g)~~(i) Leave the strips with sealing compound on the test apparatus for 30 days. ~~on the test apparatus.~~

~~(h)~~(j) Carefully remove the sealing compound from the strips and observe them under 10X magnification for crazing or cracking

~~5.3~~5.2.3 Performance Requirements

Crazing, ~~and~~ cracking, or any other surface defects in more than one strip shall constitute failure.

6 Markings and Accompanying Literature

6.1 Markings

Containers of sealing compounds complying with this Standard shall be marked with the

(a) manufacturer's name or trademark;
(b) legend "Non-hardening";
(c) intended application (e.g., "For Metallic Piping", "Not for Use on Plastic Piping", or "Can be Used on Plastic Piping");
(d) type of plastic compound or polymer where the sealing compound may be used, where applicable (e.g., ABS, CPVC, or PVC); and
(e) intended service, where applicable (e.g., "Potable Water", "Non-Potable Applications Only", or "Gas Applications").

6.2 Visibility

Markings shall be permanent and legible.

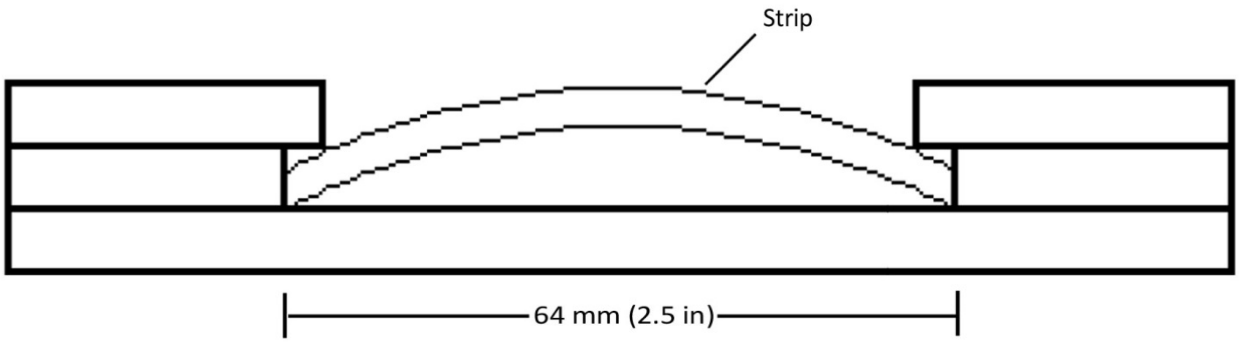
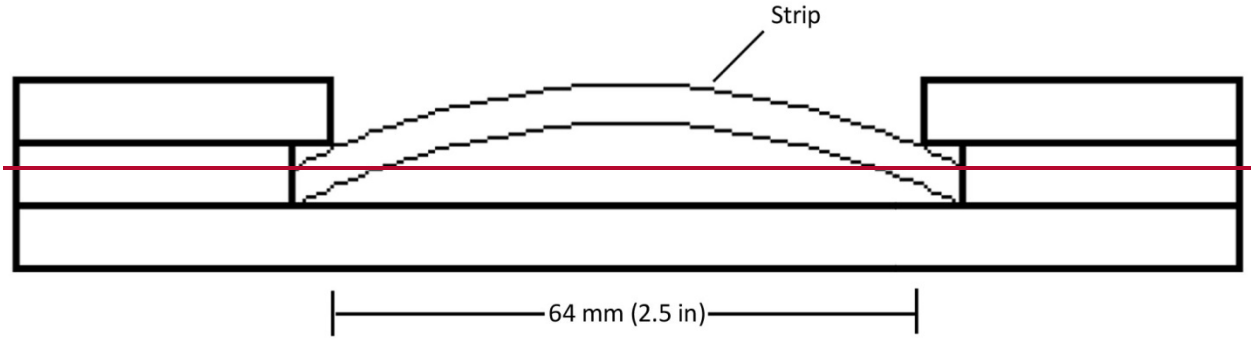


Figure 1
Test Apparatus for the Reactivity Test
(See Section 5.2.2)



~~**Figure 1**~~
~~**Test Apparatus for the Reactivity Test**~~
~~(See Section 5.2.2)~~