

## FORM U-1 MANUFACTURERS' DATA REPORT FOR PRESSURE VESSELS

E-504

as required by the provisions of the ASME Code rules, Section VIII, Division 1

1. Manufactured and certified by DOOSAN MANUFACTURING CO., LTD. BYUENGJUM PLANT ; #465-2  
 BYUENGJUM-RI, TAEAN-MYUN, IHWASUNG-GUN, KYUNGGI-DO, 170 KOREA  
 (name and address of manufacturer)

2. Manufactured for MITSUI ENGINEERING & SHIPBUILDING CO., LTD. ; TOKYO JAPAN  
 ADVANCED POLYPRO RESINS, INC. (name and address of purchaser)

3. Location of Installation 6600 EAST FIFTIEN MILE ROAD STERLING HEIGHTS, MICHIGAN 48077, U.S.A.  
 (name and address)

4. Type: HORIZ. H/E U104-53 N/A GC-HIE1-05407 REV.3 60 1987  
 (horiz or vert., tank) (mfr's serial no.) (CRN) (drawing no.) (Nat'l Bd no.) (year built)

5. The chemical and physical properties of all parts meet the requirements of material specifications of the ASME BOILER AND PRESSURE VESSEL CODE. The design, construction and workmanship conform to ASME Code, Section VIII, Division 1: 1983 EDITION  
 (year)

W-185-ADDLND N/A N/A  
 (addenda (date)) (Code Case no.) (special service per UG 120(d))

Items 6-11 inclusive to be completed for single wall vessels, jackets of jacketed vessels, or shells of heat exchangers.

Shell: SA-516 GR.60 .375" .0625" 2'-10" 19'-11"  
 (mat'l (spec. no., grade)) (nom thickness (in)) (corr allow (in)) (dia ID (ft & in)) (length (overall) (ft & in))

7. Seams: SNGL BUTT WLD. SPOT 85 N/A N/A SNGL BUTT WLD. SPOT 3  
 (long (dbl, sngl)) (RT (spot or full)) (left (°)) (RT temp (°F)) (times) (grth (dbl, sngl)) (RT (spot, partial, or full)) (no. of courses)

8. Heads: (a) N/A (b) N/A  
 (mat'l (spec. no., grade)) (mat'l (spec. no., grade))

|     | Location (top, bottom, ends) | Minimum Thickness | Corrosion Allowance | Crown Radius | Knuckle Radius | Elliptical Ratio | Conical Apex Angle | Hemispherical Radius | Flat Diameter | Side to Pressure (convex or concave) |
|-----|------------------------------|-------------------|---------------------|--------------|----------------|------------------|--------------------|----------------------|---------------|--------------------------------------|
| (a) | N/A                          |                   |                     |              |                |                  |                    |                      |               |                                      |
| (b) | N/A                          |                   |                     |              |                |                  |                    |                      |               |                                      |

If removable, bolts used (describe other fastenings): N/A  
 (mat'l, spec. no., gr size, no.)

9. Type of jacket: N/A Proof test N/A

10. Jacket closure: N/A If bar, give dimensions: N/A If bolted, describe or sketch

11. MAWP: 85 PSIG at max. temp. 140°F Min. temp.: N/A Hydro. ~~press~~ test press.: 128 PSIG  
 (psi) (°F) (when less than -20°F) (psi)

Items 12 and 13 to be completed for tube sections

(CLAD)

12. Tubesheets: SA-105+SA-240 GR.304 33.875" I.D. 1.750" .0625"+0" WELDED  
 (stationary mat'l (spec. no., gr)) (dia ID (in) subject to pressure) (nom thickness (in)) (corr allow (in)) (attachment (welded, bolted))

N/A N/A N/A N/A N/A  
 (floating mat'l (spec. no., gr)) (dia ID (in)) (nom thickness (in)) (corr allow (in)) (attachment)

13. Tubes: SA-213 GR.TP304 1" .083" 476 STRAIGHT  
 (mat'l (spec. no., gr)) (OD (in)) (nom thickness (in - or gauge)) (no.) (type (straight or U))

Items 14-17 inclusive to be completed for inner chambers of jacketed vessels or channels of heat exchangers

14. Shell: SA-240 GR.304 .250" NONE 2'-10" L-L: 1'-4"  
 (mat'l (spec. no., gr)) (nom thickness (in)) (corr allow (in)) (dia ID (ft & in)) (length (overall) (ft & in))

15. Seams: SNGL BUTT WLD. SPOT 85 N/A N/A SNGL BUTT WLD. SPOT L:1, R:1  
 (long (dbl, sngl)) (RT (spot or full)) (left (°)) (RT temp (°F)) (times) (grth (dbl, sngl)) (RT (spot, partial, or full)) (no. of courses)

16. Heads: (a) SA-240 GR.304 (b) SA-240 GR.304  
 (mat'l (spec. no., grade)) (mat'l (spec. no., grade))

|     | Location (top, bottom, ends) | Minimum Thickness | Corrosion Allowance | Crown Radius | Knuckle Radius | Elliptical Ratio | Conical Apex Angle | Hemispherical Radius | Flat Diameter | Side to Pressure (convex or concave) |
|-----|------------------------------|-------------------|---------------------|--------------|----------------|------------------|--------------------|----------------------|---------------|--------------------------------------|
| (a) | L-END                        | .225"             | NONE                | N/A          | N/A            | 2:1              | N/A                | N/A                  | N/A           | CONCAVE                              |
| (b) | R-END                        | .225"             | NONE                | N/A          | N/A            | 2:1              | N/A                | N/A                  | N/A           | CONCAVE                              |

If removable, bolts used (describe other fastenings): N/A  
 (mat'l, spec. no., gr size, no.)

17. MAWP: 85 PSIG at max. temp. 212°F Min. temp.: N/A Hydro. ~~press~~ test press.: 128 PSIG  
 (psi) (°F) (when less than -20°F) (psi)

## 18. Nozzles, inspection and safety valve openings:

| Purpose (inlet, outlet, drain, etc.) | Number | Dia. or Size | Type     | Mat'l.   | Nom Thickness | Reinforcement Material | How Attached | Location |   |
|--------------------------------------|--------|--------------|----------|----------|---------------|------------------------|--------------|----------|---|
| CCW IN                               | 1      | 8"           | CL150FLG | SA-106GR | B             | .500"                  | INTEGRAL     | WELDED   | - |
| RCCW OUT                             | 1      | 8"           | CL150FLG | SA-106GR | B             | .500"                  | INTEGRAL     | WELDED   | - |
| PCW IN                               | 1      | 6"           | CL150FLG | SA-312GR | TP304         | .280"                  | INTEGRAL     | WELDED   | - |
| PCW OUT                              | 1      | 6"           | CL150FLG | SA-312GR | TP304         | .280"                  | INTEGRAL     | WELDED   | - |
| VENT & DRAIN                         | 2      | 3/4"         | CL150WN  | SA-182GR | F304          | .375"                  | INTEGRAL     | WELDED   | - |
|                                      |        |              |          |          |               |                        |              |          |   |
|                                      |        |              |          |          |               |                        |              |          |   |
|                                      |        |              |          |          |               |                        |              |          |   |
|                                      |        |              |          |          |               |                        |              |          |   |
|                                      |        |              |          |          |               |                        |              |          |   |
|                                      |        |              |          |          |               |                        |              |          |   |
|                                      |        |              |          |          |               |                        |              |          |   |

19. Supports: Skirt NO Lugs N/A Legs N/A Other SADDLE Attached WELDED TO SHELL  
(yes or no) (no) (no) (describe) (where and how)

20. Remarks: Manufacturers' Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report: N/A  
(name of part, item number, mfr's name and identifying stamp)

\* INSP. OPENING : UG-46(a)

\* BOLTED TYPE BODY FLG : SA-105, BOLTING MAT'L: SA-193GR, 7/8"-10NCx16.3125", 40EA

## CERTIFICATE OF SHOP COMPLIANCE

We certify that the statements made in this report are correct and that all details of design, material, construction and workmanship of this vessel conform to the ASME Code for Pressure Vessels, Section VIII, Division 1

"U" Certificate of Authorization no. 18148 expires 12/15, 19 88

Date 3/25/87 Name DOOSAN MANUFACTURING CO., LTD. Signed [Signature] (S.W. LEL)  
(manufacturer) (representative)

## CERTIFICATE OF SHOP INSPECTION #465-2 BYUENGJUM-RI TALAN-MYUN

Vessel constructed by DOOSAN MFG. CO., LTD. BYUENGJUM PLANT, IHWASUNG-GUN, KYUNGGI-DO, 170 KOREA

I, the undersigned, holding a valid commission issued by The National Board of Boiler and Pressure Vessel Inspectors and the state or province of TEXAS and employed by THE HARTFORD STEAM BOILER I & I COMPANY

of HARTFORD CONN.

have inspected the pressure vessel described in this Manufacturers' Data Report on MAR. 25, 19 87, and state that, to the best of my knowledge and belief, the manufacturer has constructed this pressure vessel in accordance with ASME Code, Section VIII, Division 1.

By signing this certificate neither the inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in the Manufacturers' Data Report. Furthermore, neither the inspector nor his 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 3/25/87 Signed [Signature] Commissions N.B.#10440  
(Authorized Inspector) (Nat'l Bd. (incl. endorsements) state, prov. and no.)

## CERTIFICATE OF FIELD ASSEMBLY COMPLIANCE (N/A)

We certify that the field assembly construction of all parts of this vessel conforms with the requirements of Section VIII, Division 1 of the ASME BOILER AND PRESSURE VESSEL CODE.

"U" Certificate of Authorization no.   expires  , 19  

Date   Name   Signed    
(assembler that certified and constructed field assembly) (by representative)

## CERTIFICATE OF FIELD ASSEMBLY INSPECTION (N/A)

I, the undersigned, holding a valid commission issued by The National Board of Boiler and Pressure Vessel Inspectors and the state or province of   and employed by  

of   have compared the statements in this Manufacturers' 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 that to the best of my knowledge and belief, the manufacturer has constructed and assembled this pressure vessel in accordance with ASME Code, Section VIII, Division 1. The described vessel was inspected and subjected to a hydrostatic test of   psi.

By signing this certificate neither the inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in the Manufacturers' Data Report. Furthermore, neither the inspector nor his 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) (Nat'l Bd. (incl. endorsements) state, prov. and no.)