

**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 Wuxi Zhicheng Biochemical Engineering Equipment Co., Ltd. No.8 Baoyuan Road Machinery Equipment Industrial Park, B Zone Yangjian Town, Xishan District, Wuxi City, Jiangsu Province 214108 People's Republic of China.  
(Name and address of Manufacturer)

2. Manufactured for Not known  
(Name and address of Purchaser)

3. Location of installation Not known  
(Name and address)

4. Type Vertical Heat exchanger WZA21-20  
(Horizontal, vertical, or sphere) (Oil/steam heat exchanger W521B.2)(19-X-851) (Manufacturer's serial number)  
NA WXZC21A13-00 Rev.1 150 2021  
(CRN) (Drawing number) (National Board number) (Year built)

5. ASME Code, Section VIII, Div. 1 2019 Edition NA NA  
[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) 4 (b) Overall length 3396mm

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	See attached form U-4 page 1 of 2													

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

7. Heads: (a) NA (b) NA  
(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	Hemispherical Radius	Flat Diameter	Side to Pressure		Category A		
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.
(a)	NA													

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

8. Type of jacket NA Jacket closure NA  
(Describe as ogee and weld, bar, etc.)

If bar, give dimensions; if bolted, describe or sketch NA

9. MAWP 1.2MPa 0.1MPa at max. temp. 220°C 220°C Min. design metal temp. -10°C at 1.2MPa  
(Internal) (External) (Internal) (External)

10. Impact test No, Per UHA-51(d)(e)(h) at test temperature of NA  
[Indicate yes or no and the component(s) impact tested]

11. Hydro., pneu., or comb. test pressure Hydro. Test at 1.69MPa (Horizontal) Proof test NA

**Items 12 and 13 to be completed for tube sections.**

12. Tubesheet SA-240 S32205 770mm/770mm 50mm/50mm 0mm/0mm Welded/Welded  
[Stationary (material spec. no.)] [Diameter (subject to press.)] [Nominal thickness] [Corr. allow.] [Attachment (welded or bolted)]  
NA NA NA NA NA  
[Floating (material spec. no.)] [Diameter] [Nominal thickness] [Corr. allow.] [Attachment]

13. Tubes SA-789 S32205 19.05mm 1.65mm 544 pcs Straight (L=3500mm)  
(Material spec. no., grade or type) (O.D.) (Nominal thickness) (Number) [Type (straight or U)]

*Chen zhengming*  
2021.12.22

*Jiangyong Wang*  
December 22, 2021



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Manufactured by Wuxi Zhicheng Biochemical Engineering Equipment Co., Ltd.  
 Manufacturer's Serial No. WZA21-20 CRN NA National Board No. 150

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

14. Shell: (a) Number of course(s) 1/1 (Top/Bottom) (b) Overall length 427mm/427mm (Top/Bottom)

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	I.D. 660mm	427mm	SA-240 S32205	6mm	0mm	1	Spot	0.85	1/Man. App.2 Fig. 2-4(8)	Spot/NA	0.85/NA	NA	NA
2	I.D. 660mm	427mm	SA-240 S32205	6mm	0mm	1	Spot	0.85	1/Man. App.2 Fig. 2-4(8)	Spot/NA	0.85/NA	NA	NA

## Body Flanges on Shells

No.	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Location	Bolting			
									Num & Size	Bolting Material	Washer (OD, ID, thk)	Washer Material
1	FM	675 mm	770 mm	Nominal 76mm	NA	SA-182 F304	Welded	Top	28& M16X175mm	SA-193 B8	O.D.43.5/I.D. 17.5/T3.5 (mm)	SA-240 304
2	FM	675 mm	770 mm	Nominal 76mm	NA	SA-182 F304	Welded	Top	28& M16X175mm	SA-193 B8	O.D.43.5/I.D. 17.5/T3.5 (mm)	SA-240 304

15. Heads: (a) Top: SA-240 S32205 Cold forming, NOT PWHT (b) Bottom: SA-240 S32205 Cold forming, NOT PWHT  
 (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	Hemispherical Radius	Flat Diameter	Side to Pressure		Category A		
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.
(a)	Top	6.5mm	0mm	R 660 mm	R 66 mm	NA	NA	NA	NA	No	Yes	S	Full	0.85
(b)	Bottom	6.5mm	0mm	R 660 mm	R 66 mm	NA	NA	NA	NA	No	Yes	S	Full	0.85

## Body Flanges on Heads

	Location	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Bolting			
									Num & Size	Bolting Material	Washer (OD, ID, thk)	Washer Material
(a)	NA											

16. MAWP 1.2MPa 0.1 at max. temp. 220°C 220°C Min. design metal temp. -10°C at 1.2MPa  
 (Internal) (External) (Internal) (External)

17. Impact test No, Per UHA-51(d)(e)(h) at test temperature of NA  
 [Indicate yes or no and the component(s) impact tested]

18. Hydro., pneu., or comb. test pressure Hydro. Test at 1.69MPa (Horizontal) Proof test NA

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	
See attached form U-4 page 2 of 2											

20. Supports: Skirt NA Lugs 4 Legs NA Others 7 Lifting lugs Attached Remarks 7  
 (Yes or no) (Number) (Number) (Describe) (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):

NA

22. Remarks

- 1, Impact test exempted per UHA-51(d)(e)(h).
- 2, PWHT are exempted by UHA-32.
- 3, The safety valve is to be installed at pipe system at site by user.
- 4, For each design and operating condition, see attached Form U-5.
- 5, UG-46(a) " when inspection openings are omitted in fixed tube sheet heat exchangers.
- 6, The channel flange gaskets: O.D. 701/I.D. 675X3mm, GARLOCK 3510, 2 pcs.
- 7, 4 Lifting lugs welded to the Top head and bottom channel shell, the others welded to the shell.

Chen zhengming  
2021. 12. 22

Jiangyong Wang  
December 22, 2021



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Manufactured by Wuxi Zhicheng Biochemical Engineering Equipment Co., Ltd.  
Manufacturer's Serial No. WZA21-20 CRN NA National Board No. 150

## 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 36,922 Expires Sept. 21, 2022

Date 2021. 12 . 22 Name Wuxi Zhicheng Biochemical Engineering Equipment Co., Ltd. Signed Chen Zhongming  
(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 LRQA Verification Limited of UK

have inspected the pressure vessel described in this Manufacturer's Data Report on December 22, 2021, 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 December 22, 2021 Signed Jiangang Wang Commissions AI Commission No.: 14743  
(Authorized Inspector) (National Board Authorized Inspector Commission number)

## 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 Authorized Inspector Commission number)



**FORM U-4 MANUFACTURER'S DATA REPORT SUPPLEMENTARY SHEET**  
**As Required by the Provisions of the ASME Boiler and Pressure Vessel Code Rules, Section VIII, Division 1**

1. Manufactured and certified by Wuxi Zhicheng Biochemical Engineering Equipment Co., Ltd. No.8 Baoyuan Road Machinery Equipment Industrial Park, B Zone Yangjian Town, Xishan District, Wuxi City, Jiangsu Province 214108 People's Republic of China.  
(Name and address of Manufacturer)

2. Manufactured for Not known  
(Name and address of Purchaser)

3. Location of installation Not known  
(Name and address)

4. Type Vertical Heat exchanger WZA21-20  
(Horizontal, vertical, or sphere) (Oil/steam heat exchanger W521B.2)(19-X-851) (Tank, separator, heat exch., etc.) (Manufacturer's serial number)

NA WXZC21A13-00 Rev.1 150 2021  
(CRN) (Drawing number) (National Board number) (Year built)

## Data Report

Item Number	Remarks
Item 6	
Shell:	

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	I.D.660mm	1500mm	SA-240 304	8mm	0mm	1	Spot	0.85	1/ Fig.UW-13.2(j)	Spot/NA	0.85/ NA	None	NA
2	O.D.906mm/ O.D.676mm	216mm	SA-240 304	8mm	0mm	1	Full	1	1/ 1	Spot/ Spot	0.85/ 0.85	None	NA
3	I.D.660mm	750mm	SA-240 304	8mm	0mm	1	Spot	0.85	1/ 1	Spot/ Spot	0.85/ 0.85	None	NA
4	I.D.660mm	930mm	SA-240 304	8mm	0mm	1	Spot	0.85	1/ Fig.UW-13.2(j)	Spot/NA	0.85/ NA	None	NA

Certificate of Authorization: Type U No. 36,922 Expires Sept. 21, 2022

Date 2021. 12. 22 Name Wuxi Zhicheng Biochemical Engineering Equipment Co., Ltd. Signed Chen Shengming  
(Manufacturer) (Representative)

Date December 22, 2021 Signed Jiangang Wang Commissions AI Commission No.: 14743  
(Authorized Inspector) (National Board Authorized Inspector Commission number)



**FORM U-4 MANUFACTURER'S DATA REPORT SUPPLEMENTARY SHEET**  
**As Required by the Provisions of the ASME Boiler and Pressure Vessel Code Rules, Section VIII, Division 1**

1. Manufactured and certified by	Wuxi Zhicheng Biochemical Engineering Equipment Co., Ltd. No.8 Baoyuan Road Machinery Equipment Industrial Park, B Zone Yangjian Town, Xishan District, Wuxi City, Jiangsu Province 214108 People's Republic of China. (Name and address of Manufacturer)		
2. Manufactured for	Not known (Name and address of Purchaser)		
3. Location of installation	Not known (Name and address)		
4. Type	Vertical (Horizontal, vertical, or sphere)	Heat exchanger (Oil/steam heat exchanger W521B.2)(19-X-851) (Tank, separator, heat exch., etc.)	WZA21-20 (Manufacturer's serial number)
	NA (CRN)	WXZC21A13-00 Rev.1 (Drawing number)	150 (National Board number)
			2021 (Year built)

## Data Report

Item Number	Remarks
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Item 19 Nozzles, inspection, and safety valve openings:

Purpose (Inlet, Outlet, Drain, etc)	No.	Diameter or Size (mm)	Type	Material		Nozzle Thickness		Reinforce ment Material	Attachment Details		Location (Insp. Open.)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
S1 Steam inlet	1	O.D. 114.3mm	ASME B16.5- 2013 Cl.150 flg. SO RF	SA-312 TP304	SA-182 F304	6.02mm	0mm	SA-240 304	Fig.UW- 16.1(e)	Fig. UW- 21(1)	NA
S2 Condensate outlet	1	O.D. 114.3mm	ASME B16.5- 2013 Cl.150 flg. SO RF	SA-312 TP304	SA-182 F304	6.02mm	0mm	SA-240 304	Fig.UW- 16.1(e)	Fig. UW- 21(1)	NA
S3 Shell side vent	1	O.D. 21.3mm	ASME B16.5- 2013 Cl.150 flg. SO RF	SA-312 TP304	SA-182 F304	2.77mm	0mm	Integral	Fig.UW- 16.1(c)	Fig. UW- 21(1)	NA
T1 Product 1+BE inlet	1	O.D. 168.3mm	ASME B16.5- 2013 Cl.150 flg. SO RF	SA-790 S32205	SA-182 F60	7.11mm	0mm	SA-240 S32205	Fig.UW- 16.1(e)	Fig. UW- 21(1)	NA
T2 Product 1+BE outlet	1	O.D. 168.3mm	ASME B16.5- 2013 Cl.150 flg. SO RF	SA-790 S32205	SA-182 F60	7.11mm	0mm	SA-240 S32205	Fig.UW- 16.1(e)	Fig. UW- 21(1)	NA
V1/V2/V3 Tube side vent	3	O.D. 21.3mm	ASME B16.5- 2013 Cl.150 flg. SO RF	SA-790 S32205	SA-182 F60	2.77mm	0mm	Integral	Fig.UW- 16.1(c)	Fig. UW- 21(1)	NA
D1/D2/D3 Tube side drain	3	O.D. 33.4mm	ASME B16.5- 2013 Cl.150 flg. SO RF	SA-790 S32205	SA-182 F60	3.38mm	0mm	Integral	Fig.UW- 16.1(c)	Fig. UW- 21(1)	NA

Certificate of Authorization: Type U No. 36,922 Expires Sept. 21, 2022

Date 2021.12.22 Name Wuxi Zhicheng Biochemical Engineering Equipment Co., Ltd. Signed Chen zhengming  
 (Manufacturer) (Representative)

Date December 22, 2021 Signed Jiangang Wang Commissions AI Commission No.: 14743  
 (Authorized Inspector) (National Board Authorized Inspector Commission number)



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

[illegible]

Remarks 4

Certificate of Authorization: Type		U	No.	36,922	Expires	Sept. 21, 2022
Date	2021.12.22	Name	Wuxi Zhicheng Biochemical Engineering Equipment Co., Ltd. (Manufacturer)		Signed	chen zhengping (Representative)
Date	December 22, 2021	Signed	Jiangang Wang (Authorized Inspector)	Commissions	AI Commission No.: 14743 (National Board Authorized Inspector Commission number)	