

***Fabrication Division***

***Corrosion Resistant Alloy Heat Exchangers,  
Pressure Vessels, Tanks, Columns, Special Fabrications  
and Prefabricated Piping Systems***

**ALASKAN COPPER**



ALASKAN COPPER WORKS

## History

When Alaskan Copper Works was founded as a marine coppersmithing company in 1913, its major activities were forming and brazing piping, kettles, coils and other products made from copper, brass and bronze, primarily for the Pacific Northwest shipbuilding industry.

Beginning in the 1920's, many of the area's growing process industries, such as pulp and paper, which had relied on wood stave and cast iron as corrosion resistant materials for their tanks and piping, welcomed the development of a new weldable alloy, silicon bronze. This alloy had special advantages in cost and corrosion resistance. Alaskan Copper Works participated in the transition to this innovative metal and in the development of the welding techniques necessary for its proper fabrication.

Superior corrosion resistant alloys became available to the pulp and paper industry with the development of austenitic stainless steels in the 1930s. Alaskan Copper Works also participated in the application of this new material and in the development of related welding and fabricating techniques. Other process industries, such as petrochemical and food processing, also made use of these new alloys and of our experience in their fabrication.

Today, the Fabrication Division of Alaskan Copper Works is one of the nation's most experienced organizations devoted exclusively to the fabrication of stainless steel, high nickel alloys, duplex stainless alloys, copper-nickel alloys, aluminum, titanium, zirconium, copper and other weldable corrosion resistant alloys.



Alaskan Copper Works yesterday



Alaskan Copper Works today.

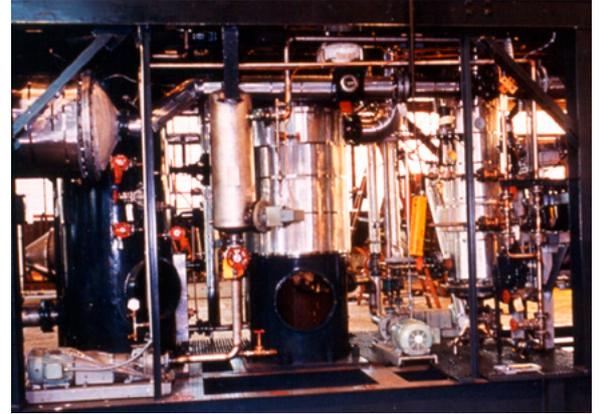
## Industries Served

Unique and strict requirements exist within every industry. For years, the pulp and paper, marine, chemical, petrochemical, food processing, beverage, wastewater treatment and other industries have relied on Alaskan Copper Works for fabrication experience and technical knowledge. Alaskan Copper Works strives continually to expand its ability to be a valuable resource for industries that require the use of modern corrosion resistant alloys.

Extensive experience in engineering and producing complex fabrications and prefabricated piping systems has helped Alaskan Copper Works build and maintain a strong reputation for capability, quality and dependability.



24" diameter stainless steel pipe used in the pulp and paper industry to load pulp into a bleached pulp stock chest.



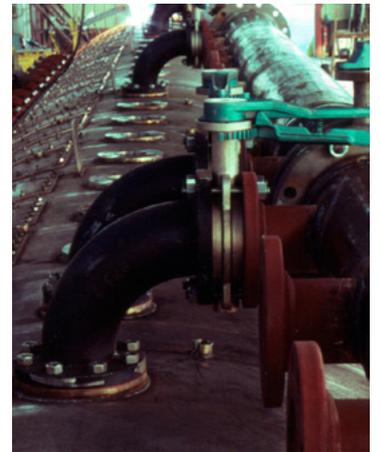
Skid-mounted formaldehyde production plant for the chemical industry completely assembled within our fabrication facility.



Tank shell for the food processing industry made into one continuous piece using automatic splice welding prior to rolling.



Vapor recompression evaporator sump used in the wastewater treatment industry.



Stainless steel multi-tray column used in the chemical industry.



Extractor tower, 90" diameter x 1/2" wall x 83 ft. high with prefabricated platforms, fabricated from Type 304 stainless steel for the petrochemical industry.

## Facilities and Equipment

The Fabrication Division of Alaskan Copper Works consists of over 250,000 square feet of plant space dedicated to meeting the needs of our customers for properly fabricated corrosion resistant metal products.

Economic and efficient methods for producing complicated products are found within our modern facilities. Well-maintained and updated fabrication equipment, coupled with an experienced work force and a complete in-house quality control staff, allow Alaskan Copper Works to provide high-quality corrosion resistant fabricated products.

Our special production services, which include coil cut-to-length processing, computer controlled plasma cutting, precision sawing and sheet and plate splice welding, provide customers with consistent cost savings.



Shell manufacturing capabilities include a 20 ft. long press brake.



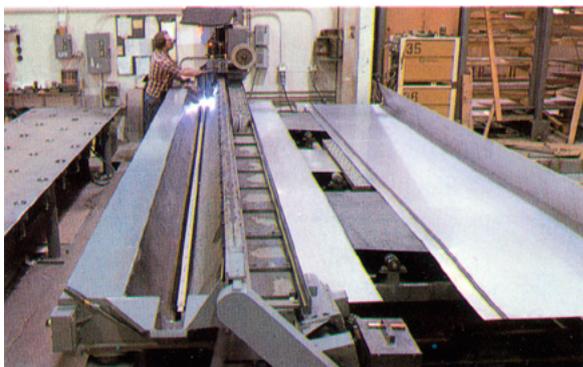
Shell rolling operation can fabricate shells up to 20 ft. diameter and 1/2" thick.



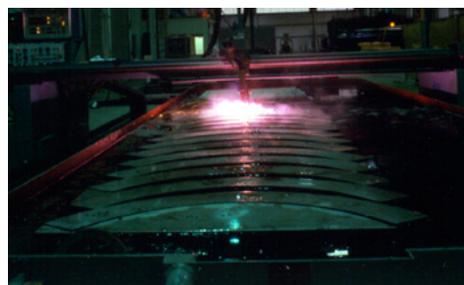
1/2" stainless steel and 3/4" aluminum can be processed in up to 20 ft. lengths on the shear shown above. Other in-house shears can process material up to 1" thick.



Our cut-to-length facility allows efficient use of sheet and plate material for fabrication without excess welding.



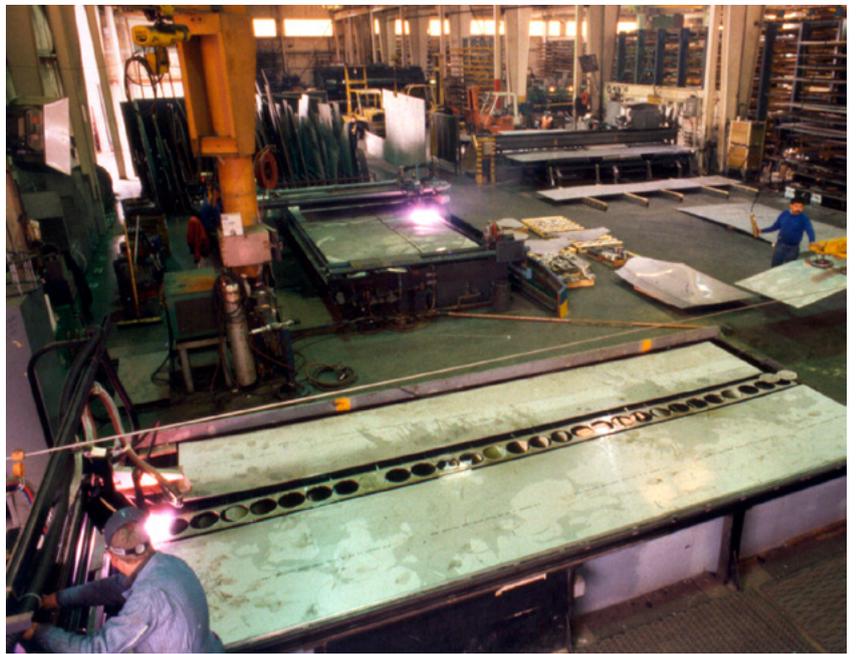
Splice welding using automatic double-sided gas tungsten-arc welding.



Computerized automatic plasma cutting creates multiple parts and complex shapes up to 3" thick and as large as 96" x 240".



Circumferential seam welding of a large pressure vessel using a submerged-arc welding manipulator and turning rolls.



70 ft. wide clear span plate fabrication facility served by overhead cranes totaling 30 tons of lifting capacity.

60 ft. wide x 240 ft. long main fabrication bay serviced by overhead cranes totaling 40 tons of lifting capacity with 31 ft. clearance under the hook.



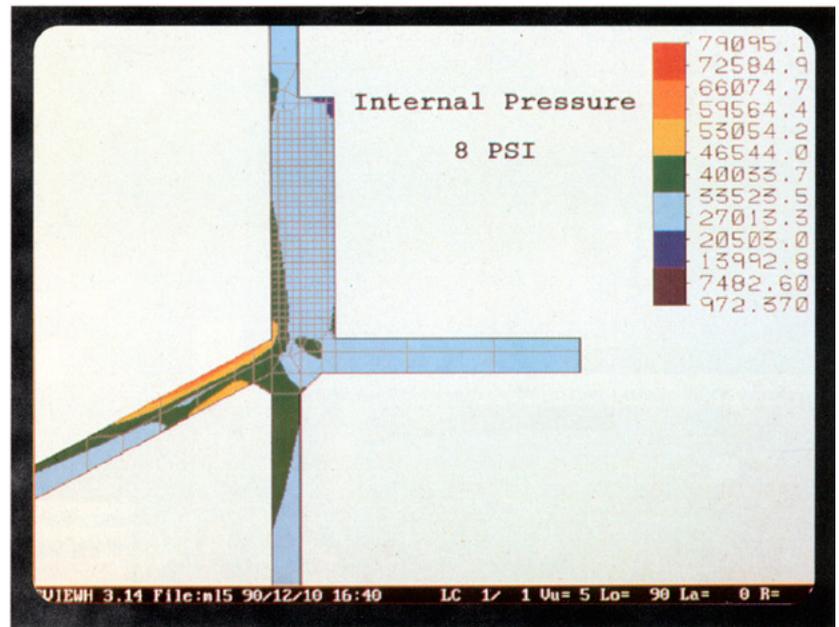
## Engineering

The engineering department of the Fabrication Division concentrates its efforts in three areas: the design of pressure vessels, thermal and mechanical design of shell-and-tube heat exchangers and refinement of customer-supplied designs for more practical and economic fabrication.

Most pressure vessels and heat exchangers are designed using ASME Code and TEMA rules where applicable. Using finite element analysis, we are also prepared to calculate stresses occurring in pressure vessel and heat exchanger structural details that do not match standard configurations covered by these rules.

The price-to-performance ratio for heat exchangers can be optimized using customer-supplied process conditions and our up-to-date heat transfer and pressure drop correlations.

Through its development of custom computer software, Alaskan Copper Works is efficiently able to draw upon years of experience to enhance the quality and cost effectiveness of its fabrication processes.



A portion of a pressure vessel with its stress pattern displayed by a finite element analysis. This method can calculate stresses for design details not covered by ASME Code or TEMA rules.



An experienced engineering staff is available to control design details of alloy fabrications made to demanding specifications.



# Heat Exchangers



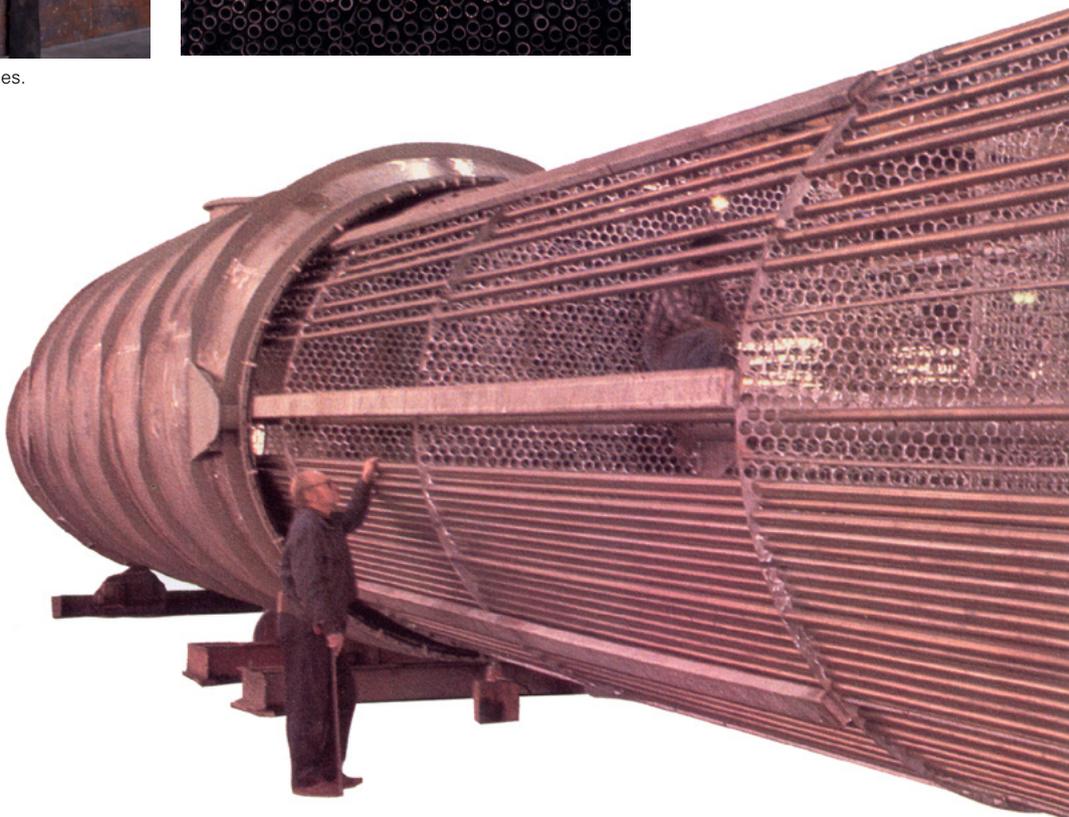
Segmental baffles used with two shellside passes.



Heat exchanger partially loaded with tubes.



Heat exchanger repair.



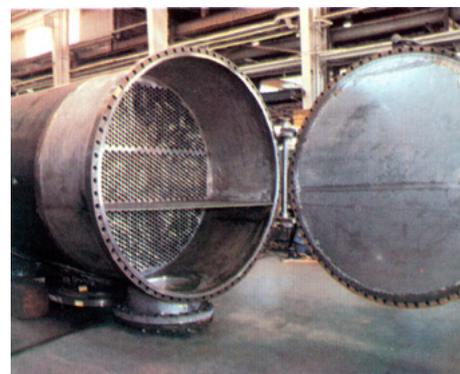
12 ft. diameter titanium tube bundle and baffle assembly before insertion in a stainless steel shell.



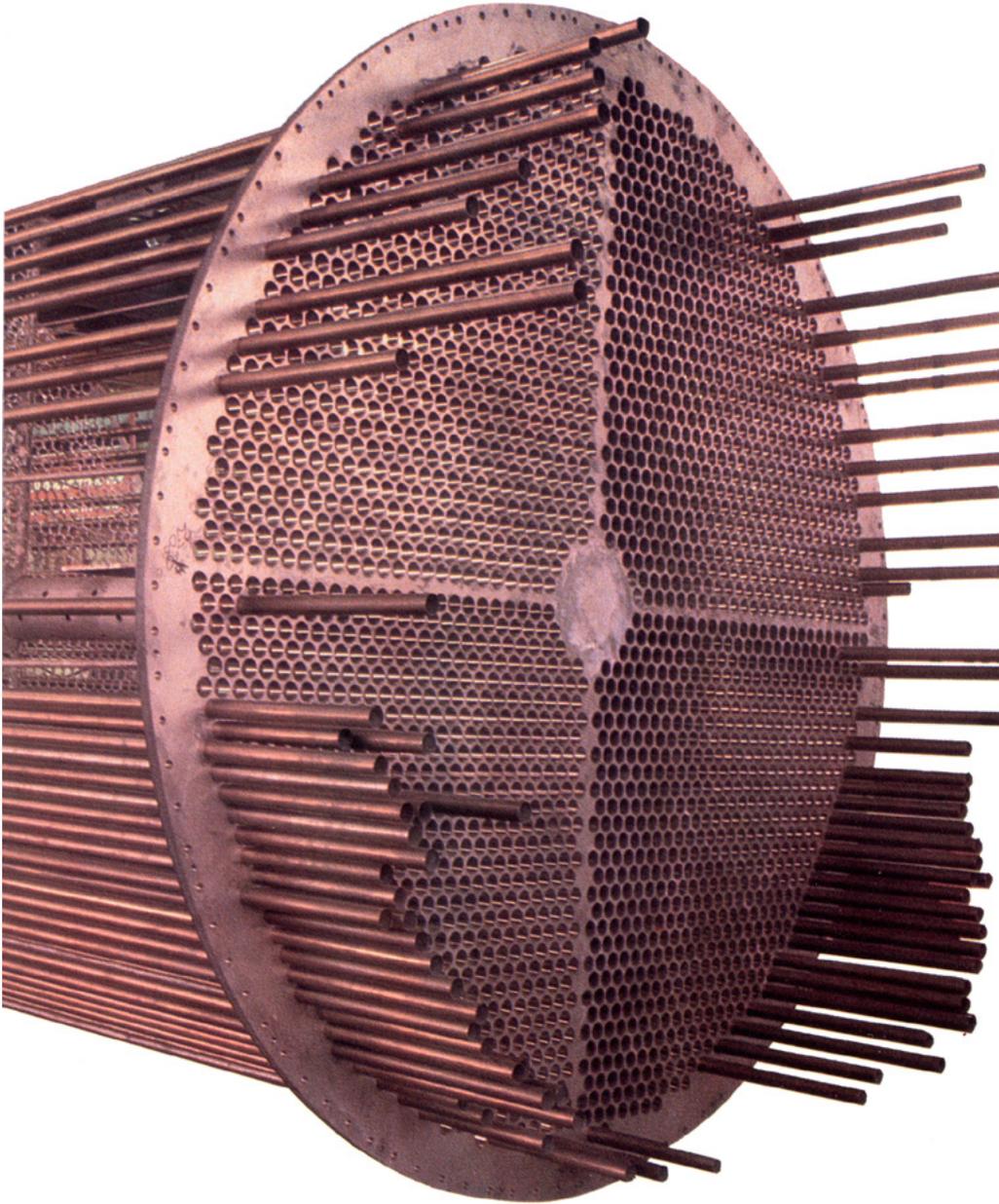
Nickel 200 8-pass, 4-shell heat exchanger.



2-pass, 2-shell heat exchanger.



Hinged channel cover of a multipass heat exchanger which can be manually opened.



Alaskan Copper Works for over 50 years has been a designer and fabricator of shell-and-tube type heat exchangers. Using customer-supplied process conditions and specifications, we configure heat exchangers to provide a balance between the most cost-efficient performance and initial cost of construction.

While Alaskan Copper Works specializes in designing and fabricating corrosion resistant heat exchangers, nearly all complete units include some carbon steel for external stiffening, supports or other miscellaneous requirements.

Repair service for heat exchangers is also available within our fabrication facilities. Our hydraulic tube-pulling equipment and extensive stock of alloy materials allow prompt refurbishing and return to service of heat exchangers in need of repair. Renewal of shells, retubing and nozzle repair can be a preferable alternative to the purchase of a new unit.



Stainless steel and titanium heat exchanger.



Heating element of a vapor recompression evaporator being carefully prepared for special shipment.

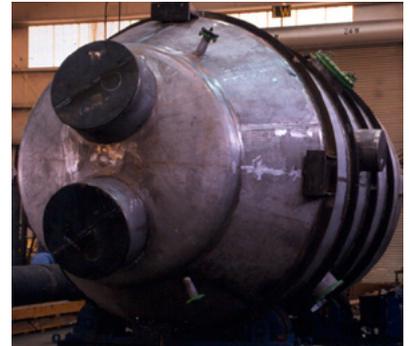
## Pressure Vessels, Tanks, Columns and Special Fabrications

Pressure containing vessels, including those subject to vacuum, are designed and fabricated to meet ASME Code requirements. Our fabrication capabilities are complemented by over 200 ASME qualified welding procedures which enable us to fabricate nearly all corrosion resistant alloys into Code products.

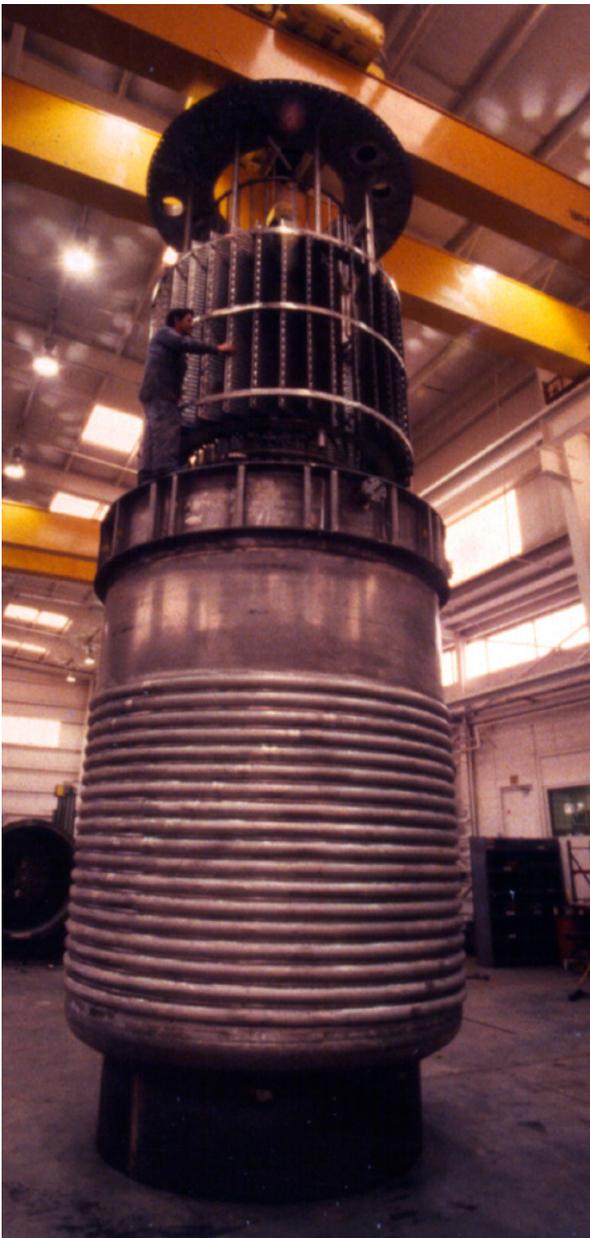
Our experience assures proper welding and fabrication techniques that maintain the full corrosion resisting performance of the alloys used.



Aluminum hydraulic tanks used in hydrofoil boats.



Stainless steel concentrator vapor head, over 11 ft. in diameter.



Stainless steel primary slurry tank used for producing plastics.



Stainless steel vacuum chamber used for free-electron laser experimentation.



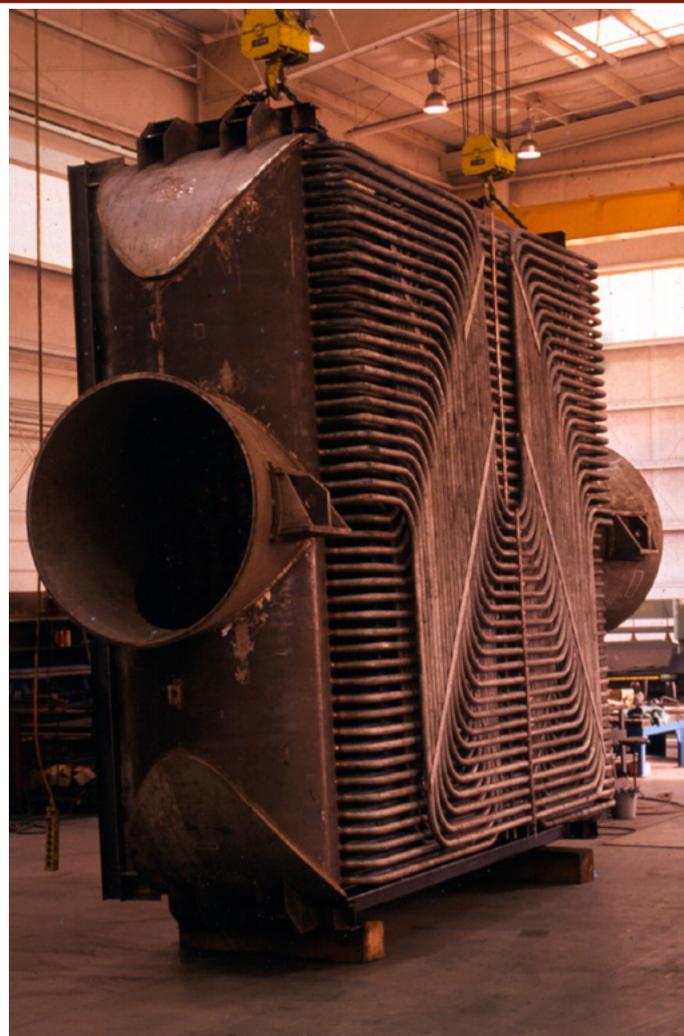
Stainless steel nitration system.



Aluminum wet pump pressure vessel used to transfer fish from a ship's hold to the dock.



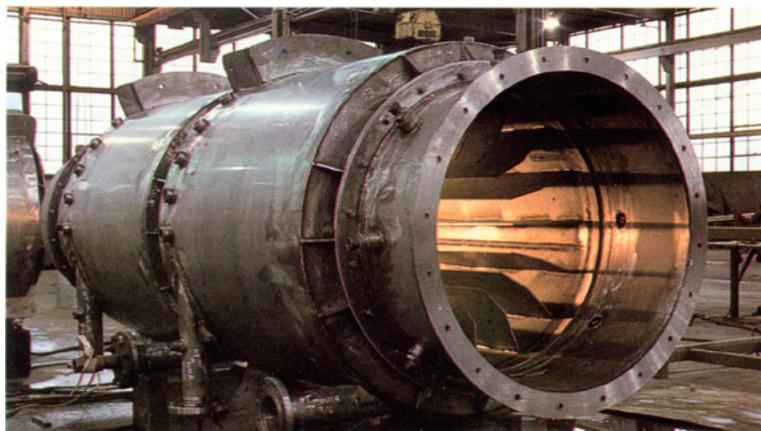
Stainless steel screw conveyors used for food processing.



Type 321 stainless steel natural gas-fired autoclave heat exchanger.

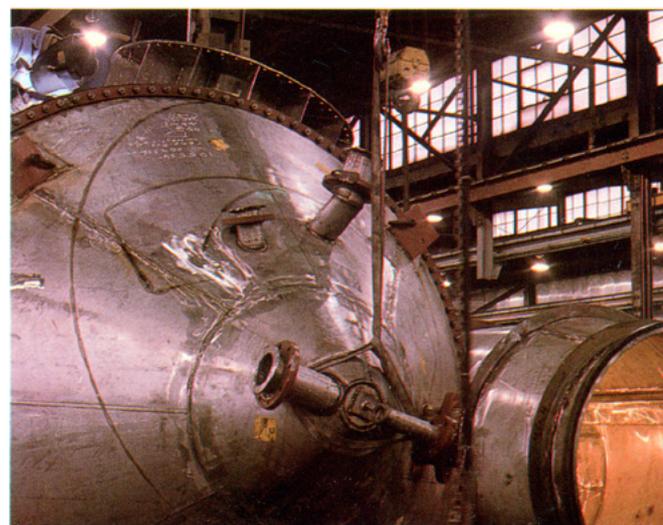


Coper-nickel pipe used in of-shore sulfur mining as a seawater supply line and pump shaft support.



Special stainless steel vessel.

Hastelloy C-276 pressure vessel.



## Prefabricated Piping Systems

Alaskan Copper Works throughout its history has manufactured pipe, fittings and flanges and prefabricated them into "spools" suitable for field assembly.

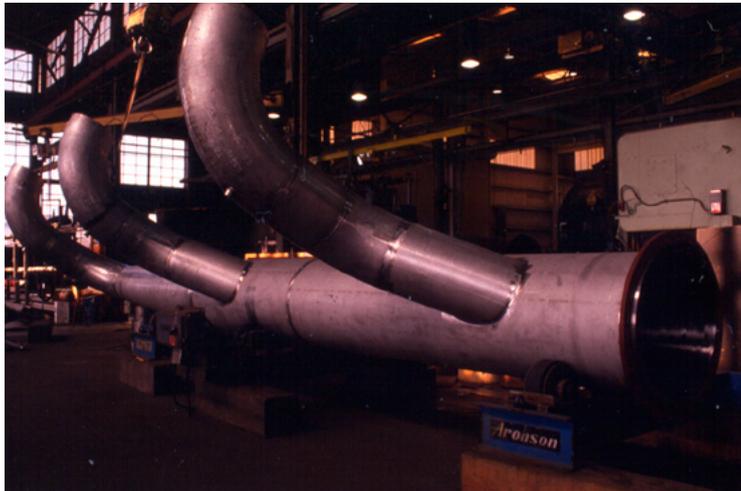
Today, along with its subsidiary, Stainless Piping Systems, Inc., the Fabrication Division provides an integrated program for supplying prefabricated piping in all corrosion resistant alloys. Beginning with the creation of spool sketches from customer-provided drawings, the many stages of piping prefabrication are efficiently managed to provide clearly identified pipe spools, properly protected for damage-free shipping.

Our project coordinators and experienced drafting staff determine a combination of fitting type and field weld placement to reduce field welding, thus shortening installation time as well as reducing overall cost.

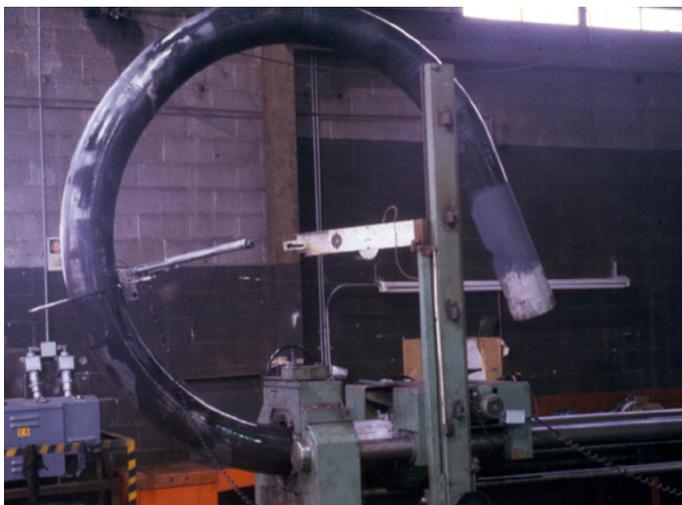
The Fabrication Division also has the capability to provide pipe bending in most sizes, wall thicknesses and centerline radii. All bends are produced wrinkle-free without the use of heat which can be harmful to the service performance of many corrosion resistant alloys.



Cotton-test finish on a section of a paper mill headbox piping system.



Piping header with polished internal surfaces.



A Roto-Bender bends pipe from 5" to 12" sizes and has the capability of producing wrinkle-free bends with the centerline radius as small as three times the outside diameter of the pipe.

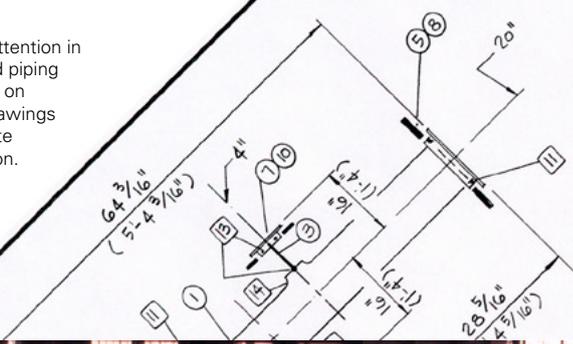


A vertical hydraulic press used to end large diameter pipe in sizes from 4" OD through 24" OD.



A welder attaching a piping section to a smooth-drawn tee outlet—a special feature of Alaskan prefabricated piping.

Our experience and attention in detailing prefabricated piping spool sketches based on customer-provided drawings help to assure accurate and efficient fabrication.



PRICING			UNIT	TOTAL
4	74	00		286 00
1	30	00		30 00
1	9	50		9 50
1	451	50		451 50
1	75	00		75 00
1	22	00		22 00
1	7	50		7 50
1	100	00		100 00
2	28	00		56 00
1	9	00		9 00
2	239	00		478 00
1	103	00		103 00
2	42	00		84 00
1	33	00		33 00
PIECE PRICE				\$ 1,924.00
TOTAL PRICE				\$ 1,924.00

SEATTLE, WA 98134 (206) 623-5800

**ALASKAN COPPER**  
*Works*

ALASKAN COPPER WORKS 25741

PIPING SYSTEMS, INC.  
CUSTOMER P.O. # P.O. #3610-107  
MK; W15-024-1 PER ACW NP-2773

Pipe fabrication labeling is automatically produced from job engineering information, allowing accurate identification at the jobsite.



Pipe prefabrication is efficiently performed in modern facilities.

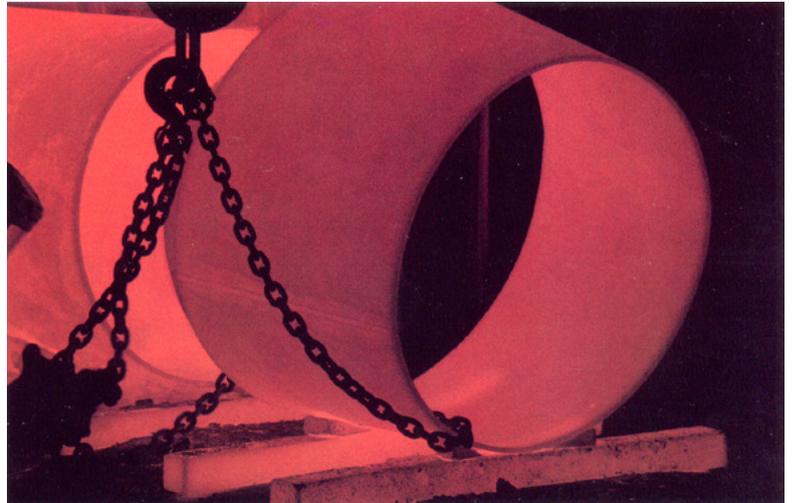
## Quality Control

Quality control is achieved through a program designed to get the right instructions to the right people, so the product is fabricated correctly the first time.

Alaskan Copper Works maintains documented quality control programs that meet the requirements of the ASME Code Section VIII, Division 1, Section III, Division 1, NCA-3800, 10CFR50 Appendix B and Military Specification MIL-I-45208A. These programs are continually analyzed, revised and improved to meet the increasing challenges and complexity of specifications for piping, fittings and custom fabrication.

Our current quality control programs require the assignment of responsibility and the maintenance of detailed procedures for engineering, drafting, layout, purchasing, scheduling, fabrication, examination, documentation and packaging.

The facilities at Alaskan Copper Works for radiography, liquid penetrant examination, ultrasonic gaging, hydrostatic testing and dimensional checking enhance the effectiveness of our quality control programs. Alaskan Copper Works currently holds an ASME Certificate of Authorization to manufacture products with either "U" or "UM" stamping in accordance with Section VIII, Division 1 of the Code.



Heat-treatment stress relieves fittings after forming.



Hydrostatic testing checks for leaks and structural integrity.



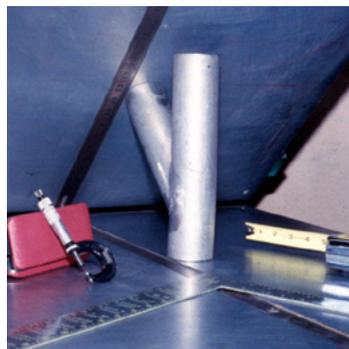
Radiographic inspection checks the integrity of welds.



Liquid penetrant examination locates hidden surface defects which may be too small to see visually.



A specialized film reader and digital densitometer are used in interpreting radiographic film.



Angle standard being used to check the geometric accuracy of prefabricated piping items.

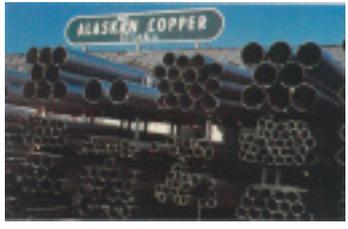
# ALASKAN

# Did You Know?

**ALASKAN COPPER**

**Alaskan Copper & Brass Company and Alaskan Copper Works are the nation's largest combination full service center and manufacturer of corrosion resistant alloy products.**

The following publications from Alaskan Copper & Brass Company and Alaskan Copper Works are available upon request.

	<p><b>• Mill Products Stock List</b> <i>Copper, Brass, Bronze, Aluminum and Stainless Steel Sheet, Plate, Bar, Pipe Tubing, Fittings and Flanges</i></p> <p>Fax (206) 382-7335    Portland, Oregon Fax (503) 238-6849    Vancouver, B.C. FAX (604) 937-0838</p>	<p><i>Alaskan Copper &amp; Brass Company</i></p> 
	<p><b>• Stainless Steel Piping Products</b> <i>Stainless Steel and Other Corrosion Resistant Metal Pipe, Flanges and Fittings</i></p> <p>Fax (206) 382-7346</p>	<p><i>Alaskan Copper Works Stainless Products Division</i></p> 
	<p><b>• Fabrication Division</b> <i>Corrosion Resistant Alloy Heat Exchangers, Pressure Vessels, Tanks, Columns, Special Fabrications and Prefabricated Piping Systems</i></p> <p>Fax (206) 382-4306</p>	<p><i>Alaskan Copper Works Fabrication Division</i></p> 
	<p><b>• Copper-Nickel Products</b> <i>Copper-Nickel Sheet, Plate, Bar, Pipe, Tubing, Fittings and Flanges</i></p> <p>Fax (206) 382-7335</p>	<p><i>Alaskan Copper Works</i></p> 
	<p><b>• Bosses and Welding Outlets</b> <i>Branch Outlets Available in Copper-Nickel, Nickel-Alloys, Stainless Steel and Other Corrosion Resistant Alloys</i></p> <p>Fax (206) 382-7335</p>	<p><i>Alaskan Copper &amp; Brass Company</i></p> 

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