Industrial Linings, Inc.

8475 Bellingrath Road PO Box 190580 Mobile, AL 36619
Phone: 251-653-5052 Fax: 251-653-7367 Toll Free: 800-350-0795

Quality Assurance Manual

Fiberglass Reinforced Plastics

CONTROLLED COPY

Table of Contents

Lifting Lugs Inspection Report
Manufacturing Checklist
Non-conformance Report
Nozzle Inspection Report
Pipe Fabrication Checklist
Support Lugs Inspection Report
Support Rings Inspection Report
Vessel Inspection Report
Shipping Release

Section A: GENERAL

1.0 Purpose

To establish a quality assurance program for manufacturing of fiberglass reinforced plastic products and equipment.

2.0 Scope

This manual describes the methods and techniques for assuring the quality of equipment FRP manufactured and fabricated by Industrial Linings, Inc.

3.0 Quality Policy

All employees of Industrial Linings, Inc. are expected to strive to completely satisfy the customer's needs. We are committed to delivering products, services, as well as technical information that will meet or exceed the requirements and expectations of all our customers. As our business relationship grows with our customers, each customer will be assured of consistent performance from all our employees.

4.0 Applicable Specifications and Standards

ASTM C581 Standard Practice for Determining Chemical Resistance of Thermosetting Resins Used in Glass-Fiber-Reinforced Structures Intended for Liquid Service
ASTM C582 Standard Specification for Contact-Molded Reinforced Thermosetting Plastic (RTP) Laminates for Corrosion-Resistant Equipment
ASTM D2310 Standard Classification for Machine-Made Fiberglass (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe
ASTM D2517 Standard Specification for Reinforced Epoxy Resin Gas Pressure Pipe and Fittings
ASTM D2562 Standard Practice for Classifying Visual Defects in Parts Molded from Reinforced Thermosetting Plastics
ASTM D2563 Standard Practice for Classifying Visual Defects in Glass-Reinforced Plastic Laminate Parts
ASTM D2924 Standard Test Method for External Pressure Resistance of Fiberglass (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe
ASTM D2992 Standard Practice for Obtaining Hydrostatic or Pressure Design Basis for Fiberglass (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe and Fittings
ASTM D2996 Standard Specification for Filament-Wound Fiberglass (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe
ASTM D3299 Standard Specification for Filament-Wound Glass-Fiber-Reinforced Thermoset Resin Corrosion-Resistant Tanks
NBS PS 15-69 Voluntary Product Standard for Custom Contact-Molded Reinforced-Polyester Chemical-Resistant Process Equipment

Section B. INSPECTION PROCEDURES: GENERAL

1.0 Purpose

To communicate the responsibilities and functions of personnel involved with Quality Assurance and Control

2.0 Application

Applies to Quality Assurance personnel and those areas that are responsible for manufacturing a product to specific standards

3.0 Definitions

A. Quality Assurance Manager:
The Manager is responsible for overseeing and directing work under the guidelines of the Quality Assurance Manual

B. Shop Managers:
Shop Managers are responsible for directing production and insuring quality control in the respective areas

C. Area Leader Man:
Area Leader Man is responsible for heading a group of workers in accomplishing productive and quality acceptable goals

Section C. DEPARTMENT OF QUALITY ASSURANCE

1.0 Engineering

The Engineering Department will follow these "Quality Policies and Objectives" as standard requirements:

a. That all designs will be reviewed to ensure that the materials and dimensions specified will meet the customer's specification
b. That all manufacturing methods will allow the specifications to be met
c. That no changes in the design are made during production without Engineering's approval
d. That all applicable drawings/prints are updated and controlled to assure production has the latest revision
e. Develop the necessary procedures to implement these objectives

2.0 Material Control

The Materials Control Manager will follow these "Quality Policies and Objectives" as standard requirements:

a. Identify and thoroughly inspect all incoming materials to assure that specifications are met
b. Tag all materials
c. Identify special materials based on special projects or products according

d. Tag defective material and remove from non-defective material storage to prevent

e. accidental usage
f. Work with the Quality Assurance Manager to determine whether or not materials are usable or must be rejected
g. Develop the necessary procedures to implement these objectives

3.0 Production Manager

The Production Manager will follow these "Quality Policies and Objectives" as standard requirements:

a. Control all applicable drawings/prints issued to their department to ensure that the latest revision is received and earlier revision are removed
b. Ensure each production worker inspects work already complete prior to beginning new task to uncover errors or non-conformance
c. Ensure supervisors have performed recorded inspection of all work completed prior to final inspection by Quality Assurance Manager
d. Cease production of any product when non-conformance because apparent
e. Develop the necessary procedures to implement these objectives

4.0 Shipping (Post Production)

The Shipping (Post Production) Department will follow these "Quality Policies and Objectives" as standard requirements:

a. No product will be loaded for shipment without completed inspection by Quality Assurance Manager
b. No product will be released for shipment without completed Loading Inspection report
c. Appropriate loading and off loading procedures and equipment must be used and be available in all product shipments and/or deliveries
d. Develop the necessary procedures to implement these objectives

5.0 Quality Assurance

The Quality Assurance Manager will follow these "Quality Policies and Objectives" as standard requirements:

a. Advise and coordinate with all departments in development, as well as execution of all "Quality Policies and Objectives"
b. Resolve any conflict that may exist between procedures and objectives developed or executed by each quality department
c. Ensure that all practices are being followed by each department
d. Ensure that all specifications are met through inspections and documentation
e. Develop the necessary procedures to implement these objectives

Section D. INSPECTION PROCEDURES: QUALITY ASSURANCE

1.0 Purchased Materials

A. All incoming materials will be stored separate from in-stock materials until they have been inspected and passed the receiving inspection
B. All materials that are rejected will be clearly tagged and separated from accepted materials and returned to the vendor
C. No incoming materials will be used until they have passed the receiving inspection
D. The receiving inspection will include, but is not limited to the following:
    - verify that received materials match the assigned purchase order
    - check of the shelf life to verify that is in within the date recommended by the manufacturer
    - identify and document the type of material
    - identify and document the manufactured date
    - identify and document lot and batch number
    - identify and document date received
    - identify and document any shipping damage

1.1 Purchased Material Control

A. As purchased materials come in, the Shop Manager will property tag and date materials
B. Dated purchased materials will be listed on the Material Certification Sheets
C. All purchased materials will be properly stored in accordance with the manufacturer's recommended practices

2.0 Molds

A. All molds will be built to meet all customer or engineering specifications, requirements, and drawings
B. All molds will be inspected to ensure they are clean, smooth, and properly coated prior to use

3.0 Sub-Assembly Part (FRP heads, bottoms, and shell(s))

A. All production materials and procedures will be inspected and evaluated to insure that they were followed as stated on work order and all applicable specifications
B. All production techniques used will be inspected and evaluated to insure that they did not result in any defects, includes mold and equipment inspection
C. All production materials will be inspected and evaluated to insure that the required thicknesses were achieved
D. All production materials will be inspected and evaluated to insure that they are clearly tagged with the job number to ensure proper use
E. All production materials will be documented as inspected
F. All production materials that are rejected will be clearly tagged as such

4.0 Filament Winding

A. All production materials and procedures will be inspected and evaluated to insure that they were followed as stated on work order and all applicable specifications
B. All production techniques used will be inspected and evaluated to insure that they did not result in any defects, includes mold and equipment inspection

C. All production materials will be inspected and evaluated to insure that the required thicknesses were achieved
D. All production materials will be inspected and evaluated to insure that they are clearly tagged with the job number to ensure proper use
E. All production materials will be documented as inspected
F. All production materials that are rejected will be clearly tagged as such

5.0 Component Parts

A. All production materials and procedures will be inspected and evaluated to insure that they were followed as stated on work order and all applicable specifications
B. All production techniques used will be inspected and evaluated to insure that they did not result in any defects, includes mold and equipment inspection
C. All production materials will be inspected and evaluated to insure that the required thicknesses were achieved
D. All production materials will be inspected and evaluated to insure that they are clearly tagged with the job number to ensure proper use
E. All production materials will be documented as inspected
F. All production materials that are rejected will be clearly tagged as such

6.0 Cure

A. Acetone sensitivity and barcol hardness test will postponed at least (24) hours to allow adequate cure time
B. Barcol hardness readings will be obtained randomly
C. All inspection results will be documented

7.0 Hydrostatic Test (if required by customer)

A. Any products subject to a Hydrostatic Test will be clearly tagged during production
B. Hydrostatic Test will be completed prior to final inspection
C. Hydrostatic Test data will be documented

8.0 Loading and Documentation

A. No product will be loaded until the final inspection has been completed and is released by the Quality Assurance Manager
B. All products loading supports and tie-down procedures must comply with any applicable specifications and/or Industrial Linings, Inc. standards set by the Quality Assurance Manager
C. No load will depart our facility without the Bill of Lading being signed by and authorized quality assurance representative

Section H. INSPECTION PROCEDURES: COATINGS

1.0 Purchased Materials

All coating materials will be checked for the following:

A. Shipping damage (punctures, broken lid seal)
B. Proper identification (type, manufacture date, batch number)
C. Within shelf life recommended by the manufacturer

1.1 Purchased Materials Control

A. As coating materials come in, the Shop Manager will property tag and date materials
B. Dated coating materials will be listed on the Material Certification Sheets
C. All coating materials will be properly stored in accordance with the manufacturer's recommended practices

2.0 Surface Preparation

A. Any contaminates will be removed from the surface using clean oil-free brushes, filtered compressed air, water or vacuuming
B. Surfaces that are not be coated are to be adequately protected from the coating procedures

3.0 Coating Material Preparation

A. All coatings will be mixed in accordance with the manufacturer's written instructions

4.0 Coating Application

A. Prior to application, the surface to be coated will be clean
B. The application method used shall be in accordance with the manufacturer's written instructions
C. Temperature, humidity, and dew point will be monitored and will be within the range indicated by the manufacturer's written instructions
D. A dry film thickness test will be conducted to insure that the proper mils have been achieved
E. If the minimum thickness is not achieved, additional coats will be applied in accordance to the manufacturer's written recoating instructions

5.0 Handling and Curing of Coatings

A. After each coat the minimum and maximum curing times before recoating will conform to the manufacturer's written instructions
B. Equipment will be protected from condensation, contamination and weather until coating has cured for exterior exposure
C. Equipment will not be moved, loaded for shipment, or shipped until the coating has cured, except as necessary in turning for coating and drying purposes

6.0 Coating Final Inspection

Prior to calling Quality Assurance for final inspections, the Shop Manager will insure the following has been properly performed:

A. All checklists are properly documented (see checklist for required items to be checked)
B. All non-conformance documents are complete

Section I. INSPECTION PROCEDURES: FINAL

A. After all equipment is complete and assembled, the Quality Assurance Manager will be called for a final inspection
B. The Quality Assurance Manager will:

1. Review all quality assurance documentation
2. Review all non-conformance reports
3. Issue a shipping release
4. Retrieve all documentation and place it in the customer main file

Section J. SHIPPING PROCEDURE

After a shipping release is issued from the Quality Assurance Manager, each Shop Manager will insure that all equipment is loaded and/or packaged properly for shipping

Section K. COMPUTER TECHNOLOGY

1.0 Administration

A. Work Order Processing and Control
    1. After an order is placed, a work order is entered into our database system
    2. Each work order created will contain the following information:
        a. A unique work order ID number
        b. A unique work order number
        c. Customer shipping information
        d. Customer purchase order number
        e. Customer requested shipping dates
    3. Work orders are then reviewed with the Quality Assurance Manager and the appropriated Shop Manager
    4. Work orders will be tracked through our database to insure that the shipping dates required are met
B. Purchasing Order Processing and Control
    1. All purchase orders will be entered into our database system
    2. Purchase orders relating to a specific work order will be referenced to that work order for material/purchasing control
    3. Purchase orders will be tracked through our database to insure prompt delivery dates
C. Digital Pictures
    1. After each work order is completed, digital pictures will be taken prior to and after equipment is loaded for shipment, the pictures will then be stored in our database and referenced to the work order
    2. All repair work that is received will have digital pictures taken before, during and, after the repair work

FRP INSPECTION – WHAT TO LOOK FOR

Cracks
Usually caused by dropping the equipment or a sharp blow to the exterior of the equipment. If a gouge or deep scratch is present on the exterior, look inside at that point for a crack

Crazing - *fine surface cracks*
Usually caused by dropping something inside of the equipment or stripping the equipment off the mandrel before a proper cure is attained

Blisters – *round elevations of the laminate surface over bubbles*
Over catalyzed resin and not properly rolling out the laminate are the major causes

Wrinkles – *waviness in laminate*
Caused by improperly rolling out the laminate

Pits – *craters in the laminate surface*
Caused by improperly wetting out mold before applying laminate and improperly rolling of the laminate

Surface porosity – *pinholes or pores in the laminate surface*
Caused by not wetting mold properly before applying laminate and not rolling out the laminate properly

Chips – *piece broken at the edge or the surface*
Caused by dropping or a blow to the equipment

Dry spot – *non-wetted reinforcement*
Caused by improper wet out of the laminate or water damage to the reinforcing mat

Entrapped air – *bubbles in the laminate*
Improper agitation of the resin or improper rolling out of the laminate

Exposed glass – *burrs of loose fibers*
Caused by improperly rolling out of the laminate or improper clean up of the equipment prior to gel coated

ACCEPTANCE CRITERIA

Defect	Surface Inspected	
	Process Side	***Non-process Side***
Cracks	None	None
Crazing	None	Maximum dimension ½" 5 ft^2, Minimum 2" apart
Blisters	None	Maximum ¼" diameter x 1/8" high, Maximum 1 ft^2, Minimum 2" apart
Wrinkles	Maximum deviation 20% of wall thickness, but not exceeding 1/8"	Maximum deviation 20% of wall thickness, but not exceeding 1/8"
Pits	Maximum 1/8" diameter x 1/16" deep Maximum 10 ft^2	Maximum 1/8" diameter x 1/16" deep Maximum 10 ft^2
Surface Porosity	None	None
Chips	None	Maximum of break ¼" and thickness no greater than 20% of wall thickness Maximum density
Dry Spots	None	Maximum dimension 2 in^2
Entrapped Air	1/16" diameter x 10 in2, but none to a depth of 1/32"	1/8" diameter x 4 in ft^2 1/16" diameter x 10 in^2
Exposed Glass	None	None
Scratches	None	Maximum length = 1" Maximum depth = .010"

Industrial Linings, Inc.

8475 Bellingrath Road PO Box 190580 Mobile, AL 36619
Phone: 251-653-5052 Fax: 251-653-7367 Toll Free: 800-350-0795

BAFFLE INSPECTION REPORT

Sales Order #:		Customer:		PO #:							
Equipment:											
Inspection Date:		Reference DWG:									
Orientation:											
Length											
Width											
Inches off wall											
Gussetts											
Overlay Thickness											

Technician: _____ Date: _____

Representative: _____ Date: _____

Industrial Linings, Inc.

8475 Bellingrath Road PO Box 190580 Mobile, AL 36619
Phone: 251-653-5052 Fax: 251-653-7367 Toll Free: 800-350-0795

BARCOL HARDNESS CERTIFICATION

Sales Order #: _____ Customer: _____ PO #: _____

Equipment: _____ Date: _____

Resin Tested: _____ Thickness: _____ Liner: ☐ "C" Veil ☐ Nexus Required Barcol: _____

Test Results

Area Tested	Hardness Reading

Comments: _____

_____

_____

_____

_____

_____

Technician: _____ Date: _____

Representative: _____ Date: _____

Test Equipment Used:

Barcol Hardness Barber Coleman Company Model # GYZJ 934.1

Industrial Linings, Inc.

FITTINGS CHECKLIST

Sales Order #		Customer:		DWG:	
Description:					
Resin Type:		Barrier:		Structure	
Catalyst System:	☐ MEKP	☐ Cobalt	☐ DMA	☐ BPO	☐ Cumene	☐ Furan

Mark #	1	2	3	4	5
Size/Diameter					
Fitting Type	☐S ☐E ☐R ☐T	☐S ☐E ☐R ☐T	☐S ☐E ☐R ☐T	☐S ☐E ☐R ☐T	☐S ☐E ☐R ☐T
S – Stub Flange E – Elbow R – Reducer T – Tee					
Inside Barrier	☐ C ☐ N	☐ C ☐ N	☐ C ☐ N	☐ C ☐ N	☐ C ☐ N
Design Thickness					
Actual Thickness					
Tagged	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

CODES	1 – None	2 – Minor, acceptable	3 – Major rework	4 – Rejected

Description	**Code**	**Code**	**Code**	**Code**	**Code**
Cleanup	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐
Flange Flat Face	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐
Drilling	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐
Bolt Holes Coated	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐
Fractures	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐
Blisters	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐
Pitts	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐
Air	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐
Dry Veil	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐
Scratches	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐
Checked By					
Date					
Laminator:					

Shop Manager **Date**

QA Administrator **Date**

Industrial Linings, Inc.

8475 Bellingrath Road PO Box 190580 Mobile, AL 36619
Phone: 251-653-5052 Fax: 251-653-7367 Toll Free: 800-350-0795

FLANGE INSPECTION REPORT

Sales Order #:			Customer:			PO #:					
Equipment:											
Inspection Date:			Reference DWG:								
Mark #											
Size											
Bolt Circle											
Bolt Hole Size											
No. of Holes											
Flange Thickness											
Pipe Wall Thickness											
Stub Length											
Spot Faced											
Flange Flatness											
Holes Gel Coated											
Gussetts											

Technician: _____ Date: _____

Representative: _____ Date: _____

Industrial Linings, Inc.

8475 Bellingrath Road PO Box 190580 Mobile, AL 36619
Phone: 251-653-5052 Fax: 251-653-7367 Toll Free: 800-350-0795

HOLD DOWN LUGS INSPECTION REPORT

Sales Order #:		Customer:		PO #:							
Equipment:											
Inspection Date:		Reference DWG:									
Type:	☐ CS ☐ SS ☐ GS ☐ FRP	Orientation:									
CS – Carbon Steel SS – Stainless Steel GS – Galvanized Steel FRP – Fiberglass Reinforced Plastic											
Orientation											
Length											
Width											
Bolt Hole											
Bolt Circle											
Thickness of Material											
Overlay Thickness											
Overlay Width											

Technician: _____ Date: _____

Representative: _____ Date: _____

Industrial Linings, Inc.

8475 Bellingrath Road PO Box 190580 Mobile, AL 36619
Phone: 251-653-5052 Fax: 251-653-7367 Toll Free: 800-350-0795

HYDRO-STATIC TEST CERTIFICATION

Sales Order #: _____ Customer: _____ PO #: _____

Equipment: _____

Materials Tested: _____ Test Date: _____

I hereby certify that a hydro-static test was conducted on _____ at a pressure rating of _____ and was held for a period of _____ and no leaks were detected at the time of this test.

Comments: _____

Technician: _____ Date: _____

Representative: _____ Date: _____

Industrial Linings, Inc.

8475 Bellingrath Road PO Box 190580 Mobile, AL 36619
Phone: 251-653-5052 Fax: 251-653-7367 Toll Free: 800-350-0795

LAMINATE INSPECTION REPORT

Sales Order #:			Customer:			PO #:					
Equipment:											
Inspection Date:			Reference DWG:								
Laminate Complete											
Head											
Bottom											
Shell											
Shell											
Shell											
Stiffners											
Nozzles											
Support Rings											
Hold Down Lugs											
Lifting Lugs											

Laminate Quality	**Fractures**	**Blisters**	**Pits**	**Air**	**Exposed Glass**	**Scratches**	
Head							
Bottom							
Shell							
Shell							
Shell							
Stiffners							
Nozzles							
Support Rings							
Hold Down Lugs							
Lifting Lugs							
Code: 1 – None; 2 – Minor; 3 – Repair; 4 - Reject							

Technician: _____ Date: _____

Representative: _____ Date: _____

Industrial Linings, Inc.

8475 Bellingrath Road PO Box 190580 Mobile, AL 36619
Phone: 251-653-5052 Fax: 251-653-7367 Toll Free: 800-350-0795

LIFTING LUGS INSPECTION REPORT

Sales Order #:		Customer:		PO #:							
Equipment:											
Inspection Date:		Reference DWG:									
Type:	☐ CS ☐ SS ☐ GS ☐ FRP	Orientation:									
CS – Carbon Steel SS – Stainless Steel GS – Galvanized Steel FRP – Fiberglass Reinforced Plastic											
Orientation:											
Length											
Width											
Bolt Hole											
Thickness of Material											
Overlay Thickness											
Overlay Width											

Technician: _____ Date: _____

Representative: _____ Date: _____

Industrial Linings, Inc.

PIPE MANUFACTURING CHECKLIST

Sales Order #		Customer:		DWG:	
Description:					
Resin Type:		Barrier:		Structure	
Catalyst System:	☐ MEKP	☐ Cobalt	☐ DMA	☐ BPO	☐ Cumene ☐ Furan

Run #	1	2	3	4	5
Size/Diameter					
Length					
Construction Method	☐ HL ☐ FW	☐ HL ☐ FW	☐ HL ☐ FW	☐ HL ☐ FW	☐ HL ☐ FW
Barrier	☐ C ☐ N	☐ C ☐ N	☐ C ☐ N	☐ C ☐ N	☐ C ☐ N
Design Thickness					
Actual Thickness					
Gel Coat	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Tagged	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Mylar Removed	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

CODES	1 – None	2 – Minor, acceptable	3 – Major rework	4 – Rejected

Description	**Code**	**Code**	**Code**	**Code**	**Code**
Cut Line	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐
Fractures	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐
Blisters	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐
Pitts	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐
Air	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐
Dry Veil	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐
Scratches	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐	1 ☐ 2 ☐ 3 ☐ 4 ☐
Checked By					
Date					
Area Foreman:					

Shop Manager **Date**

QA Administrator **Date**

Industrial Linings, Inc.

NON-CONFORMANCE NOTICE

Sales Order #		Customer:	
Description:			
Inspection Area:	☐ Manufacturing	☐ Fittings	☐ Fabrication
Discrepancy(s):			
Comments:			
Checked By			
Date			
Area Foreman:			

Shop Manager **Date**

QA Administrator **Date**

Industrial Linings, Inc.

8475 Bellingrath Road PO Box 190580 Mobile, AL 36619
Phone: 251-653-5052 Fax: 251-653-7367 Toll Free: 800-350-0795

NOZZLE INSPECTION REPORT

Sales Order #:		Customer:		PO #:							
Equipment:											
Inspection Date:		Reference DWG:									
Mark #											
Size											
Orientation											
Elevation											
Project											
Level											
Gussetts											
Inside Joint											
Outside Joint											
Installed By											

Technician: _____ Date: _____

Representative: _____ Date: _____

Industrial Linings, Inc.

PIPE FABRICATION CHECKLIST

Sales Order #		Customer:		DWG:	
Description:					
Spool Number:		Size/Diameter:			
Orientation:					
Dimensions:					
Resin Type:	ResinType	Inside Weld:		Outside Weld:	
Catalyst System:	☐ MEKP	☐ Cobalt	☐ DMA	☐ BPO	☐ Cumene	☐ Furan

CODES	1 – None	2 – Minor, acceptable	3 – Major rework	4 – Rejected

Description	Code	Checked By	Date	Comments
Weld Type: ☐ BW ☐ SW ☐ LW	1 ☐ 2 ☐ 3 ☐ 4 ☐			
Inside Weld	1 ☐ 2 ☐ 3 ☐ 4 ☐			
Outside Weld	1 ☐ 2 ☐ 3 ☐ 4 ☐			
Inside Barrier: ☐ C ☐ N	1 ☐ 2 ☐ 3 ☐ 4 ☐			
Inside Width	1 ☐ 2 ☐ 3 ☐ 4 ☐			
Outside Width	1 ☐ 2 ☐ 3 ☐ 4 ☐			
Outside Thickness	1 ☐ 2 ☐ 3 ☐ 4 ☐			
End Capped	1 ☐ 2 ☐ 3 ☐ 4 ☐			
End Cap Sequence	1 ☐ 2 ☐ 3 ☐ 4 ☐			
Air	1 ☐ 2 ☐ 3 ☐ 4 ☐			
Drainage	1 ☐ 2 ☐ 3 ☐ 4 ☐			
Burrs	1 ☐ 2 ☐ 3 ☐ 4 ☐			
Blisters	1 ☐ 2 ☐ 3 ☐ 4 ☐			
Gel Coat: ☐ Yes ☐ No	1 ☐ 2 ☐ 3 ☐ 4 ☐			

Fabricated By:	
Welded By:	

Shop Manager **Date**

QA Administrator **Date**

Industrial Linings, Inc.

8475 Bellingrath Road PO Box 190580 Mobile, AL 36619
Phone: 251-653-5052 Fax: 251-653-7367 Toll Free: 800-350-0795

SHIPPING RELEASE

Sales Order #:		**Customer:**		**PO #:**	
Carrier:					
Document Type:	☐ Freight Bill ☐ Delivery Ticket				
Order Completed	☐ Yes ☐ No	**Tags Required**	☐ Yes ☐ No		
Packing List Required	☐ Yes ☐ No	**Billing Info**	☐ Prepaid ☐ Collect ☐ Third Party		
Est. Total Shipping Wt.	LBS				

# of Packages	Type of Package	Description	Estimated Weight	Hazardous
	☐ Pallet ☐ Carton ☐ Crate ☐ Box ☐ Loose			☐ Y ☐ N
	☐ Pallet ☐ Carton ☐ Crate ☐ Box ☐ Loose			☐ Y ☐ N
	☐ Pallet ☐ Carton ☐ Crate ☐ Box ☐ Loose			☐ Y ☐ N
	☐ Pallet ☐ Carton ☐ Crate ☐ Box ☐ Loose			☐ Y ☐ N
	☐ Pallet ☐ Carton ☐ Crate ☐ Box ☐ Loose			☐ Y ☐ N
	☐ Pallet ☐ Carton ☐ Crate ☐ Box ☐ Loose			☐ Y ☐ N
	☐ Pallet ☐ Carton ☐ Crate ☐ Box ☐ Loose			☐ Y ☐ N
	☐ Pallet ☐ Carton ☐ Crate ☐ Box ☐ Loose			☐ Y ☐ N
	☐ Pallet ☐ Carton ☐ Crate ☐ Box ☐ Loose			☐ Y ☐ N
	☐ Pallet ☐ Carton ☐ Crate ☐ Box ☐ Loose			☐ Y ☐ N

Pictures Taken?	☐ Yes ☐ No	**Load Checked?**	☐ Yes ☐ No

Shop Manager ______________________________ **Date:** ______________
Signature Required

QA Manager ______________________________ **Date:** ______________
Signature Required

Industrial Linings, Inc.

8475 Bellingrath Road PO Box 190580 Mobile, AL 36619
Phone: 251-653-5052 Fax: 251-653-7367 Toll Free: 800-350-0795

SUPPORT LUGS INSPECTION REPORT

Sales Order #:			Customer:			PO #:					
Equipment:											
Inspection Date:			Reference DWG:								
Orientation											
Elevation											
Projection											
Thickness											
Height											
Width											
Bolt Hole											
Bolt Circle											
Overlay Thickness											
Overlay Width											

Technician: _____ Date: _____

Representative: _____ Date: _____

Industrial Linings, Inc.

8475 Bellingrath Road PO Box 190580 Mobile, AL 36619
Phone: 251-653-5052 Fax: 251-653-7367 Toll Free: 800-350-0795

SUPPORT RINGS INSPECTION REPORT

Sales Order #:			Customer:				PO #:				
Equipment:											
Inspection Date:				Reference DWG:							
Elevation											
Ring Width											
Ring Thickness											
Gussetts											
Overlay Thickness											
Overlay Width											

Technician: _____ Date: _____

Representative: _____ Date: _____

Industrial Linings, Inc.

8475 Bellingrath Road PO Box 190580 Mobile, AL 36619
Phone: 251-653-5052 Fax: 251-653-7367 Toll Free: 800-350-0795

VESSEL INSPECTION REPORT

Sales Order #:		Customer:			PO #:						
Equipment:											
Inspection Date:		Reference DWG:									
Head Type:	☐ Flat ☐ Std, F&D ☐ ASME, F&D ☐ 2:1 Elliptical ☐ Conical without transition										
Bottom Type:	☐ Flat ☐ Std, F&D ☐ ASME, F&D ☐ 2:1 Elliptical ☐ Conical without transition										
Support Type, if applicable:	☐ Skirt ☐ Legs ☐ Lugs										
Stiffeners	☐ Yes ☐ No			Baffles:	☐ Yes ☐ No						
Nozzles	☐ Yes ☐ No			Support Ring:	☐ Yes ☐ No						
Hold Down Lugs:	☐ Yes ☐ No	Qty		Type:	☐ CS ☐ SS ☐ GS ☐ FRP		Orientation:				
Lifting Lugs:	☐ Yes ☐ No	Qty		Type:	☐ CS ☐ SS ☐ GS ☐ FRP		Orientation:				
	CS – Carbon Steel SS – Stainless Steel GS – Galvanized Steel FRP – Fiberglass Reinforced Plastic										
Construction Method:	☐ Hand Lay Up ☐ Filament Wound										
Diameter:				Height:							
Resin Type:			Barrier:			Structure:					
Catalyst System:	☐ MEKP	☐ Cobalt	☐ DMA	☐ BPO	☐ Cumene	☐ Furan					

Technician: _____ Date: _____

Representative: _____ Date: _____