

Northland Stainless, Inc.



www.northlandstainless.com

715-453-5326

Northland Stainless, Inc.

Total Control Ensures Total Quality



20 Acres of land, 65,000 Sq. Ft. Production Space - Since 1973

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Mission Statement

Northland Stainless, Inc. is committed to being the premier fabricator in our industry. Utilizing continuous improvement to meet or exceed the expectations of our customers, providing quality products in a timely manner at a fair price.

NSI At A Glance

Thank you for your interest in Northland Stainless, Inc. As you read this brochure, we are confident you will develop an appreciation of the qualities that make us a preferred supplier to many acknowledged Fortune 500 companies.

Some of the reasons why firms choose NSI:

- The 30+ years of experience we possess serving the Chemical, Pharmaceutical, Biotechnology, Defense, Paper, Food, Beverage and Dairy industries.
- The ability we have to meet clients most sophisticated technical requirements and delivery schedules.
- The open communication we maintain with clients during all project phases.
- The skilled workforce that incorporates the highest levels of engineering technology, superb craftsmanship and consistent quality into every product we design and fabricate.

Taking a closer look, you will find many more reasons why you will want NSI to custom fabricate your processing equipment. If you are looking for satisfaction and a supplier you can trust, you will be glad that you discovered Northland Stainless, Inc.

NORTHLAND STAINLESS, INC.

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SAMUEL MANU-TECH INC.

Our Commitment To Quality And Service

Engineering



Manufacturing



Customer Satisfaction



Quality Assurance



Finishing

Pharmaceutical & Biotechnology Industry



Buffer Preparation Tank - 3000L

NSI has gained vital experience meeting the challenges of this specialized industry by building on our core qualities of custom fabrication, strict quality assurance and focused customer service.

These core qualities enable us to develop procedures for manufacturing corrosion-free vessels with design attributes such as high-purity sterile surfaces, operator-friendly manway assists and 100% drainage.

Understanding that product integrity is crucial to our customers, we employ a comprehensive documentation program that validates every component used. Customers can rely on us to provide verifiable accounting of their project at any step in the design and fabrication process.



WFI Storage Tank - 65,000L



Fermentation Vessel - 150L



Pharmaceutical & Biotechnology Industry



Charge Tank 450 Gallon



Portable Process Vessel - 200L



Media Preparation Tank - 12,000L



Harvest Tanks - 12,000L

Other Industries Served



Horizontal WFI Surge Tank



45" Dia. x 20' Long Digester Tubes



Volume Production 2, 5, 10 and 15 Gallon Pressure Pots

NSI serves any industry that requires corrosion-resistant, sanitary, or high nickel alloy custom fabrication.

Industries Served

- Pharmaceutical
- Chemical
- Biotechnology
- Food and Beverage
- Paper
- Defense
- Ethanol
- Cryogenics
- Dairy
- Process System Integrators



Shell & Tube Heat Exchangers

Product Scope

- Reactors
- Pressure Vessels
- Heat Exchangers
- Fermenters
- Evaporators
- Digesters
- Storage Tanks
- Screw Conveyors
- Portable Batch Equipment
- V Blenders
- Tank Components



36" Dia. Nutsche Filter



The NSI engineering staff combines materials and project specifications to cost-effectively design custom products. This requires precise engineering, meticulous planning and continued analysis throughout the design process.

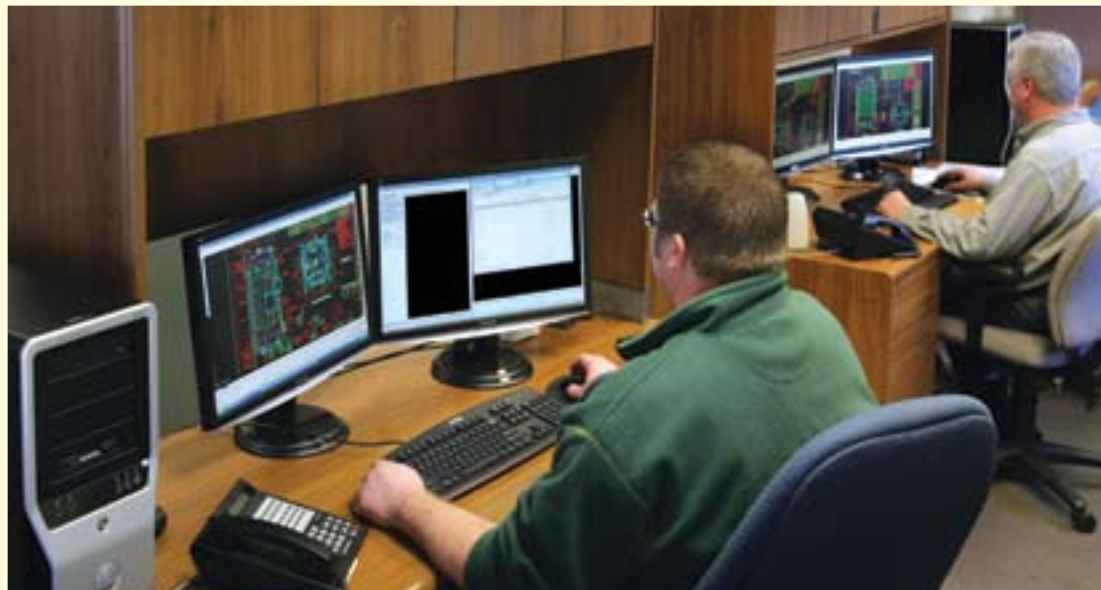
Each project is subjected to a thorough evaluation of the client's operation requirements, specifications, material required technical data and related industry and governmental regulations before we present the optimal design and fabrication package. Projects are closely monitored during fabrication with schedule and progress updates communicated to the customer.

NSI's sustained capital investment provides state-of-the-art engineering technology and computer-aided design and modeling services. We utilize electronic data transfer to optimize communication between project engineers and customers.

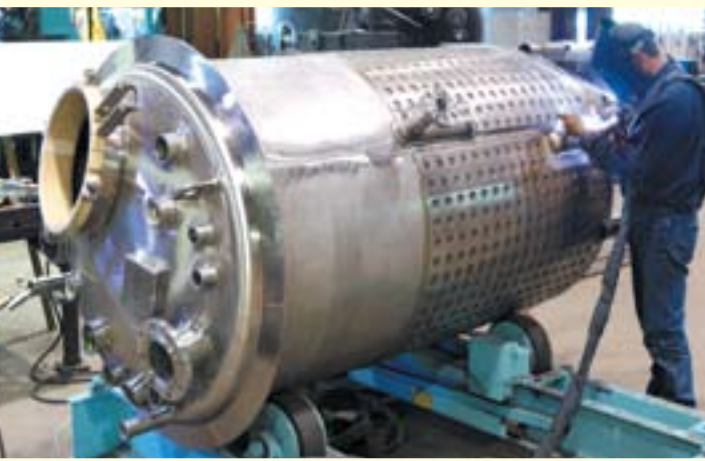


Vessel or Process Equipment Attributes

- **Pressure or Vacuum**
- **Durable**
- **Reliable**
- **Sealing**
- **Sterile Surfaces**
- **Corrosion Resistant**
- **Bacteria Resistant**
- **Cleanability**
- **100% Drainage**
- **Agitation**
- **Vessel Heat Transfer**



Manufacturing



Application of Dimple jacket



Installation of 165° Half Pipe
with Guaranteed 100% Weld Penetration

Northland Stainless is a fully integrated fabricator. We design and build most major components and complete all required finishing and testing processes in our facility. This allows us to manufacture a wide range of standard and custom pressure vessels and processing equipment more efficiently and cost-effectively while maintaining the highest quality.

We have the flexibility to produce volume runs, develop specialized manufacturing processes, and meet strict delivery timelines. We understand the critical nature of business interruptions at our customer's facilities and are prepared to quickly respond to customers' emergency requirements.

Our workforce takes great pride in the craftsmanship of the product we create and is dedicated to quality assurance and customer satisfaction. We employ the best technology, fabricating equipment and fully trained and certified team members. Our attention to detail extends to proper packaging for secure delivery.



Horizontal Storage (Lethal Service) Tanks 30,000 Gal Each



NSI Views Electropolishing As "A Science and an Art"

NSI has developed technology and expertise in mechanical surface finishing to 2-3 Ra levels. This detailed surface preparation is essential to the electropolishing process.

Electropolishing is a process that removes surface metal and impurities by submerging the mechanically polished surface in an electrolytic bath and applying a measured balance of electric current.

The science of electropolishing recognizes the effect caused by the different removal rates of elements of the metal being polished. Based on their atomic weight, iron and nickel atoms are more easily removed from the surface than chromium atoms. This preferential removal of free iron and nickel results in a surface layer of corrosion-resistant chromium oxides. Along with an ultra-smooth finish, this phenomenon produces the important property of passivation on the electropolished surface.

The "art" of electropolishing is understanding how the length of time in the bath, the flow of the current, the proper chemical solution and temperature all contribute to achieve the desired Ra surface finish.

The end result is the superior release qualities necessary to prevent contamination and ensure a bacteria-resistant surface.



Electropolish System



Head Manufacturing



Cold Forming Press 300 Ton

NSI has a fully integrated head manufacturing facility that utilizes two distinct technologies – Cold Forming and Hydroforming.

Recent investment in a computer-controlled 300-ton cold forming press reduces cycle time and results in product consistency. The flanger processes up to 3/4" stainless with great uniformity and speed.



Flanger

Head Forming Capabilities



| ASME | Flanged & Dished |
|-----------------|------------------|
| 10 - 14GA | 14" - 96" Dia. |
| 3/16" - 3/4" PL | 12" - 168" Dia. |



| Standard | Flanged & Dished |
|-----------------|------------------|
| 10 - 14GA | 14" - 100" Dia. |
| 3/16" - 3/4" PL | 12" - 168" Dia. |



| 80% - 10% | Flanged & Dished |
|-----------------|------------------|
| 3/16" - 3/4" PL | 16" - 168" Dia. |



| Shallow | Flanged & Dished |
|-----------------|------------------|
| 10 - 14GA | 14" - 130" Dia. |
| 3/16" - 3/4" PL | 16" - 168" Dia. |



| Dished Only | |
|-----------------|-----------------|
| 10 - 14GA | 14" - 100" Dia. |
| 3/16" - 3/4" PL | 10" - 130" Dia. |



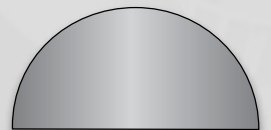
| Flanged Only | |
|-----------------|-----------------|
| 7 - 14GA | 14" - 144" Dia. |
| 3/16" - 1/2" PL | 14" - 168" Dia. |



| Reverse Dished & Flanged | |
|--------------------------|----------------|
| 7 - 14GA | 14" - 72" Dia. |
| 3/16" - 3/8" PL | 18" - 66" Dia. |



| 2:1 Elliptical | |
|-----------------|----------------|
| 3/16" - 3/4" PL | 18" - 96" Dia. |



| Hemispherical | |
|-----------------------|--|
| Up to 1/2" - 60" Dia. | |



| Flanged Cone | |
|---------------------------------------|--|
| Cone sizes vary due to design of cone | |



Head Manufacturing



One of the largest hydroforming presses in the US, our 1000-ton press uses water pressure to form round, elliptical or even square shapes. This unique process produces heads and other components that are free of any residual stress, avoiding distortion in any further processing.

The tooling costs for hydroformed products are generally 10-20% of the initial investment required for traditional stamping methods which makes this process ideal for medium quantity orders (under 1000 units per month). Equipment setup time is also reduced enabling rapid changeovers and consistent on-time delivery.

By hydroforming gauge material from 16" to 100" in diameter and cold forming plate material (up to 3/4") from 12" to 168" in diameter, we are in the best position to offer our customers more variety of design options, more attractive pricing and super-responsive turnaround times.



Hydroforming Press 1,000 Ton



3 Axis Plasma Cutter



State-of-the-Art Automated Welding Equipment

Components



CIP Spray Ball Assemblies



Orbital Welder



Vessel Head with Manway, Agitator, Lifting Lugs, Nozzles.

Northland Stainless manufactures every component we can to ensure the finest end results over each project we undertake. We make heads, manways, heat transfer surfaces, pipe coils 165° and true 180° half pipe that fit and function. Total control of the manufacturing process has also enabled us to develop several advanced product designs such as sanitary manways.

Other components such as vortex breakers and baffle plates that need to be inside the vessel are provided. Lifting lugs are provided on tanks and vessels to insure safety and ease of handling. Customers can choose from a full range of heat transfers surfaces including dimpled jacket, 165° and true 180° half pipe or any variation of conventional jacketed tanks.



Pressure Manway and Manway Assist



Quality Control - Documentation



Commitment to Excellence

At NSI, we realize the necessity of complete documentation detailing each project and understand our responsibility in maintaining accurate records to prove product integrity throughout the manufacturing process. Every member of our staff is aware of the role they have in preserving precise and verifiable documentation.

Quality Control Documentation

- **FAT (Factory Acceptance Test)**
- **GMP (Good Manufacturing Practice)**
- **Complete Documentation for Validation (Standard or Custom per Clients Requirements)**
- **Weld Procedures (WPS)**
- **Weld Maps & Logs**
- **Dye Penetrant and X-Ray Log**
- **Passivation Procedure/Certification**
- **Electropolishing Procedure/Certification**
- **Saline Procedure/Report**
- **Hydrostatic Testing Procedure/Report**
- **CIP (Riboflavin) Procedure/Report**
- **Surface Finish Test/ Map/Certification**
- **Code Data Reports**
- **Mill Test Reports (MTR), Certificates of Compliance, Material Log**
- **Required Calculations (pressure, temperature, seismic, wind load)**
- **Component catalog cut sheets, spare parts list, operation and maintenance manuals**
- **Positive Material Identification**
- **Ultrasonic Welding Integrity Tests**

Quality Control - Testing



Ra Test to Confirm Surface Finish Compliance



BoreScope to View Internal Welds

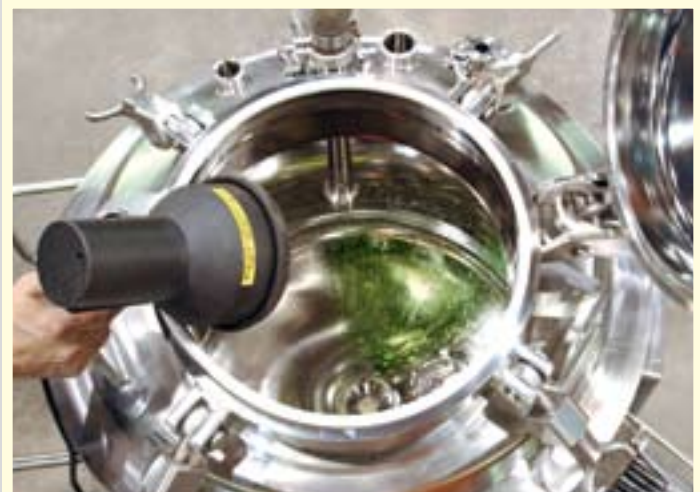
NSI has a comprehensive Quality Assurance program that encompasses detailed documentation, frequent equipment calibration and testing, and ongoing training and certification of employees.

Every product is rigorously tested to insure weld quality and surface finish required for:

- Product Purity
- Product Integrity
- Contamination Free
- Sanitary
- Ultra High Purity
- Cleanability
- 100% Drainage

Testing Instrumentation

- Oxygen Sensor
- Profilometer
- Mass Spectrometer
- Orbital Welding with Electronic Reporting
- Video Tape of Test and Procedure
- Borescope with VHS or Disc



Riboflavin Test to Validate CIP Coverage



Customer Satisfaction

Testimonials

The surest sign of a successful project is a satisfied customer. Northland Stainless Inc.'s commitment to customer satisfaction has earned us many positive comments from our customers, a few of which are included below:

"I would like to take this opportunity to thank the team at Northland Stainless for the outstanding results achieved in the quick fabrication testing, and delivery of the two 58 gallon bump tanks to our facility. The excellent result achieved by the Northland Stainless team has allowed our plant to minimize costly downtime. The demonstrated dedication and selfless commitment of the Northland Stainless team on this project is what separates World Class Suppliers from the rest of the pack."

A major pharmaceutical company.

"The project has been successful to date. That is due to your efforts and deliveries. I fully anticipate that the project will finish in outstanding fashion. I sincerely thank you for your work and support. It has been my pleasure to work with you."

A major engineering firm working on a Biotech project.

"I would like to express my appreciation for the fine performance of your company, Northland Stainless, Inc., in responding to an urgent need for fabrication of a 2,500 gallon stainless steel hydrogen peroxide tank to support the start of a project at a nuclear power plant. This code stamped tank was required to be completed and shipped within two weeks of receipt of the order. Your company responded to our needs in an excellent manner following through on every detail to ensure quality and on-time completion. Additionally, the craftsmanship of your workers was very much in evidence when a tour of your facility was conducted in conjunction with a inspection of the tank by our company. The fit and finish of the tanks and components you produce for the pharmaceutical industry must be described as extraordinary."

A leading supplier to the nuclear industry

"We would like to thank your group for the quick response in terms of repairing our pulp mill digester tube. We did not incur any loss of production during the repair time. It is a pleasure to work with a group such as yours in times of need to achieve common goals. It is relations such as ours that make us leaders in business."

A nationwide paper company.

Closing Thoughts

We hope you have gained an appreciation of what sets Northland Stainless, Inc. apart from other fabricators and vessel suppliers. We believe that we offer a unique combination of small-company attention to detail and customer service and big-company capabilities, processes, and technologies.

We encourage you to contact us with any questions or comments you may have for us regarding how NSI can become your partner in success!

Qualifications

Materials

Stainless Steel 304, 304L, 316, 316L and 317L, Duplex 2205, 254SMO™ and 2507 Aluminum, Titanium, Hastelloy™, Inconel™, Monel™, AL6XN™, Alloy 20

Approved for Code Work

ASME Section VIII-Div 1, Section IX
Stamps U, R, UL, Mil I 45208A
API-650, FDA, 3-A

Qualified Welding Procedures

GMAW P-8, P-43, P-44, P-45
GTAW P-8, P-42, P-43, P-44, P-45, P-51, P-10H
SAW P-8, P-44, P-45, P-10H
PAW P-8, P-43, P-44, P-45
Orbital Welding BPE code

Testing/Inspection

X-Ray, Dye Penetrant, Ultrasonic, Hydrostatic to 4500 psi, Helium Gas Test, Riboflavin, RA Finish, Borescope, Saline Test, PMI

Polishing/Passivation

Mechanical: to 2-3 RA
Electropolish: to 2-3 RA
Passivation: Citric, Nitric, Phosphoric

Vessel Sizing

Lift: 40 tons, 28'-0" clear under hook
Diameter: 18'-5" x Length - 100'-0"
Thick: to 4"
Shear: 3/8" x 10'-0" Stainless
Plasma Cut: 1" Thick
Roll: 1/2" Thick x 144" Wide
Design Pressure: +3,000 psi to Absolute Vacuum
Design Temperature: +1,500°F to -320°F



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PRESSURE VESSEL GROUP

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