

HOSE SAFETY INSTITUTE[®]

HANDBOOK

Design and Specification
of Hose Assemblies

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HANDBOOK

*For the
Design and Specification of
Hose Assemblies*



Endorsed by NAHAD Distributor, Manufacturer, and Associate members who have met a stringent set of requirements demonstrating their support for, and compliance with, NAHAD's Hose Assembly Guidelines.



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ACCESSORIES DISTRIBUTION

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Section 1 – Scope & Use of This Document

1.1 Scope

The NAHAD Hose Safety Institute *Handbook for the Design and Specification of Hose Assemblies* is intended to complement existing industry specifications, standards and government regulations. Hose Safety Institute members have agreed in principle to adhere to this document as an aid in the design and selection of suitable hose assemblies, including those using industrial, hydraulic, composite, corrugated metal and fluoropolymer hose.

This document provides general guidelines and is not intended to provide all information or requirements for the design, engineering, assembly and testing of hose assemblies or for compliance with applicable laws, standards, and regulations. Always refer to and follow the supplier's instructions and warnings.

This document is not intended to prohibit either supplier or customer from specifying additional or different requirements for hose, couplings or hose assemblies, if necessary, to satisfy the specific application. It is the responsibility of the fabricator and user to separately qualify these applications and their unique requirements necessary to ensure performance capability.

This document assumes that all equipment used in the fabrication of the hose assembly has been properly maintained and calibrated on a regular basis.

There are specific applications that require additional design, engineering, fabrication, testing, installation and maintenance considerations over and above the requirements set forth in these Hose Assembly Guidelines. This includes applications where custom design, engineering, fabrication, testing, installation and maintenance are specified or required. Please see Section 2.4 and Appendix G of this document for further information.

This document is subject to revision. Users should obtain the latest version.

1.2 Important Notice About This Document

NAHAD (including its members, officers, directors, volunteers, staff and those participating in its activities) disclaims liability for any personal injury, property or other damage of any nature whatsoever, directly or indirectly resulting from the publication, use of, or reliance on this document or for compliance with the provisions herein. NAHAD makes no guaranty or warranty as to the accuracy or completeness of any information published herein.

Hose, hose fittings and hose couplings come in various sizes and designs. Although there are standards published by manufacturers and independent standards and testing organizations, such as ANSI, ASTM, UL, SAE, ARPM, which relate to hoses and hose fittings, there are no generally recognized standards or guidelines for hose assemblies.

NAHAD, The Association for Hose and Accessories Distribution, has published these Guidelines in order to create a reference work that compiles information of value to NAHAD members, manufacturers and customers in developing hose assemblies that meet specific individual needs. To the extent that a hose assembly has unique characteristics or specific requirements, it must be custom designed, engineered and tested.

The Guidelines incorporate pressure recommendations, corrosion recommendations and temperature recommendations published by hose and coupling manufacturers and others. NAHAD has not independently tested or verified these recommendations and specifically disclaims all liability, direct or indirect, for these recommendations.

In making this document available, NAHAD is not undertaking to render professional or other services for or on behalf of any person or entity. Anyone using this document should rely on their own judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstances. Any certification or other statement of compliance with the requirements of this document shall not be attributable to NAHAD and is solely the responsibility of the certifier or the person making the statement.

1.3 How to Use This Document

The following are the recommended procedures on how to use the NAHAD Hose Assembly Specification Guidelines:

	Description	Section Number
1	<p>This document recognizes that all hose assemblies are made up of at least two to three components: the hose, end connections, and method of attachment. The method of attachment and end connection varies depending on the hose selected.</p> <p>The end user/customer/customer service/sales person should use STAMPED to gather all the required application information to proceed with an assembly selection.</p>	<p>Section 2 STAMPED</p>
2	<p>For Industrial Hose assemblies, proceed to the Component Selection Chart. Use the chart to select the appropriate hose, end connections and method of attachment recommended. Note: Hose assembly pressure ratings vary by hose, fitting, and attachment combinations, and are <u>always</u> rated at the lesser of the hose, fittings, and attachment method used. *</p>	<p>Section 5 Hose Assembly Component Selection Chart</p>
3	<p>More detailed information on hose, couplings, attachments, etc. for all hose groups can be found in Sections 4-8, Hose Assembly Components and Data Sheets.</p>	<p>Sections 4-8 Hose Assembly Components and Data Sheets</p>
4	<p>Once the assembly is selected, additional information on fabrication processes can be found in the NAHAD Hose Assembly Fabrication Guides (restricted to Hose Safety Institute members only), which include recommended assembly procedures, limitations, and warnings.</p> <p>The rest of this document includes related information on assembly testing, quality plan, shipping & handling, safety issues, etc.</p>	<p>Sections 9 - 12 Assembly testing, quality plan, shipping, handling, labeling, etc.</p>

* The ARPM requires that hose working pressures include a design factor commensurate with their intended application. Most hoses are required to meet a 4:1 design ratio, except the following: Water hose rated under 150 PSI requires a 3:1 design ratio; Steam hose requires a 10:1 design ratio; and hose conveying gas in a liquid state requires a 5:1 design ratio, or otherwise controlled by other industrial standards. (For example: a 150 PSI-rated air hose has a 4:1 design ratio and must be successfully burst tested to a minimum of 600 PSI.) **Never exceed the working pressure of the lowest rated component in the hose system.** Maximum working pressure includes the highest pressure the system will experience, such as spikes, surges, and water hammer effects. (For example: If a system consists of a hose rated to 150 PSI and the couplings are rated to 500 PSI, the system should never be used in excess of 150 PSI.)

1.4 Thanks and Recognition

NAHAD wishes to acknowledge the contributions of many organizations which have made this document possible. In particular, the International Fluid Power Society (IFPS) has made significant contributions to Section 7 Hydraulic Hose; many portions of their *Connector and Conductor Study Manual* (rev. 4/1/11) were used by permission in whole, or in part. We also wish to acknowledge and thank the Association for Rubber Products Manufacturers (ARPM) for content used or referenced in this document.