

شناسه فرم: PU-FR-005/03						شرکت آهن و فولاد غدیر ایرانیان						فرم ارزیابی تأمین کنندگان محصول/خدمات					
نام تأمین کننده:												تاریخ ارزیابی:					
شماره آگهی / قرارداد :												شرح مناقصه :					
ارزیاب : کمیته فنی / بازرگانی																	
ردیف	عوامل کیفی	عوامل تدارکاتی	معیار ارزیابی	وزن	امتیاز از ۲۰						وزن * امتیاز						
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A:
B:
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یادآوری ۱: کمیته فنی و بازرگانی پیش از ارزیابی تأمین کنندگان بایستی مدارک و مستندات هر یک از سوالات مذکور را از تأمین کنندگان اخذ نماید.

یادآوری ۲: حداقل امتیاز لازم حسب شرایط و نوع خرید میتواند متفاوت باشد .

امضاء اعضای کمیته:

Consultant  ASYN STEEL ENGINEERING	IRANIAN GHADIR IRON & STEEL COMPANY DIRECT REDUCTION PLANT					Client  شرکت آهن و فولاد غدیر ایرانیان Iranian Ghadir Iron & Steel Co.	
Client Code				Rev	04	Date:	09/24/2025
Designer code			Document name:	Enquiry Document For Top Gas Scrubber Mist Eliminator			

ENQUIRY DOCUMENT FOR TOP GAS SCRUBBER MIST ELIMINATOR (SR-XA46 / SR-XA47)

FOR

IRANIAN GHADIR IRON & STEEL COMPANY

04	IFA	09/24/2025	ASE	ASE	ASE
03	IFA	09/18/2025	ASE	ASE	ASE
02	IFA	09/14/2025	ASE	ASE	ASE
01	IFA	08/31/2025	ASE	ASE	ASE
00	IFR	08/26/2025	ASE	ASE	ASE
Rev.	Purpose of Issue	DATE	Prepare	Check	Approve

Consultant 	IRANIAN GHADIR IRON & STEEL COMPANY DIRECT REDUCTION PLANT					Client  شرکت آهن و فولاد غدیر ایرانیان Iranian Ghadir Iron & Steel Co.
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Revision Record Sheet:

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01	x	x	x	x	x	
02	x	x	x	x	x	
03	x	x	x	x	x	
04	x	x	x	x	x	
05	x	x	x	x	x	
06	x	x	x	x	x	
07	x	x	x	x	x	
08	x	x	x	x	x	
09	x	x	x	x	x	
10	x	x	x	x	x	
11	x	x	x	x	x	
12	x	x	x	x	x	
13	x	x	x	x	x	
14	x	x	x	x	x	
15	x	x	x	x	x	
16	x	x	x	x	x	
17	x	x	x	x	x	
18	x	x	x	x	x	
19	x	x	x	x	x	
20	x	x	x	x	x	
21	x	x	x	x	x	
22	x	x	x	x	x	
23	x	x	x	x	x	
24	x	x	x	x	x	
25	x	x	x	x	x	
26	x	x	x	x	x	
27	x	x	x	x	x	
28	x	x	x	x	x	
29	x	x	x	x	x	
30		x	x	x	x	
31		x	x	x	x	
32		x	x		x	
33			x		x	
34						
35						
36						
37						
38						
39						
40						

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1. Introduction

The top gas scrubber is a packed-bed evaporative cooler. The hot, dust-laden top gas first enters the upper venturi section, where it contacts swirl water and throat sprays. At the venturi throat the gas is largely cooled and the larger particulates are captured by the water. From the venturi the gas rises into a packed bed, where it is further cooled and washed by spray nozzles. The cleaned flow is then split into two streams; each stream passes through a cyclone mist eliminator before exiting the scrubber.

This inquiry concerns dust and mist removal equipment of Top Gas Scrubber for Iranian Ghadir Iron & Steel Company, located near ARDAKAN city in Yazd Province. Based on the description below, special attention must be given to the engineering, design, and supply of Top Gas Scrubber Mist Eliminators, and evaluation of dust-removal performance of Top Gas Scrubber Venturi, **Packing and related spray nozzles**. Mist eliminators shall be designed and manufactured for continuous outdoor operation, 24 hours per day, 360 days per year in specified climate.

Required site information will be obtained from the process design data document attached. All technical requirements in attached documents shall be reviewed and confirmed before tender submission.

Item	Tag	Description	Basic Engineering	Detail Engineering	Supply	Erection	Supervision
1	SR-A45	Top Gas Scrubber (Throat & Swirl, Venturi)	√	√	-	-	√
2	SR-A46	Top Gas Scrubber Process Gas Mist Eliminator	√	√	√	-	√
3	SR-A47	Top Gas Scrubber Fuel Gas Mist Eliminator	√	√	√	-	√

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2. Technical Specification

2.1. Top Gas Scrubber

The hot, dust-filled top gas initially enters the upper venturi, where it encounters swirling water and throat sprays. At the venturi throat the gas is substantially cooled and larger particles are captured by the liquid. The gas then rises into a packed section, where spray nozzles further cool and wash it. Vendor is supposed to recheck top gas scrubber Throat, Swirl, venturi, packing and related spray nozzles and submit modified drawing.

2.2. Top Gas Scrubber Cyclone Mist Eliminator

The present enquiry includes both design and manufacturing of two cyclone-type mist eliminators for top gas scrubber process and fuel gas. the process and fuel gas mist eliminators use cyclonic action to separate the liquid and solid particles from the gas streams. The wet gas enters the side of the vessel through a tangential nozzle the gas swirls around the outside wall causing the water particles to contact the wall and run down to the drain below. The gas is disengaged from the water by turning 180 degree and discharging through the top outlet nozzle. For structural design, test, etc. the ASME codes must be referred.

Unit body shall be designed, fabricated and tested in accordance with ASME code for unfired pressure vessels, section-VIII derision 1. Internal part of equipment shall be accessible by suitable manhole or flanges.

Necessary inspection and maintenance holes shall be provided. Material shall be carbon steel designed for the pressures and temperatures indicated. Lifting lugs shall be provided on equipment and/or base to facilitate unloading, erection, and maintenance. Equipment shall be provided with drain, vent connections and drain valve. Respective support shall be provided for equipment.

All parts and components should be standard and catalogue item unless approved by the purchaser. Permanent, non-rusting metal tags or name plates shall be affixed to major components, auxiliary equipment, and instruments with item or tag numbers. Item or tag numbers will be provided by the Purchaser.

The designer shall design in such a way that the current input and output positions (x,y,z) are not changed.

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Fig.01 Top Gas Scrubber Cyclone Mist Eliminator

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2.3. Design and Operational Conditions

2.3.1. Top Gas Scrubber

Inlet Gas Dust Load (mg/Nm ³)	10,000
Outlet Gas Dust Load (mg/Nm ³)	100
Average Collection Efficiency	99%
Operating Pressure Drop Across Scrubber (mmH ₂ O)	1,000

Detail Drawing of Top Gas Scrubber and Venturi Shall be obtained from document attached.

2.3.2. Gas and Water Specification (as per PFD)

Top Gas (Line 1)

Flow	264,320	Nm ³ /hr
Temperature	435	°C
Pressure	0.4	bar g

Composition:

CO	18.9	%
CO ₂	15.1	%
H ₂	33.9	%
H ₂ O	26.3	%
CH ₄	3.8	%
C ₂ H ₆	0.00	%
C ₃ H ₈	0.00	%
C _n H _m	0.00	%
N ₂	2.0	%

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Process Gas Out Scrubber (Line 2)

Flow	153,440	Nm ³ /hr
Temperature	50	°C
Pressure	0.25	bar g

Composition:

CO	23.18	%
CO ₂	18.47	%
H ₂	41.57	%
H ₂ O	9.67	%
CH ₄	4.66	%
C ₂ H ₆	0.00	%
C ₃ H ₈	0.00	%
C _n H _m	0.00	%
N ₂	2.45	%

Top Gas Fuel Out Scrubber (Line 3)

Top Gas Flow	68,992	Nm ³ /hr
Temperature	40	°C
Pressure	0.25	bar g

Composition:

CO	24.13	%
CO ₂	19.24	%
H ₂	43.29	%
H ₂ O	5.93	%
CH ₄	4.85	%
C ₂ H ₆	0.00	%
C ₃ H ₈	0.00	%
C _n H _m	0.00	%
N ₂	2.55	%

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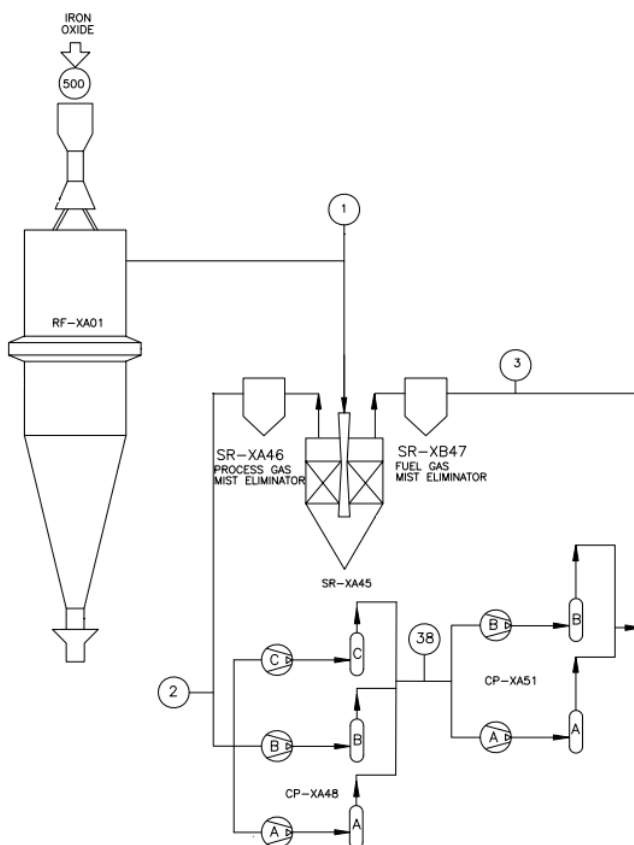


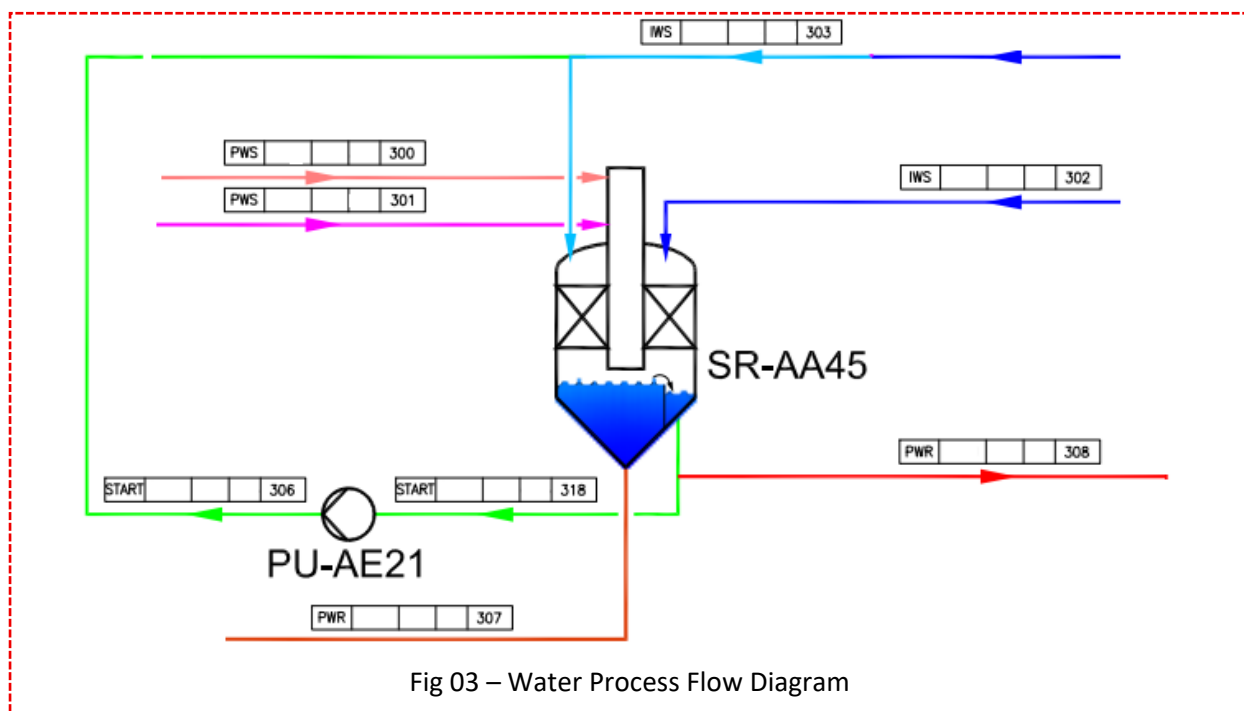
Fig 02 – Gas Process Flow Diagram

Line Number		303	302	300	301	308	307	318
Stream		Top Gas Scrubber Process Packing	Top Gas Scrubber Fuel Packing	Top Gas Scrubber Venturi Throat	Top Gas Scrubber Venturi Wall	Top Gas Scrubber Weir Drain	Top Gas Scrubber Cone Drain	Hot Water to Recycle Pump
Flow 150 t/h	m ³ /h	1010	500	170	170	1789	2	650
Temperature	C	45	34	56-59	56-59	67	67	66.5
Pressure (Design)	Kg/Cm ²	1.64	1.47	3	2	0.1	0.1	0.5
Total Suspended Solid	PPM	50	50	50	50	1223	14213	50

Table 01 – Water Specification

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EC	TDS	TSS	TH	CaH	MgH	Cl-	P-ALK	M-ALK
μs/cm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
3063	1991	49.5	311	214	97	865	0	243

Table 02 – Process Water Quality

2.3.3. Cyclone Mist Eliminator Operational figure:

Outside diameter:	Shall be specified by vendor
Total length:	Shall be specified by vendor
Material:	body: A516 Gr70
Turn down ratio	0.5
Max. Pressure drop	0.060 bar g
Vessel Design pressure	Shall be specified by vendor
Efficiency:	
Cyclone Separator Shall Remove 80% of 10-micron particles.	

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2.3.4. Additional Properties

Moisture Content:	water (existing) – oil (not existing)
Water pH Value:	Approx 7.8
Dust Loading:	(-500 U.S. mesh)
Corrosion allowance	2 mm for shell, heads

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3. Scope of Work and Supply

1. Engineering (calculation & design)
2. Supply of the fully fabricated equipment according to design drawings
3. Material supply regarding the following requirements:
 - All the materials used shall be new and conform to the respective specifications given on drawings
 - Major materials shall have prior approval of the client or its representative. Any deviation is subject to the client or its representative approval.
4. The vessel shell and heads shall be carbon steel, designed and constructed per the ASME boiler and pressure vessel code, section VIII, DIV.1, and latest edition.
5. The design must prevent re-entrainment of particle after separation.
6. Supplier shall provide lifting lugs for shipping and handling during erection.
7. Subcontracting of any part of the order shall be subject to the written approval of the client or its representative.
8. Name plate
9. Drain valve
10. Mating flanges and its bolts and nuts and gaskets shall be supplied by manufacturer even if they have not mentioned in the drawings
11. All flanges should be standard parts. To ease installation of gaskets and establishing a firm connection, raised face type flanges with 1.5 mm thickness shall be used even they have not mentioned in the drawings. (Supplier will consider that the total length of element will be remaining constant when the raised face is added to the flange).
12. All bolts, nut, washer and gasket.
13. All instruments and safety devices
14. Special tools. (if any)
15. Preparation and supply of spare parts list for 2-years safe operation (the spare parts shall be packed separately)
16. Davit for manholes
17. Nozzles for level device
18. Taps on inlet and outlet for measuring differential pressure

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19. Performance examination of the Top Gas Scrubber and its equipment and accessories in cleaning and dust removal of process gas and Top gas fuel is included in the contractor's scope of work. Moreover, the Modified detailed drawing shall be submitted. Following review of the relevant drawings and a site visit, the specifications and performance of at least the following items must be examined:

- Venturi, Throat and Swirl nozzles
- Packing and Spray Nozzles
- Process and Top Gas Fuel Cyclone Separators

The contractor's scope of work is not limited to the items listed above; a complete scope of work must be submitted in the technical proposal.

20. Supplier's responsibilities shall include, but are not limited to the followings:

- Coordinating and resolving all engineering problems related to equipment design, manufacturing, testing and installation.
- Compliance with the provisions of this inquiry does not relieve the supplier of the responsibility for furnishing equipment and accessories of proper design, mechanically suited to meet operating guarantees.

21. Documentation according to Section 5

22. Performing tests and inspections according to Section 6

23. Application of surface protection according to Section 7

24. Packing and delivery to site according to Section 8

25. Guarantee as per Section 9

26. Required quantity: 1(one) set as required.

27. All supports, manways and accessories shall be detailed for input data to civil for platform design.

28. Weight and corresponding load for each separator shall be specified by vendor for input data to steel structure design.

29. Vendor shall be reported the calculation for inlet/outlet nozzle size and vessel diameter due to droplet removal.

30. Pressure differential transmitter shall be considered at each mist eliminator.

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4. Standards and Codes

The following standards are or should be applied to the design work:

1. DIN
2. AWS
3. ASME
4. ASME B16.5, B16.47 FOR FLANGES
5. ANSI / API
6. API 615: noise
7. OHSA: safety
8. Designer's standards
9. JIS
10. ASTM

The following standards are or should be applied to the material:

1. ASTM
2. DIN (DIN-EN 10025)

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5. Documentation

5.1. Documents to be presented before contract:

- Time Schedule for all activities including engineering, material procurement, shop fabrication, tests and inspections, painting, packing and delivery
- Prior approval of source of supply / manufacturer
- Statement of the Supplier's related experience
- Price list for main equipment
- Price list for two years operation spare parts
- Reference list
- Relevant catalogues
- Storage procedure
- Welders' qualification / certificate
- Quotation summery sheet
- Deviation list (if any)
- Certificates for quality management system

5.2. Documents to be presented after contract:

- Material Certificate
- W.P.S. (Welding Procedure Specifications)
- P.W.H.T. (Post Weld Heat Treatment)
- P.Q.R. (Welding Procedure Qualification Record)
- W.P.Q.T. (Welders Performance Qualification Testing)
- Q.C.T.M. (Quality Control and Testing Manual)
- Preparation and submitting of modification information for as built drawings
- Installation and detail drawing
- Equipment load & arrangement drawings (Civil & structure inputs)
- Heat balance and hydraulic calculation report

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- Calculation Documents including sizing/design of vessel and accessories ,etc. (PVelite file ,etc.)
- Packing specification & datasheet
- Preparation and submitting of shop drawings
- Maintenance, operation and installation manual
- Certificate of origin for instrument

Notes:

1. The documents prepared by the Supplier shall be approved by purchaser before manufacturing process starts.
2. The documents shall be supplied in three hard copies and two soft copies in MS Office 2010 or above/new version software on CD.
3. The drawings shall be supplied in soft copies in AutoCAD 2010 or above/new version format
4. The Supplier is responsible for correctness of shop drawings and Purchaser will only review these drawings.

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6. Tests and Inspections

The following tests shall be performed for all equipment by the Supplier but not limited to:

1. Material Inspection
2. Visual inspection
3. Dimensional inspection
4. Heat treatment
5. Welding Inspection
 - Visual inspection
 - Magnetic particle test
 - Liquid Penetrant test
 - Ultrasonic test
 - Radiographic test
6. Hydrostatic pressure test
7. Leak test
8. Rust prevention and painting inspection
9. Pre-assembly inspection performed at Shop
10. Marking inspection for packing
11. Final inspection prior to packing
12. Packing inspection

Notes:

1. Purchaser's representatives shall have an unrestricted access to the manufacturing shop of the Supplier to witness all manufacturing procedures, tests, and inspections performed on the parts and assemblies.
2. The procedures and criteria of tests and inspections applied to any part shall be proposed in the Q.C.T.M, which manufacturer shall take purchaser's approval.

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7. Surfaces Protection

For surface protection and rust prevantion refer to “painting specification” document which is attached to this enquiry in section 12 ” REFERENCE DOCUMENTSS”.

NAME	PAINTING SPEC.	RAL NO.	PAINTING COLOR
MECHANICAL AND EQUIPMENT			
Process Gas Mist Eliminator	No. 2	6021	Light Grey Green

Painting Specification NO.2

PROCESS		PAINT NAME & TREATMENT	No. OF COAT	PAINTING METHOD	DRY FILM THICKNESS PER COAT
AT SHOP	SURFACE PREPARATION	BLAST CLEANING (SIS SA 2 1/2)			
	1 ST COAT	(P-04) Epoxy Polyamid Zinc Rich	1	AL	80 microns
	2 ND COAT	(P-14) High Biuld Epoxy Polyamid Intermediate	1	AL	120 microns
	3 RD COAT	(P-23) Polyurethane Aliphatic Finish Coat	1	AL	50 microns
Total DFT					250 microns

Notes

1. In case of using shop prime steel, SD zinc primer ZE NO.1000 shall be applied as shop primer.
2. It permits a heat resistance up to 100 °C.

General Notes:

1. All Painting spec shall be applied at shop. Touch up only will be done at site.
2. Painting method is stated in the paint manufacturer's specification.
3. Portions which are to be welded later shall not be painted up to a proper distance.
4. Portions beneath parts of frictional connections shall not be subjected to painting.

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8. Packing and Delivery

8.1. Domestic Delivery

All equipment items shall be seaworthy and truck packed as per document "Packing standard" (section 12 "REFERENCE DOCUMENTS" as a guideline) and delivery point to be agreed.

8.2. Packing specifications

1. All packing must be strong and safe enough for transport and all responsibilities are for Supplier. Supplier shall submit "Packing procedure and specifications" and "Timetable for packing and delivery" for purchaser's approval.
2. All machined surfaces should be protected by Tectyl.
3. All packages should hold name-plate and packing list to identify package. Type and format needs PURCHASER's approval.
4. PURCHASER's approval on packing is required before delivery.
5. A copy of packing list and supply list will accompany each package. The documents necessary for final inspection and release for packing will include, but are not limited to the followings:
 - Reports on tests performed.
 - Casing certificates.
 - Pressure testing certificates.
 - Results of non-destructive tests, together with the pertinent sketches and descriptions.
 - Supply list of equipment.

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Notes:

1. The Supplier shall contact the Office of Internal Transportation of Ministry of Roads and Transportation or Traffic Police Offices to check for the maximum package size to be delivered.
2. All material, equipment and machinery shall be carefully packed for sea and land transportation and extended storage at Site of at least 24 months under tropical conditions.

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9. Guarantee

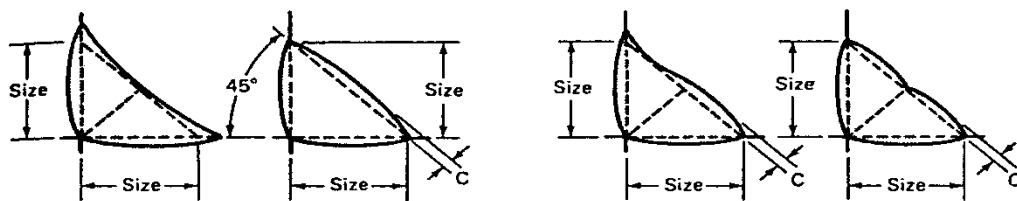
All the activities which fall into the duty of the supplier which mentioned in the scope of supply in section 2 shall be guaranteed for the period of one year after commissioning or two years after delivery whichever comes earlier. They shall conform to the relevant drawings and The Technical Specifications of Section 1.

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10. Appendix

10.1. Welding Inspection

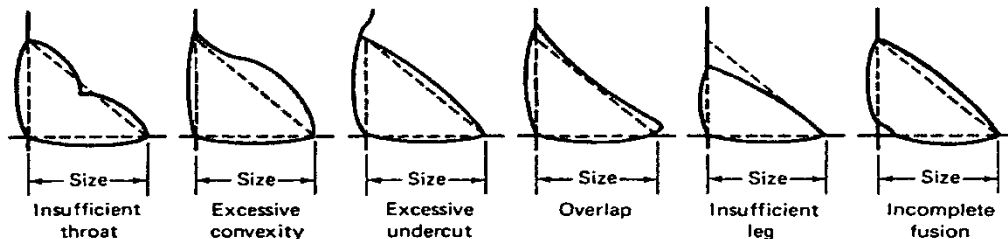
Visual Inspection Criteria



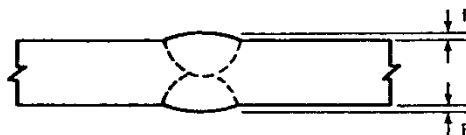
Note: Convexity, C, of a weld or individual surface bead shall not exceed 0.07 times the actual face width of the weld or individual bead, respectively, plus 0.06 in. (1.5 mm).

(A) Desirable fillet weld profiles

(B) Acceptable fillet weld profiles

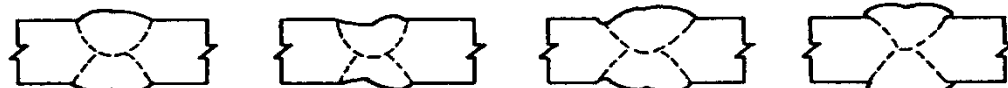


(C) Unacceptable fillet weld profiles



Note: Reinforcement R shall not exceed 1/8 in. (3.2 mm). See 3.6.2.

(D) Acceptable groove weld profile in butt joint



Excessive
convexity
See 3.6.2

Insufficient
throat
See 3.6.3

Excessive
undercut
See 8.15.1.5, 9.25.1.5,
or 10.17.1.5

Overlap
See 3.6.4

(E) Unacceptable groove weld profiles in butt joints

Acceptable and Unacceptable Weld Profiles

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10.2. Quality Control Plan

10.2.1. Definitions and Abbreviations

In this manual following definition are applied:

☐ **Product**

The term "Product" shall be applied to the parts, equipment, or the structure which are made from welded plates, assemblies, and sub-assemblies, indicated on reference drawings or part list.

☐ **Owner**

The term indicates the inspectors, IGISCO representatives, or any authority specified by IGISCO to supervise, control, check or witness the activities described in this document.

☐ **Client / purchaser**

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☐ **Engineer**

ASYN Steel Engineering (ASE)

☐ **Supplier**

Mean the person or persons firm or company whose proposal has been accepted.

☐ **Sub-supplier**

Mean any person (other than the supplier) named in the contract for any of the works.

☐ **Works**

Mean all equipment and technical services to be provided by the supplier under the contract.

☐ **Approve**

Means approve in writing letter confirmed by buyer.

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10.2.2. Abbreviations

Assy:	Assembly (ing)
CAT:	Category
DWG:	Drawing
Insp.:	Inspection
MAT:	Material Testing
N.C.R:	Non-Conformity Report
P:	Workshop
PA:	Pre-Assembly
PI:	Rust prevention & Painting
Q.C.T.M:	Quality Control and Testing Manual
S:	Site
STD:	Standard
VT:	Visual Testing
SQ:	Special Quality
DT:	Dimensional Control
MT:	Magnetic Particle Testing
PT:	Liquid Penetrate Testing
UT:	Ultrasonic Testing
RT:	Radiographic Testing
QCP:	Quality Control Plan
WPQ:	Welder Procedure Qualification
WQR:	Welder's Qualification

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10.2.3. Inspection Categories

Inspection of structures and materials are classified in four Categories A, B, C and D as specified below:

CAT.A: Inspection or testing shall be witnessed by the sub-supplier. The test reports shall be prepared, but need not be submitted to PURCHASER. This category applies to mass-production, standard part (e.g., low tensile strength bolts, nuts, etc.).

CAT. B: Inspection and testing shall be witnessed by the supplier and sub-supplier. In addition to the requirements listed in CAT.A the following shall be mentioned in the test report. Test report need not be submitted to PURCHASER. In case of inspector requisition test reports shall be submitted to PURCHASER.

- Purchasing order number of the supplier
- Results of test run (if required).
- Consumption figures (if required).
- Completeness
- All information required to the inspection and testing item list.

CAT.C: In addition to the requirements listed in CAT. B. the inspection and test report shall be submitted to PURCHASER.

CAT.D: In addition to the requirements listed in CAT. C. Sampling, testing and inspection shall be witnessed by the PURCHASER's inspector.

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10.2.4. Inspection Item Groups

Insp. Item	Group	Description/examples	
0	Documentation	- Time Schedule - Supply List - Packing List - Final Book	
1	Mist eliminator	X-0	Assembly
		X-1	Vessel Shell
		X-2	Dished Head
		X-3	Element (Internal unit) (if any)
		X-4	Element Frame (if any)
		X-5	Nozzles
		X-6	Flanges, Manhole, Davit
		X-7	Non-pressurized parts (Vessel support, Pipe, Supports, Lifting Lugs, Bearing Plates, etc.)
2	Completeness	- Contract balancing - Insp. Certificate Issuance	

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Inspection and Procedure /Acceptance Criteria References Table

Insp. Item	Inspection/Test Description	%	Insp. Cat.	Procedure	Acceptance criteria	Place	Remarks
0	Time Schedule	100	D	Common practice	PURCHASER approved	PURCHASER	See note (*1)
	Material Certification	100	C	ASTM/DIN EN 10025/JIS	DWG.	P	See note (*2)
	WPS	100	D	ASME IX	ASME IX	P	See note (*3)
	WQR	100	D	ASME IX	ASME IX	P	Both together (Supplier and Inspector)
	WPQ	100	C	ASME IX	ASME IX	P	Inspector Responsibility
	Supply List Verification	100		Common practice	DWG. & Enquiry	PURCHASER	
	Packing List Confirmation	100	D	Common practice	See remarks	P	Each Packing List Shall be Confirmed by PURCHASER's Inspector
	Periodical progression record	100	C	PURCHASER directive	Time Schedule	P	Records shall be approved by Inspector
	Quality and Quantity cert.	100	C	Contract and QCP	Contract and QCP	P	
	Inspection cert.	100	D	Common practice	DOC. Satisfactory	PURCHASER	
	Final Book	100	C	Common practice	DOC. Satisfactory	P	See note (*4)
1	X-0	Visual inspection	100	D	Common Practice	P+S	
		Tightness Test before hydro. test	100	D	ASME SEC.VIII	P	
		Leak test after hydro. test	100	D	ASME SEC.VIII	P+S	
		Magnetic particle test (MT)	100	D	ASME IX	P	
		Radiographic Test (RT)	20	C	ASME SEC.V	P	
		Dimensional inspection	100	D	ISO 2768, ISO 13920	P+S	
		Material certificate	100	C	ASTM/DIN EN 10025/JIS	P	See note (*2)
		Welding Inspection	100	C	ASME SEC.VIII	P	

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Insp. Item	Inspection/Test Description	%	Insp. Cat.	Procedure	Acceptance criteria	Place	Remarks
1	X-0	100	D	Refer to section 7	Refer to section 7	P+S	See note (*8)
		100	D	Common Practice	According to DWG.	P	
		100	D	ASME Sec VIII Div.1	ASME Sec VIII Div.1	P	
		100	D	PURCHASER standard	PURCHASER standard	P	Refer to section 9 this booklet
	X-1, X-2	100	C	JIS, ASTM, DIN EN 10025	DWG.	P	See note (*2)
		100	C	ASME SEC.VIII	ASME SEC.VIII	p	
		100	D	According to DWG.	Common Practice	P	
		100	D	ISO 2768, ISO 13920	According to DWG.	P	
		20	D	ASME IX	ASME IX	P	
		100	D	ASME IX	ASME IX	P	
		100	D	ASME SEC.VIII	No leakage and serious deformation	P	1 Bar pneumatic and soap bubble test, see note 9
	X-3	100	C	JIS, ASTM, DIN EN 10025	DWG.	P	See note (*2)

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Insp. Item		Inspection/Test Description	%	Insp. Cat.	Procedure	Acceptance criteria	Place	Remarks
1	X-3	Visual inspection	100	D	According to DWG.	Common Practice	P	
		Dimension control	100	D	ISO 2768, ISO 13920	According to DWG.	P	
	X-4	Material certificate	100	C	JIS, ASTM, DIN EN 10025	DWG.	P	See note (*2)
		Visual inspection	100	D	According to DWG.	Common Practice	P	
		Dimension control	100	D	ISO 2768, ISO 13920	According to DWG.	P	
		Radiographic test (RT)	20	D	ASME IX	ASME IX	P	
		Magnetic & penetration particle test (MT/PT)	100	D	ASME IX	ASME IX	P	
1	X-5, X-6	Material certificate	100	C	JIS, ASTM, DIN EN 10025	DWG.	P	See note (*2)
		Welding Inspection	100		ASME SEC.VIII	ASME SEC.VIII	P+S	
		Hydrostatic Test	100	D	ASME SEC.VIII	ASME SEC.VIII	p	
		Visual inspection	100	D	According to DWG.	Common Practice	P	
		Dimension control	100	D	ISO 2768, ISO 13920	According to DWG.	P	
		Radiographic test (RT)	20	D	ASME IX	ASME IX	P	
		Magnetic & penetration particle test (MT/PT)	100	D	ASME IX	ASME IX	P	
1	X-7	Material certificate	100	C	JIS, ASTM, DIN EN 10025	DWG.	P	See note (*2)
		Visual inspection	100	D	According to DWG.	Common Practice	P	
		Dimension control	100	D	ISO 2768, ISO 13920	According to DWG.	P	
		Bolt & Nut & Washer Inspection	20	C	Common Practice	Common Practice	P	
2		Contract Balancing	100	D	Common Practice	Common Practice	P	Inspector Responsibility
		Inspection Certify. Issuance	100	D	Common Practice	Common Practice	P	Inspector Responsibility, See note (*7)

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NOTES:

- (*1)-Inspection and test planning within time schedule shall be provided by supplier and approved by PURCHASER
- (*2)-Material certificate is not required for followings carbon steel plates, sheets and strips of UTS < 400MPa used for fabricating non-pressure parts. But for shell and head, mill certificate shall be provided.
- (*3)-Supply list, WPS and PQR shall be submitted to PURCHASER in order to verification prior to production activities.
- (*4)-Supplier is responsible for providing individual final book for supports which has to be containing complete relevant quality evidences and Doc's. Matters have to conformed, shall trace and distinguish with both QCTM and supply list quotations.
- (*5)-MT shall be performed circumferential and longitudinal butt weld joints of shell, head and pipe.
- (*6)-PT shall be performed stainless steel (SUS310S only) weldments.
- (*7)-After compliance of shipments, balancing and fulfillment of contractual commitments initial inspection certification may be issued by inspector
- (*8)-If any test and/or inspection due to any technical reason shall be done at Site then existing QCP achievements and inspection process also shall be drawn to field area automatically.
- (*9)-Shall be tested after hydrostatic test of vessel.
- (*10)-It is clear that all weld lines are required 100% visual inspection.
- (*11)- If quality is not meeting with technical requirements with satisfactory, inspector has right to go on beyond the quality indicated in QCP upon 100%.

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11. Quotation Summary Sheet

The summary sheet shall contain the following subjects.

- Design pressure (kg / cm²G)
- Design Temperature (°C)
- Moisture removal (micron)
- Outside diameter of vessel (mm)
- Length of vessel (mm)
- Standard, Size & Rating of Flanges
- Internal unit type
- Internal unit material
- Max. pressure drop
- Materials of Parts
- Weight

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12. Reference documents

- Process Design Data
- Top Gas Scrubber Detailed Drawing (Including Venturi Drawing)
- Marking and Packing Specification
- Painting Specification
- General Requirements for Vessel Fabrication