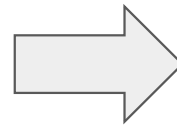
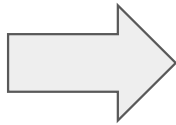


Following Design Standards from a Manufacturing Perspective

OR, how do we make sure tanks are up to the standards?

About me

- Worked as a welder on tanks and accessories as a teenager
- Graduated from Cal Poly SLO, B.S. Civil Engineering
- Practiced as a Surveyor and City Engineer
- Practiced as a Structural Engineer for 12+ years
- P.E. in Civil Engineering
- 3rd generation owner of a steel tank manufacturing company



About my company

- 80+ years in business
- Mostly serving the California agricultural community
- For the sake of this discussion, we manufacture **UL-142** and **UL-2085 Fireguard®** AST tanks.

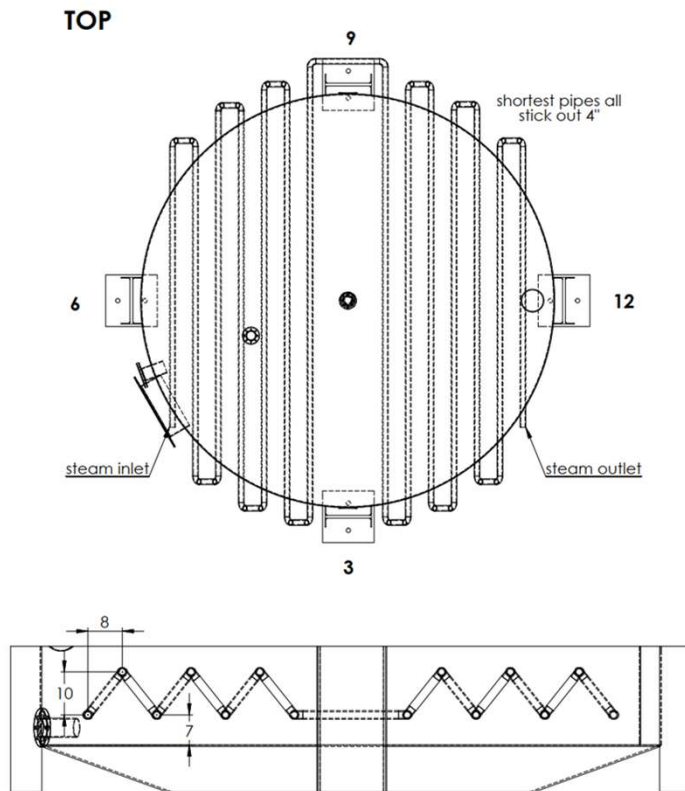


Questions I want to try and answer today

- What part of a tank assembly actually falls under UL AST manufacturing guidelines?
- How do manufacturers of UL AST tanks ensure code compliance?

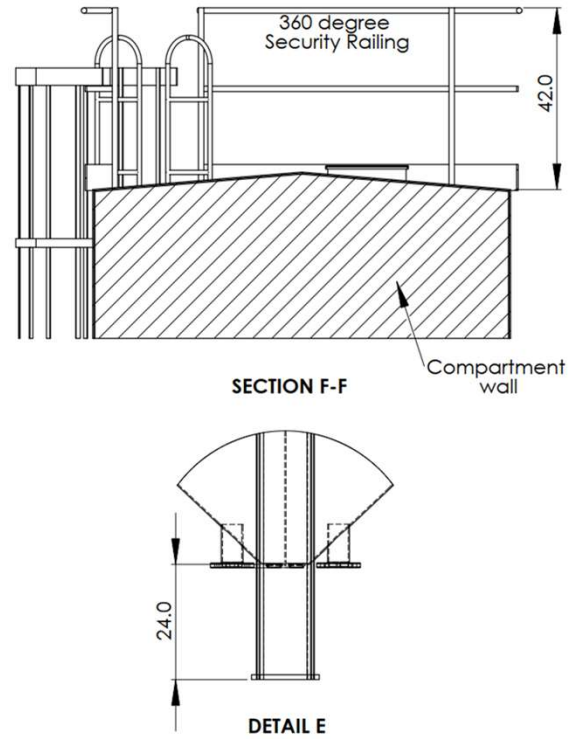
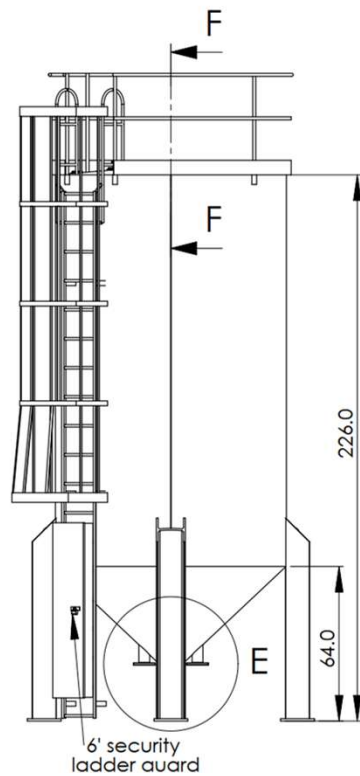
Which parts of a tank constitute a “tank” per UL?

Short answer; If it's welded to the tank, it's part of the tank, with a few exceptions



The Primary Exceptions - Ladders and Guardrails

Bolted Ladders
ARE
in the standards



Other exceptions to the “welded to the tank” rule

Manhole lids



Labels



Conclusion to Part 1

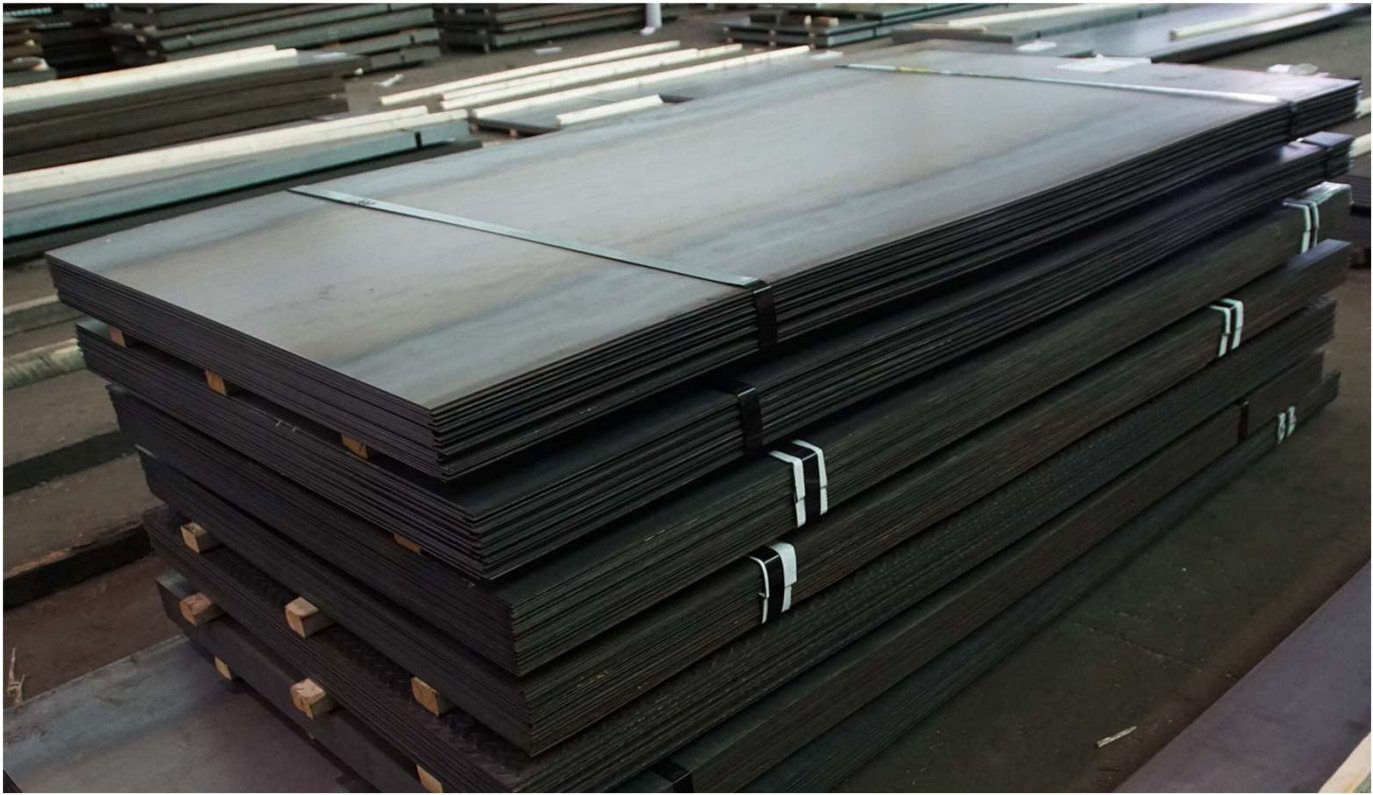


How does the manufacturer ensure code compliance?

Short answer; They are either meticulous in their methods, or else they choose not to comply.

Let's walk through the fabrication process to see how it's done.





INVOICE

Bill Of Lading

GST Number: [REDACTED]

Ship To
 Mosier Brothers
 15580 Ave 344
 Woodlake, CA 93286

Date: DEC-09-2024 Terms: [REDACTED] Via: [REDACTED] F.O.B.: [REDACTED]

Customer PO: [REDACTED]

Line	Material Description	Size	Footage	Part Number	Module
1	Strip Mill Plate 1/4" ASTM A36	72" x 324"	4516	[REDACTED]	[REDACTED]

Charge Type	Material	Plates	Weight	Price / Lb	Extension
		25	46.312		

Handwritten:
 .242
 .244
 .242
 C OK
 M.T.
 1-7-25



Mill Test Report

California Steel Industries
 14000 San Bernardino Ave.
 Fontana, California, USA 92335
 Tel: (951) 835-4300 Fax: (951) 835-4301
 Email: sales@csi.com

Product: H.R. Sheet Processed Coil (ME)
 End Use: WAREHOUSE STOCK
 Thickness: 0.2400 IN Min
 Width: 72.0000 IN Edge: Mill
 Length: [REDACTED]

Finish: [REDACTED]
 Coating Weight: [REDACTED]
 Chain Treat: [REDACTED]
 U.S. Steel Required: No
 HCBM Compliant: Yes

Purchase Order: [REDACTED]
 Shipment Number: [REDACTED]
 Certificate Delivery No: [REDACTED]
 Sales Order: [REDACTED]
 Prod. Order Number: [REDACTED]
 Invoiced Date: [REDACTED]
 Released On: [REDACTED]
 Attention: [REDACTED]
 Page 01 of 01

Material Specification: [REDACTED]

Material Specification Requirements
 Specification: PD IN CONFORMANCE WITH ASTM A36-14 CHEMICAL AND TENSILE REQUIREMENTS

Add'l Req.	Min		Max		Add'l Req.		Min		Max		Add'l Req.		Min		Max	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
MIN	0.80	1.20														

Testing Parameters: Yield, Tensile, Elong, R-Value

Heat	Coil	Loc	Yield	Tensile	Elong	R-Value	Delta R	N-Value	Loc	Result	Loc	Value
C00763	182319	H	42.4	67.5	28.0	0.88	1.92					

Chemical Analysis, wt%

Heat	Coil	Type	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Al	V	Co	Ti	B	N	Ca
C00763	182319	H	0.19	1.13	0.008	0.007	0.037	0.01	0.11	0.02	0.001	0.006	0.006	0.001	0.001	0.001	0.001	0.001

Mechanical Testing Results

Heat	Coil	Loc	Absorbed Energy, ft-lb			Percent Shear			Lateral Expansion, in.									
			Spec 1	Spec 2	Spec 3	Avg	Spec 1	Spec 2	Spec 3	Avg	Spec 1	Spec 2	Spec 3	Avg				
C00763	182319	H																

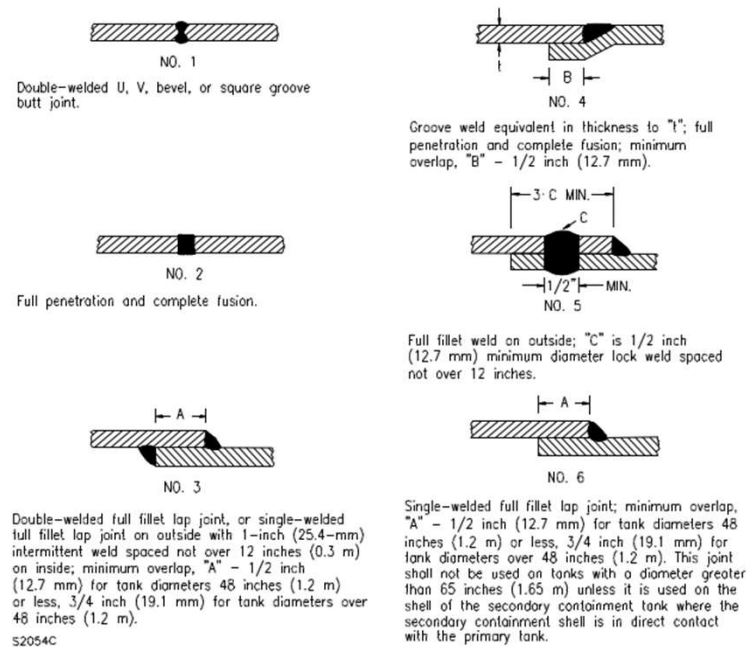
Summary of Material on Delivery and Special Test Results

Heat	Coil	Weight	Length	Supplier Information	Found Name and Location	Special Statements
C00763	182319	46607 (1740)	675'	CLEVELAND CLIPPER, CLEVELAND, OHIO	CLEVELAND, OHIO	

Special Statements

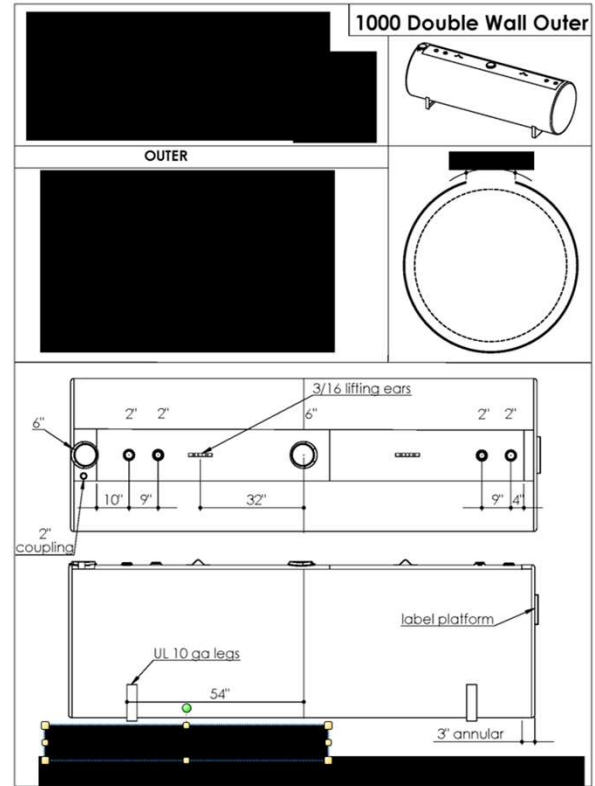
EN15204:2004 TYPE

Figure 6.1
Shell joints



S2054C





Quality Control and Custom Work



Leak Testing - How do we know it's been done?



Testing...

Mosier Bros.

Tank	Non-Code Fireguard	UL 142 Permatank	UL 142 Doublewall UL 1746 Doublewall
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UL# P-522216

Inner Tank
Initial test

Date 2-6-25 Pressure 5 psi Repairs Operator L.R.

Retest

Date 2-6-25 Pressure 5 psi Repairs Operator R.H.

Secondary Tank
Initial test

Date 2-12-25 Pressure 5 psi Repairs Operator L.R.

Retest

Date 2-12-25 Pressure 5 psi Repairs Operator R.H.

Notes
500 FG-60



