

E & H

MANUFACTURING, INC.

TANK BUILDING SPECIFICATIONS
ATMOSPHERIC STORAGE TANKS

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INTRODUCTION

E & H Manufacturing, Inc. (E & H) has been manufacturing steel tanks since 1978. Our specifications mirror some of the most commonly used tank building specs, such as found in API Spec 12F and API Standard 650 product categories. Our operating and purchasing procedures are governed by our ASME Section VIII, Division 1 Quality Control Manual and meet all the specs of our API Spec Q1 Quality Management System

E & H has had their ASME Certification since 1992 and has built thousands of vessels bearing the ASME U-Stamp. ASME specifications and requirements are unmatched throughout industry in regards to design, materials, purchasing and welding procedures, inspection, and testing of the vessels that bear their stamp. The knowledge and experience we have gained from building to these standards, and applying these standards to our tank building, insures us a quality tank every time.

E & H's R-Stamp, issued by The National Board of Boiler and Pressure Vessel inspectors, allows us to perform repairs and alterations on ASME Code vessels. Having this makes us keenly aware of the problems that occur from faulty installation or use of tanks, inadequate material purchasing and handling procedures, and substandard quality controls. This knowledge is the reason and the basis for many of our specifications.

Authors of industry specs have used suggestions from manufacturers over the years to assemble a number of different tank building specifications. We selected the best and most practical of these from which we prepared our specs. These specs are available to our customer's so they have a standard upon which to rely, and from which they can make optimal purchasing decisions. Additions and improvements to this compilation allow us to stay current with all the latest technologies.

The API monogram does not assure conformance, as stated in their 12F specs, "API does not represent, warrant, or guarantee that such products do in fact conform to the applicable API standard". With E & H, you have a living entity that not only has a coveted reputation to protect, but stands behind their tanks with guaranteed conformance to our standards, and product liability for your protection.

We consider these specs a living document. When new materials, procedures, or equipment becomes available to improve your tanks then our document will evolve to reflect it. Customized tanks with any design changes you may need, as long as they meet sound engineering principles, can also be provided. By not being constrained or restricted to any one set of industry specs, we have the flexibility and design experience within these specifications to meet your needs.

SCOPE

This manual is written to provide transparency to our customers and to serve as a guide to our employees concerning E & H's tank building procedures. It is a compilation of the best specs from a variety of standards such as API, ASME, and ASTM, to mention a few. It includes practical applications from many years of tank building and integrity evaluations.

These specifications will be used in building any of the standard tank sizes as displayed on our website (eandhmanufacturing.com), as well as any approved customer designed tanks. These tanks are for the storage of liquids under atmospheric pressure conditions. Pressurized vessels are covered elsewhere under E & H's ASME Sect. VIII Div. 1 Quality Control Manual.

MATERIALS

All material specs will be the same as stated in the API 12F product category specifications. For quick reference each component is listed below with the appropriate spec designated.

Plate for sides, top, and bottom	ASTM A36, A283-C or D, and A285-C
Manual arc-welding electrodes	AWS A 5.1 / E60 and E70
Structural Steel	ASTM A36
Steel Piping	API 5L, ASTM A53, and ASTM A106
Steel Flanges	ASME B16.5
Couplings & Half Couplings	ASME B16.11

Properly purchasing materials is critical for assuring tank integrity. Ordering, receiving, material tracking, storage, handling, and product documentation are all critical parts of our tank building process. Complimentary sections taken from our API spec Q1 Manual and our ASME QC Manual provide us with an accurate and efficient system thereby insuring the correct composition of each tank.

DESIGN

Optimum designs evolve from years of tank building experience complimented by evaluations concerning the integrity and use of products over extended periods of time. Based on knowledge gained from this, we then select design parameters that deliver optimum performance. This has been done to allow us to develop tank designs upon which we can stake our reputation and provide our customers the best product.

Shown below is the design selected for each step of our tank building process. Many are the same designs suggested by API and/or mandated and enforced by ASME. Any variation is based on improved product performance to which we feel the customer is entitled.

- 1) Tank bottoms are flat, joined by a butt weld with complete penetration when more than one piece is required, then flanged for strength and trueness. They are secured to the sides with double welded lap joints (full fillet welds, minimum of 3/16").
- 2) All vertical and horizontal welds on side pieces are double welded lap joints.
- 3) Tank tops are joined by butt weld with complete penetration when more than one piece is required, then flanged for strength and trueness. Flat tops are most common but domed tops are available upon request. Tops are secured to the sides on the outside with fillet welds.
- 4) Couplings and half couplings are secured with full fillet welds on the inside and outside. Couplings will be secured with equal projection inside and outside, while half couplings will have ¼" minimum internal projection.
- 5) When flanged nozzles are specified by the customer, the nozzle necks shall be standard weight pipe or heavier and be attached with full fillet welds on the inside and outside.
- 6) Unless otherwise specified, the cleanout will be a 20" diameter cleanout on 210's or smaller and 24" diameter cleanout on 400's, secured with full fillet welds on the inside and outside, located 4" up from the bottom of the tank. A 4" drain will be located at ground level for flushing tank out. A 24" x 36" rectangular cleanout, per API specs, is available but not recommended due to its propensity for leakage.

- 7) Manway options on top of the tank include a 16" manway with a steel hinged lockable lid with child guard, or a thief hatch set at 4 oz. pressure and .4 oz. vacuum.

STAIRWAYS AND PLATFORMS

Since API does not guarantee or enforce compliance to any shop floor or product integrity standards, and since API standards are not regulated by any government agency, we have chosen to use the specifications to which our customers do have to comply. Regulatory enforcement for stairways, platforms walkways, railings, toe boards, etc. comes from OSHA General Industry Standards sections 1910.23 and 1910.24. When the customer specifies "OSHA approved" products they will comply with these OSHA specs. Where a customer doesn't feel the need to go with products built to OSHA specs we also still have available the standard products that many in industry have been buying for years.

INTERIOR LININGS

Most customers buying tanks built for storage of produced fluids, especially those expected to hold oil, do not request an internal lining. Our customers are not required to incur that expense unless they choose to. Should they specify a particular lining, we will comply with the manufacturer's product specs and apply the liner accordingly.

EXTERIOR PAINT

Protection from the elements for newly completed tanks and accessories being placed into stock is critical. E & H's standard coating for the exterior of these tanks and accessories is red oxide primer. Should customers specify paint in addition to primer, as long as it is compatible with our primer, we will apply it. Where their paint is not compatible, we will build new tanks and accessories, apply the appropriate primer, and then paint according to the paint manufacturer's specs.