

Standard Practice

Sheet Rubber Linings for Abrasion and Corrosion Service

This AMPP standard represents a consensus of those individual members who have reviewed the document, its scope, and provisions. Its acceptance does not in any respect preclude anyone, whether he or she has adopted the standard or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not in conformance with this standard. Nothing contained in this AMPP standard is to be construed as granting any right, by implication or otherwise, to manufacture, sell, or use in connection with any method, apparatus, or product covered by Letters Patent, or as indemnifying or protecting anyone against liability for infringement of Letters Patent. This standard represents minimum requirements and should in no way be interpreted as a restriction on the use of better procedures or materials. Neither is this standard intended to apply in all cases relating to the subject. Unpredictable circumstances may negate the usefulness of this standard in specific instances. AMPP assumes no responsibility for the interpretation or use of this standard by other parties and accepts responsibility for only those official AMPP interpretations issued by AMPP in accordance with its governing procedures and policies which preclude the issuance of interpretations by individual volunteers.

Users of this AMPP standard are responsible for reviewing appropriate health, safety, environmental, and regulatory documents and for determining their applicability in relation to this standard prior to its use. This AMPP standard may not necessarily address all potential health and safety problems, or environmental hazards associated with the use of materials, equipment, and/or operations detailed or referred to within this standard. Users of this AMPP standard are also responsible for establishing appropriate health, safety, and environmental protection practices, in consultation with appropriate regulatory authorities, if necessary, to achieve compliance with any existing applicable regulatory requirements prior to the use of this standard.

CAUTIONARY NOTICE: AMPP standards are subject to periodic review and may be revised or withdrawn at any time in accordance with AMPP technical committee procedures. AMPP requires that action be taken to reaffirm, revise, or withdraw this standard no later than five years from the date of initial publication and subsequently from the date of each reaffirmation or revision. The user is cautioned to obtain the latest edition. Purchasers of AMPP standards may receive current information on all standards and other AMPP/NACE/SSPC publications by contacting AMPP Customer Support, 15835 Park Ten Place, Houston, Texas 77084-5145 (Tel: +1-281-228-6200, email: customersupport@ampp.org).

Document History

- 2023-05-15: Stabilized by AMPP Standards Committee (SC) 04, Linings & Internal Coatings
- 2017-08-30: Reaffirmed by Specific Technology Group (STG) 03 on Coatings and Linings, Protective—Immersion and Buried
- 1998-10-26: Approved as RP0298 by NACE Task Group T-6A-62, a component of Unit Committee T-6A on Coating and Lining Materials for Immersion Service

Foreword

Sheet rubber linings are frequently used for the protection of surfaces such as metal, concrete, or fiberglass against chemical attack, abrasion, or both. Selection of proper lining materials and good lining workmanship are important components of lining performance.

The purpose of this standard practice is to outline procedures for providing sheet rubber lining protection to new and used equipment such as piping and vessels. Included are recommendations for surface preparation and the dimensions of piping that can be rubber lined. An explanation of types of rubber lining materials available and their methods of cure are also given.

This standard is useful to the specification writer as well as the end user. This standard can be used alone or in conjunction with detailed specifications addressing special needs of the end user.

<p>In AMPP standards, the terms <i>shall</i> and <i>must</i> are used to state requirements and are considered mandatory. The term <i>should</i> is used to state something that is recommended, but is not considered mandatory. The term <i>may</i> is used to state something considered optional.</p>

**NACE International
Standard Practice**

Sheet Rubber Linings for Abrasion and Corrosion Service

Contents

1. General.....	1
2. Definitions.....	1
3. Design of Equipment to Be Lined.....	2
4. Types of Rubber.....	5
5. Properties of Linings.....	6
6. Application of Linings.....	6
7. Vulcanization.....	11
8. Inspection and Testing.....	13
9. Repairing Rubber Lining.....	15
10. Storage and Handling of Rubber-Lined Equipment.....	16
References.....	16
Appendix A: Rubber Lining Inspection Worksheet (Not Mandatory).....	17
TABLES	
Table 1: Typical Maximum Lengths for Straight Pipes.....	3
Table 2: Typical Maximum Dimensions for Flanges and Elbows.....	4
Table 3: Typical Maximum Dimensions for Reducers and Tees.....	5
FIGURES	
Figure 1: Elbow.....	3
Figure 2: Reducer.....	4
Figure 3: Tee/Nozzle.....	4
Figure 4: Butt Joint.....	8
Figure 5: Lap Joint.....	8
Figure 6: Slight Overlap.....	8
Figure 7: Reverse Skirt.....	9
Figure 8: Methods of Rubber Lining Flanges.....	10
Figure 9: Grooved End Pipe with Extra Groove.....	11
Figure 10: Grooved End Pipe Without Extra Groove for Lining.....	11
Figure 11: Chain Strip Joint.....	14
Figure 12: Sample for Adhesion Testing.....	15

Section 1: General

1.1 This standard provides requirements for sheet rubber lining of various equipment for protection against corrosion and abrasion. This standard can be used in design, installation, inspection, testing, and storage of rubber-lined equipment.

1.2 This standard addresses sheet rubber (both natural and synthetic) applied over surfaces such as metal and concrete substrates.

1.3 Brushed, trowel-applied, or sprayed rubber linings are outside the scope of this standard.

Section 2: Definitions

Adhesion: The bond between a rubber surface and a nonrubber surface (e.g., metal, wood); the strength of the bond between two uncured rubber surfaces or plies.

Adhesive: Part of a cement system applied over prepared surfaces for bonding them to rubber.

Autoclave: A heavy steel vessel in which rubber articles are vulcanized by means of steam under pressure.

Blister: A cavity within the lining material, between the lining material layers, or between the lining and substrate.

Butt joint: A joint made in a rubber part before or after vulcanization by placing the two pieces to be joined edge-to-edge.

Calender: A machine equipped with two or more heavy, internally heated or cooled rolls used for the continuous sheeting or “plying up” of rubber compounds.

Closed skive: A reverse-angle cut along the edge of a rubber panel. This enables the installer to stitch down the cut edge so that the bottom layer of rubber is protected from exposure to the commodity.

Curing: Chemical process of developing the intended properties of a coating or other material (e.g., resin) over a period of time. For the purposes of this standard, the act of vulcanization; a description of a definite time and temperature of vulcanization.

Defect: An abnormal flaw in the lining that prevents it from performing its function.

Durometer gauge: Apparatus for determining the hardness of rubber by measuring its resistance to the penetration of a blunt indenter point impressed on the surface by spring action.

Durometer hardness: An arbitrary numerical value that measures the resistance to indentation of the blunt indenter point of the durometer.

Extruder: A machine for continuous forming of rubber by forcing through a die.

Fisheye: A thin, elongated void in a calendered sheet that is not detrimental to the lining.

Laitance: A layer of weak and nondurable material containing cement and fine form aggregates, brought by bleeding water to the top of overwet concrete, the amount of which is generally increased by overworking or overmanipulating concrete at the surface by improper finishing or by heavy traffic.

Lap joint: A joint made by overlapping the edge of one piece of material flat over the edge of another.

Overlay: The addition of another layer of lining over an in-place lining construction before vulcanization.

Patch or repair: Remedy of a defect in the lining after vulcanization; involves applying sheet stock to fully cured or vulcanized lining.

Pinhole: A small, pore-like defect or leak extending entirely through the lining thickness and appearing as a discontinuity; synonymous with holiday.

Ply: One layer in a laminated structure.

Primer: The first coat of an adhesive system applied over a prepared surface for adhesion of rubber.

Rubber: Natural rubber or any synthetic, elastomeric material with physical properties similar to those of natural rubber.

Skive: A cut made on an angle to the surface, producing a tapered or feathered edge.

Spark tester: A high-voltage test unit used to detect breaks or holes in a lining.

Substrate: The surface on which a lining is applied.