

National Board Number: 3
Mfr. Representative: Göbel Date: 14/11/2016
Authorized Inspector: Jed Date: 14/11/2016

FORM U-1 MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS
As Required by the Provisions of the ASME Boiler and Pressure Vessel Code Rules, Section VIII, Division 1

1. Manufactured and certified by Schrader Apparatebau GmbH, Schleebergstrasse 12, Ennigerloh 59320, Germany
(Name and address of Manufacturer)
2. Manufactured for Evonik Degussa Corporation, PO Box 868, US-Theodore AL 36590
(Name and address of Purchaser)
3. Location of installation Evonik Corporation, Mobile, 4201 Degussa Road, US-Theodore AL 36582
(Name and address)
4. Type Vertical Heat exchanger 10911-01
(Horizontal, vertical, or sphere) (Tank, separator, jkt. vessel, heat exch., etc.) (Manufacturer's serial number)
n.a. 214-0451-16-001 Rev. 4 3 2015
(CRN) (Drawing number) (National Board number) (Year built)
5. ASME Code, Section VIII, Div. 1 Edition 2013 n.a. n.a.
(Edition and Addenda, if applicable (date)) (Code Case number) (Special service per UG-120(d))

Items 6-11 incl. to be completed for single wall vessels, jackets of jacketed vessels, shell of heat exchangers, or chamber of multichamber vessels.

6. Shell: (a) Number of course(s) 2 (b) Overall length 1721

Course(s)			Material		Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B & C)			Heat Treatment	
No.	Diameter	Length	Spec./Grade or Type		Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
1	OD 609,6	568	SA-240 304L		6	0	1	spot	0.85	1	spot	0.85	n.a.	n.a.
2	OD 609,6	1025	SA-240 304L		6	0	1	spot	0.85	1	spot	0.85	n.a.	n.a.

Body Flanges on Shells									Bolting			
No.	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Location	Num & Size	Bolting Material	Washer (OD, ID, thk)	Washer Material
n.a.												

7. Heads: (a) n.a. (b) n.a.
(Material spec. number, grade or type) (H.T. — time and temp.) (Material spec. number, grade or type) (H.T. — time and temp.)

	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemis. Radius	Flat Diameter	Side to Pressure		Category A	
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None
(a)	n.a.												
(b)													

Body Flanges on Heads									Bolting			
	Location	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Num & Size	Bolting Material	Washer (OD, ID, thk)	Washer Material
(a)	n.a.											
(b)												

8. Type of jacket n.a. Jacket closure n.a.
(Describe as ogee and weld, bar, etc.)
If bar, give dimensions n.a. If bolted, describe or sketch.
9. MAWP 5,2 bar 1 bar at max. temp. 250 °C 250 °C Min. design metal temp. -29 °C at 5,2 bar
(Internal) (External) (Internal) (External)
10. Impact test No, exempted as per UHA-51(d) at test temperature of n.a.
(Indicate yes or no and the component(s) impact tested)
11. Hydro., pneu., or comb. test pressure hydro.: 10,6 bar Proof test n.a.

Items 12 and 13 to be completed for tube sections.

12. Tubesheet SA-240 316L 749,3 55 0 welded
(Stationary (material spec. no.)) (Diameter (subject to press.)) (Nominal thickness) (Corr. allow.) (Attachment (welded or bolted))
n.a. n.a. n.a. n.a. n.a.
(Floating (material spec. no.)) (Diameter) (Nominal thickness) (Corr. allow.) (Attachment)
13. Tubes SA-213 TP316L 50,8 2,11 71 straight
(Material spec. no., grade or type) (O.D.) (Nominal thickness) (Number) (Type (straight or U))

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Items 14–18 incl. to be completed for inner chambers of jacketed vessels or channels of heat exchangers.

14. Shell: (a) No. of course(s) 3 (b) Overall length 200 / 1400 / 249

Course(s)			Material		Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B & C)			Heat Treatment	
No.	Diameter	Length	Spec./Grade or Type		Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
1	OD 609,6	200	SA-240 316L		6	0	1	Spot	0.85	1	Spot	0.85	n.a.	n.a.
2	OD 609,6	1400	SA-240 316L		6	0	1	Spot	0.85	1	Spot	0.85	n.a.	n.a.
3	OD 609,6 / OD 323,8	249	SA-240 316L		6	0	1	Spot	0.85	1	Spot	0.85	n.a.	n.a.

Body Flanges on Shells													Bolting		
No.	Type	ID	OD	Flange Thk	Min Hub Thk	Material		How Attached	Location	Num & Size	Bolting Material	Washer (OD, ID, thk)	Washer Material		
1	WN	597,6	609,6	152,4	6	SA-182 F316L		welded	Bottom	20 - 1 1/4"	SA-193 B7	60 , 32 , 3	Stainless Steel		
2	WN	597,6	609,6	152,4	8	SA-182 F316L		welded	Top	20 - 1 1/4"	SA-193 B7	60 , 32 , 3	Stainless Steel		

15. Heads: (a) SA-240 316L (b) n.a.
(Material spec. number, grade, or type) (H.T. — time and temp.) (Material spec. number, grade, or type) (H.T. — time and temp.)

	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemis. Radius	Flat Diameter	Side to Pressure		Category A		
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.
(a)	Top	6.0	0	610	61	n.a.	n.a.	n.a.	n.a.	Yes	Yes	1	Spot	0.85
(b)														

Body Flanges on Heads													Bolting		
	Location	Type	ID	OD	Flange Thk	Min Hub Thk	Material		How Attached	Num & Size	Bolting Material	Washer (OD, ID, thk)	Washer Material		
(a)															
(b)															

16. MAWP 3,1 bar (Internal) 1,0 bar (External) at max. temp. 250 °C (Internal) 250 °C (External) Min. design metal temp. -29 °C at 3,1 bar

17. Impact test No, exempted as per UHA-51(d) at test temperature of n.a.
(Indicate yes or no and the component(s) impact tested)

18. Hydro., pneu., or comb. test pressure hydro.: 7,6 bar Proof test n.a.

19. Nozzles, inspection, and safety valve openings:

Purpose (Inlet, Outlet, Drain, etc.)	No.	Diameter or Size	Type	Material		Nozzle Thickness		Reinforcement Material	Attachment Details		Location (Insp. Open.)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
Inlet A1	1	NPS 3	#150	SA-790 S31803	SA-182 F316L	5,49	0	SA-240 316L	UW-16.1(c)	Wld.	-
Inlet A2	1	NPS 2	#150	SA-790 S31803	SA-182 F304L	3,91	0	SA-240 316L	UW-16.1(c)	Wld.	-
Outlet B1	1	NPS 12	#150	SA-240 316L	SA-182 F316L	6,0	0	Integral	UW-16.1(c)	Wld.	-
Outlet B2	1	NPS 1	#150	SA-312 TP316L	SA-182 F304L	3,38	0	Integral	UW-16.1(c)	Wld.	-
Vent V1	1	NPS 1	#150	SA-312 TP316L	SA-182 F304L	3,38	0	Integral	UW-16.1(c)	Wld.	-
Drain D1	1	NPS 1	#150	SA-312 TP316L	SA-182 F304L	3,38	0	Integral	UW-16.1(c)	Wld.	-

20. Supports: Skirt No (Yes or no) Lugs 3 (Number) Legs n.a. (Number) Others 4 x Brackets (Describe) Attached Welded to head and shell (Where and how)

21. Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report (list the name of part, item number, Manufacturer's name, and identifying number):

Lens expansion joint, Item 7; Manufacturer: HKS-CZ, s.r.o., Mlékojedská 1994/7, 41201 Litomerice, Czech Republic; Serial-Number: SN3509268-2-1/151321

22. Remarks

For non-corrosive service only. Safety valve is not in scope of supply of Schrader. All units are in [mm] unless otherwise stated. Spot RT performed according to UW-11(b) and UW-11(a)(5)(b) (RT4). E Head and E Shell = 0,85. No PWHT required. Impact testing exempted as per UHA-51(d).

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CERTIFICATE OF SHOP COMPLIANCE

We certify that the statements in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1.

U Certificate of Authorization Number U-51,435 Expires Sept. 11, 2018Date Jan 14/2016 Name Schrodes Apparatebau GmbH Signed [Signature]
(Manufacturer) (Representative)

CERTIFICATE OF SHOP INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and employed by TÜV NORD Systems GmbH & Co. KG of Essen, Germany

have inspected the pressure vessel described in this Manufacturer's Data Report on Dec. 3rd, 2015, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. By signing this certificate neither the Inspector nor his/her employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his/her employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date 14/11/2016 Signed [Signature] Commissions NB 14044 AmB
(Authorized Inspector) (National Board (incl. endorsements))

CERTIFICATE OF FIELD ASSEMBLY COMPLIANCE

We certify that the statements in this report are correct and that the field assembly construction of all parts of this vessel conforms with the requirements of ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. U Certificate of Authorization Number _____ Expires _____

Date _____ Name _____ Signed _____
(Assembler) (Representative)

CERTIFICATE OF FIELD ASSEMBLY INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and employed by _____

of _____, have compared the statements in this Manufacturer's Data Report with the described pressure vessel and state that parts referred to as data items _____, not included in the certificate of shop inspection, have been inspected by me and to the best of my knowledge and belief, the Manufacturer has constructed and assembled this pressure vessel in accordance with the ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. The described vessel was inspected and subjected to a hydrostatic test of _____. By signing this certificate neither the Inspector nor his/her employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his/her employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date _____ Signed _____ Commissions _____
(Authorized Inspector) (National Board (incl. endorsements))

As Required by the Provisions of the ASME Boiler and Pressure Vessel Code Rules, Section VIII, Division 1

(Name and address of Manufacturer)
2. Manufactured for Evonik Degussa Corporation, PO Box 868, US-Theodore AL 36590
(Name and address of Purchaser)

4. Type	Vertical (Horizontal, vertical, or sphere)	10911-01 (Manufacturer's serial number)	n.a. (CRN)
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2015
(Year built)[illegible]

Date 14/1/2016 Name [Signature] Commissions NB 1404 Ar
(Authorized Inspector) (National Board incl. endorsements)