

# Design and Construction of Large, Welded, Low-Pressure Storage Tanks

API STANDARD 620  
TENTH EDITION, FEBRUARY 2002

ADDENDUM 1, JUNE 2004



American  
Petroleum  
Institute

**Helping You  
Get The Job  
Done Right.<sup>SM</sup>**



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**Downstream Segment**

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## FOREWORD

This standard is based on the accumulated knowledge and experience of purchasers and manufacturers of welded, low-pressure oil storage tanks of various sizes and capacities for internal pressures not more than 15 pounds per square inch gauge. The object of this publication is to provide a purchase specification to facilitate the manufacture and procurement of such storage tanks.

If tanks are purchased in accordance with the specifications of this standard, the purchaser is required to specify certain basic requirements. The purchaser may desire to modify, delete, or amplify sections of this standard, but reference shall not be made to this standard on the nameplate or manufacturer's certification for tanks that do not fulfill the minimum requirements or that exceed the limitations of this standard. It is strongly recommended that such modifications, deletions, or amplifications be made by supplementing this standard, rather than by rewriting or incorporating sections of it into another complete standard.

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This standard is not intended to cover storage tanks that are to be erected in areas subject to regulations more stringent than the specifications of this standard. When this standard is specified for such tanks, it should be followed insofar as it does not conflict with local requirements.

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# CONTENTS

		Page	
1	SCOPE .....	1-1	
	1.1 General .....	1-1	
	1.2 Coverage .....	1-1	
	1.3 Limitations .....	1-2	04
2	REFERENCES .....	2-1	
3	DEFINITIONS .....	3-1	
	3.1 Stress and Pressure Terms .....	3-1	04
	3.2 Capacity Terms .....	3-1	
	3.3 Tank Wall .....	3-1	
	3.4 Welding Terms .....	3-1	04
4	MATERIALS .....	4-1	
	4.1 General .....	4-1	
	4.2 Plates .....	4-1	04
	4.3 Pipe, Flanges, Forging, and Castings .....	4-5	
	4.4 Bolting Material .....	4-6	
	4.5 Structural Shapes .....	4-6	04
5	DESIGN .....	5-1	
	5.1 General .....	5-1	02
	5.2 Operating Temperature .....	5-1	
	5.3 Pressures Used In Design .....	5-1	04
	5.4 Loadings .....	5-2	
	5.5 Maximum Allowable Stress for Walls .....	5-2	04
	5.6 Maximum Allowable Stress Values for Structural Members and Bolts .....	5-8	
	5.7 Corrosion Allowance .....	5-8	
	5.8 Linings .....	5-8	
	5.9 Procedure for Designing Tank Walls .....	5-10	
	5.10 Design of Sidewalls, Roofs, and Bottoms .....	5-11	04
	5.11 Special Considerations Applicable to Bottoms That Rest Directly on Foundations .....	5-18	
	5.12 Design Of Roof And Bottom Knuckle Regions and Compression-ring Girders .....	5-20	
	5.13 Design Of Internal And External Structural Members .....	5-24	
	5.14 Shapes, Locations, and Maximum Sizes of Wall Openings .....	5-26	
	5.15 Inspection Openings .....	5-27	
	5.16 Reinforcement of Single Openings .....	5-27	
	5.17 Reinforcement of Multiple Openings .....	5-35	
	5.18 Design of Large, Centrally Located, Circular Openings in Roofs and Bottoms .....	5-36	
	5.19 Nozzle Necks and Their Attachments to the Tank .....	5-37	
	5.20 Bolted Flanged Connections .....	5-38	
	5.21 Cover Plates .....	5-38	04
	5.22 Permitted Types of Joints .....	5-42	
	5.23 Welded Joint Efficiency .....	5-42	
	5.24 Plug Welds and Slot Welds .....	5-43	
	5.25 Stress Relieving .....	5-43	
	5.26 Radiographic/Ultrasonic Examination .....	5-44	04
	5.27 Flush-Type Shell Connection .....	5-44	02
6	FABRICATION .....	6-1	
	6.1 General .....	6-1	
	6.2 Workmanship .....	6-1	
	6.3 Cutting Plates .....	6-1	
	6.4 Forming Sidewall Sections and Roof and Bottom Plates .....	6-1	04

	Page	
6.5	Dimensional Tolerances . . . . .	6-1
6.6	Details of Welding . . . . .	6-2
6.7	Qualification of Welding Procedure . . . . .	6-2
6.8	Qualification of Welders . . . . .	6-3
6.9	Matching Plates . . . . .	6-3
6.10	Cleaning Surfaces to be Welded . . . . .	6-3
6.11	Weather Conditions for Welding . . . . .	6-4
6.12	Reinforcement on Welds . . . . .	6-4
6.13	Merging Weld With Plate Surface . . . . .	6-4
6.14	Aligning of Main Joints . . . . .	6-4
6.15	Repairing Defects in Welds . . . . .	6-4
6.16	Matching Plates of Unequal Thickness . . . . .	6-4
6.17	Fitting Up of Closure Plates . . . . .	6-4
6.18	Thermal Stress Relief . . . . .	6-4
6.19	Peening Field Welds . . . . .	6-5
7	INSPECTION, EXAMINATION AND TESTING . . . . .	7-1
7.1	Responsibility of Examiner . . . . .	7-1
7.2	Qualifications of Examiners . . . . .	7-1
7.3	Access for Inspector . . . . .	7-1
7.4	Facilities for Inspector . . . . .	7-1
7.5	Approval of Repairs . . . . .	7-1
7.6	Inspection of Materials . . . . .	7-1
7.7	Stamping of Plates . . . . .	7-1
7.8	Measuring Thickness of Material . . . . .	7-1
7.9	Inspection of Surfaces Exposed During Fabrication . . . . .	7-1
7.10	Surface Inspection of Component Parts . . . . .	7-2
7.11	Check of Dimensions of Component Parts . . . . .	7-2
7.12	Check of Chemical and Physical Property Data . . . . .	7-2
7.13	Data Required From Manufacturer on Completed Tanks . . . . .	7-2
7.14	Check of Stress-Relieving Operation . . . . .	7-2
7.15	Examination Method and Acceptance Criteria . . . . .	7-2
7.16	Inspection of Weld . . . . .	7-4
7.17	Radiographic/Ultrasonic Examination Requirements . . . . .	7-5
7.18	Standard Hydrostatic and Pneumatic Tests . . . . .	7-6
7.19	Proof Tests for Establishing Allowable Working Pressures . . . . .	7-8
7.20	Test Gauges . . . . .	7-9
8	MARKING . . . . .	8-1
8.1	Nameplates . . . . .	8-1
8.2	Division of Responsibility . . . . .	8-1
8.3	Manufacturer's Report and Certificate . . . . .	8-1
8.4	Multiple Assemblies . . . . .	8-1
9	PRESSURE- AND VACUUM-RELIEVING DEVICES . . . . .	9-1
9.1	Scope . . . . .	9-1
9.2	Pressure Limits . . . . .	9-1
9.3	Construction of Devices . . . . .	9-1
9.4	Means of Venting . . . . .	9-1
9.5	Liquid Relief Valves . . . . .	9-1
9.6	Marking . . . . .	9-1
9.7	Pressure Setting of Safety Devices . . . . .	9-2
APPENDIX A	TECHNICAL INQUIRY RESPONSES . . . . .	A-1
APPENDIX B	USE OF MATERIALS THAT ARE NOT IDENTIFIED WITH LISTED SPECIFICATIONS . . . . .	B-1
APPENDIX C	SUGGESTED PRACTICE REGARDING FOUNDATIONS . . . . .	C-1

04  
02  
04

04

04

04

04

	Page		
APPENDIX D	SUGGESTED PRACTICE REGARDING SUPPORTING STRUCTURES . . . .	D-1	
APPENDIX E	SUGGESTED PRACTICE REGARDING ATTACHED STRUCTURES (INTERNAL AND EXTERNAL) . . . . .	E-1	
APPENDIX F	EXAMPLES ILLUSTRATING APPLICATION OF RULES TO VARIOUS DESIGN PROBLEMS . . . . .	F-1	04
APPENDIX G	CONSIDERATIONS REGARDING CORROSION ALLOWANCE AND HYDROGEN-INDUCED CRACKING . . . . .	G-1	
APPENDIX H	RECOMMENDED PRACTICE FOR USE OF PREHEAT, POST-HEAT, AND STRESS RELIEF . . . . .	H-1	
APPENDIX I	SUGGESTED PRACTICE FOR PEENING . . . . .	I-1	
APPENDIX J	(RESERVED FOR FUTURE USE) . . . . .	J-1	
APPENDIX K	SUGGESTED PRACTICE FOR DETERMINING THE RELIEVING CAPACITY REQUIRED . . . . .	K-1	
APPENDIX L	SEISMIC DESIGN OF STORAGE TANKS. . . . .	L-1	04
APPENDIX M	RECOMMENDED SCOPE OF THE MANUFACTURER'S REPORT . . . . .	M-1	
APPENDIX N	INSTALLATION OF PRESSURE-RELIEVING DEVICES . . . . .	N-1	
APPENDIX O	SUGGESTED PRACTICE REGARDING INSTALLATION OF LOW-PRESSURE STORAGE TANKS . . . . .	O-1	
APPENDIX P	NDE AND TESTING REQUIREMENTS SUMMARY . . . . .	P-1	02
APPENDIX Q	LOW-PRESSURE STORAGE TANKS FOR LIQUEFIED HYDROCARBON GASES . . . . .	Q-1	
APPENDIX R	LOW-PRESSURE STORAGE TANKS FOR REFRIGERATED PRODUCTS . . . . .	R-1	04
APPENDIX S	AUSTENITIC STAINLESS STEEL STORAGE TANKS. . . . .	S-1	
APPENDIX U	ULTRASONIC EXAMINATION IN LIEU OF RADIOGRAPHY. . . . .	U-1	

Figures

4-1	Isothermal Lines Showing 1-Day Mean Ambient Temperature . . . . .	4-2	
4-2	Minimum Permissible Design Metal Temperature for Pipe, Flanges, and Forgings without Impact Testing . . . . .	4-7	04
4-3	Governing Thickness for Impact Test Determination of Pipe, Flanges, and Forgings. . . . .	4-8	
5-1	Biaxial Stress Chart for Combined Tension and Compression, 30,000–38,000 lbf/in. <sup>2</sup> Yield Strength Steels . . . . .	5-3	04
5-2	Method for Preparing Lap-Welded Bottom Plates Under the Tank Sidewall . . . . .	5-12	
5-3	Detail of Double Fillet-Groove Weld for Bottom Plates with a Nominal Thickness Greater than 1/2 in. . . . .	5-12	
5-4	Typical Free-Body Diagrams for Certain Shapes of Tanks . . . . .	5-14	
5-5	Compression-Ring Region. . . . .	5-22	
5-6	Permissible and Nonpermissible Details of Construction for a Compression-Ring Juncture. . . . .	5-23	04
5-7	Reinforcement of Single Openings . . . . .	5-28	02
5-8	Part 1—Acceptable Types of Welded Nozzles and Other Connections . . . . .	5-30	
5-8	Part 2—Acceptable Types of Welded Nozzles and Other Connections . . . . .	5-31	
5-8	Part 3—Acceptable Types of Welded Nozzles and Other Connections . . . . .	5-32	02
5-8	Part 4—Acceptable Types of Welded Nozzles and Other Connections . . . . .	5-33	
5-9	Large Head Openings and Conical Shell-Reducer Sections. . . . .	5-36	
5-10	Acceptable Types of Flat Heads and Covers. . . . .	5-39	
5-11	Spherically Dished Steel Plate Covers with Bolting Flanges . . . . .	5-41	
5-12	Part 1—Flush-Type Sidewall Connection. . . . .	5-46	
5-12	Part 2—Flush-Type Sidewall Connection. . . . .	5-47	
5-13	Design Factors for Flush-Type Connections . . . . .	5-48	
5-14	Rotation of Sidewall Connection. . . . .	5-49	
6-1	Butt Welding of Plates of Unequal Thickness. . . . .	6-5	
8-1	Nameplate . . . . .	8-2	
F-1	Reduction of Design Stresses Required to Allow for Biaxial Stress of the Opposite Sign . . .	F-2	

	Page	
F-2	Examples Illustrating the Use of a Biaxial Stress Chart for Combined Tension and Compression, 30,000–38,000 Pounds per Square Inch Yield Strength Steels . . . . .	F-5
F-3	Form for Use in Graphical Solutions of Problems Involving Biaxial Tension and Compression, 30,000–38,000 Pounds per Square Inch Yield Strength Steels . . . . .	F-6
F-4	Free-Body Sketch. . . . .	F-8
F-5	Example of a Reinforced Opening . . . . .	F-13
F-6	Example of a Reinforced Opening . . . . .	F-15
F-7	Example of a Reinforced Opening . . . . .	F-18
F-8	Example of a Reinforced Opening . . . . .	F-19
L-1	Seismic Zone Map . . . . .	L-3
L-1	Part 2—Seismic Zone Map . . . . .	L-4
L-2	Curves for Obtaining Factors $W_1/W_T$ and $W_2/W_T$ for the Ratio $D/H$ . . . . .	L-5
L-3	Curves for Obtaining Factors $X_1/H$ and $X_2/H$ for the Ratio $D/H$ . . . . .	L-5
L-4	Curve for Obtaining Factor $k$ for the Ratio $D/H$ . . . . .	L-5
L-5	Curve for Obtaining the Value of $b$ when $M/[D_2(w_t+w_L)]$ Exceeds 0.785. . . . .	L-7
Q-1	Typical Stiffening-Ring Weld Details . . . . .	Q-9
Q-2	Radiographic/Ultrasonic Requirements for Butt-Welded Shell Joints in Cylindrical Flat-Bottom Tanks. . . . .	Q-14
R-1	Typical Stiffening-Ring Weld Details . . . . .	R-5
R-2	Radiographic/Ultrasonic Examination Requirements for Butt-Welded Shell Joints in Cylindrical Flat-Bottom Tanks . . . . .	R-11
Tables		
4-1	Minimum Requirements for Plate Specifications to be Used for Design Metal Temperatures . . . . .	4-3
4-2	Maximum Permissible Alloy Content . . . . .	4-4
5-1	Maximum Allowable Stress Values for Simple Tension . . . . .	5-4
5-2	Maximum Allowable Efficiencies for Arc-Welded Joints. . . . .	5-7
5-3	Maximum Allowable Stress Values for Structural Members . . . . .	5-9
5-4	Sidewall-to-Bottom Fillet Weld for Flat-Bottom Cylindrical Tanks. . . . .	5-12
5-5	Factors for Determining Values of $R_1$ and $R_2$ for Ellipsoidal Roofs and Bottoms . . . . .	5-15
5-6	Tank Radius Versus Nominal Plate Thickness . . . . .	5-18
5-7	Allowable Tension Stresses for Uplift Pressure Conditions . . . . .	5-19
5-8	Minimum Size of Fillet Weld. . . . .	5-24
5-9	Factors for Determining Values of $k$ for Compression-Ring Bracing . . . . .	5-25
5-10	Dimensions of Flush-Type Shell Connections (Inches) . . . . .	5-45
6-1	Sidewall Plate Forming Schedule . . . . .	6-1
6-2	Diameter Range Versus Radius Tolerance. . . . .	6-2
6-3	Maximum Thickness of Reinforcement on Welds . . . . .	6-4
6-4	Stress-Relieving Temperatures and Holding Times . . . . .	6-5
7-1	Maximum Thickness of Reinforcement on Welds for Radiography Examined Joints . . . . .	7-2
F-1	Computed Values of $(t - c)R$ , $s_c$ , $s_p$ , and $N$ for the Assumed Thicknesses: Example 1. . . . .	F-4
F-2	Computed Values of $(t - c)R$ , $s_c$ , $s_p$ , and $N$ for the Assumed Thicknesses: Example 2. . . . .	F-7
F-3	Cross-Sectional Area of Standard Angles: Example 1 . . . . .	F-10
L-1	Seismic Zone Tabulation for Some Areas Outside the United States . . . . .	L-1
L-2	Seismic Zone Factor (Horizontal Acceleration) . . . . .	L-2
L-3	Site Coefficients . . . . .	L-6
Q-1	ASTM Materials for Primary Components . . . . .	Q-2
Q-2	Charpy V-Notch Impact Values . . . . .	Q-3
Q-3	Maximum Allowable Stress Values . . . . .	Q-5
Q-4A	Minimum Thickness for the Annular Bottom Plate: Steel Tanks . . . . .	Q-7
Q-4B	Minimum Thickness for the Annular Bottom Plate: Aluminum Tanks . . . . .	Q-7
Q-5	Nominal Thickness of Inner Tank Cylindrical Sidewall Plates. . . . .	Q-10
Q-6	Radius Tolerances for the Inner Tank Shell. . . . .	Q-10
R-1	Material for Primary Components. . . . .	R-2
R-2	Minimum Charpy V-Notch Impact Requirements for Primary-Component Plate Specimens (Transverse) and Weld Specimens Including the Heat-Affected Zone . . . . .	R-3
R-3	Material for Secondary Components . . . . .	R-3

	Page	
R-4	Minimum Permissible Design Metal Temperature for Plates Used as Secondary Components Without Impact Testing . . . . .	R-4
R-5	Minimum Charpy V-Notch Impact Requirements for Secondary-Component Plate Specimens (Transverse) . . . . .	R-7
R-6	Thickness Requirements for the Annular Bottom Plate . . . . .	R-8
S-1a	ASTM Materials for Stainless Steel Components (SI Units) . . . . .	S-1
S-1b	ASTM Materials for Stainless Steel Components (US Customary Units) . . . . .	S-2
S-2	Maximum Allowable Stress Values for Simple Tension . . . . .	S-3
S-3	Allowable Stresses for Plate Ring Flanges . . . . .	S-4
S-4	Yield Strength Values . . . . .	S-4
S-5	Modulus of Elasticity at the Design Temperature . . . . .	S-4
U-1	Flaw Acceptance Criteria for UT Indications (May be Used for All Materials) . . . . .	U-3
U-2	Alternate Flaw Acceptance Criteria for UT Indications . . . . .	U-4
U-3	Charpy V-notch Impact Values Required to Use Table U-2 for 9% Nickel Steel . . . . .	U-4

04



# Design and Construction of Large, Welded, Low-Pressure Storage Tanks

## SECTION 1—SCOPE

### 1.1 GENERAL

The API Downstream Segment has prepared this standard to cover large, field-assembled storage tanks of the type described in 1.2 that contain petroleum intermediates (gases or vapors) and finished products, as well as other liquid products commonly handled and stored by the various branches of the industry.

The rules presented in this standard cannot cover all details of design and construction because of the variety of tank sizes and shapes that may be constructed. Where complete rules for a specific design are not given, the intent is for the manufacturer—subject to the approval of the purchaser's authorized representative—to provide design and construction details that are as safe as those which would otherwise be provided by this standard.

The manufacturer of a low-pressure storage tank that will bear the API Std 620 nameplate shall ensure that the tank is constructed in accordance with the requirements of this standard.

The rules presented in this standard are further intended to ensure that the application of the nameplate shall be subject to the approval of a qualified inspector who has made the checks and inspections that are prescribed for the design, materials, fabrication, and testing of the completed tank.

### 1.2 COVERAGE

**1.2.1** This standard covers the design and construction of large, welded, low-pressure carbon steel above ground storage tanks (including flat-bottom tanks) that have a single vertical axis of revolution. This standard does not cover design procedures for tanks that have walls shaped in such a way that the walls cannot be generated in their entirety by the rotation of a suitable contour around a single vertical axis of revolution.

**1.2.2** The tanks described in this standard are designed for metal temperatures not greater than 250°F and with pressures in their gas or vapor spaces not more than 15 lbf/in.<sup>2</sup> gauge.

**1.2.3** The basic rules in this standard provide for installation in areas where the lowest recorded 1-day mean atmospheric temperature is – 50°F. Appendix S covers stainless steel low-pressure storage tanks in ambient temperature service in all areas, without limit on low temperatures. Appendix R covers low-pressure storage tanks for refrigerated products at temperatures from + 40°F to – 60°F. Appendix Q covers low-pressure storage tanks for liquefied hydrocarbon gases at temperatures not lower than – 270°F.

**1.2.4** The rules in this standard are applicable to tanks that are intended to (a) hold or store liquids with gases or vapors above their surface or (b) hold or store gases or vapors alone. These rules do not apply to lift-type gas holders.

**1.2.5** Although the rules in this standard do not cover horizontal tanks, they are not intended to preclude the application of appropriate portions to the design and construction of horizontal tanks designed in accordance with good engineering practice. The details for horizontal tanks not covered by these rules shall be equally as safe as the design and construction details provided for the tank shapes that are expressly covered in this standard.

**1.2.6** Appendix A provides information on the preparation and submission of technical inquiries as well as responses to recent inquiries.

**1.2.7** Appendix B covers the use of plate and pipe materials that are not completely identified with any of the specifications listed in this standard.

**1.2.8** Appendix C provides information on subgrade and foundation loading conditions and foundation construction practices.

**1.2.9** Appendix D provides information about imposed loads and stresses from external supports attached to a tank wall.

**1.2.10** Appendix E provides considerations for the design of internal and external structural supports.

**1.2.11** Appendix F illustrates through examples how the rules in this standard are applied to various design problems.

**1.2.12** Appendix G provides considerations for service conditions that affect the selection of a corrosion allowance; concerns for hydrogen-induced cracking effects are specifically noted.

**1.2.13** Appendix H covers preheat and post-heat stress-relief practices for improved notch toughness.

**1.2.14** Appendix I covers a suggested practice for peening weldments to reduce internal stresses.

**1.2.15** Appendix J is reserved for future use.

**1.2.16** Appendix K provides considerations for determining the capacity of tank venting devices.

**1.2.17** Appendix L covers requirements for the design of storage tanks subject to seismic load.