Exhibit No-16
Format No:CAP/WD/F-03 Rev 03
Dated:08.09.2014

CRYOLOR ASIA PACIFIC

WELDING CATALOGUE

PROJECT NO : C290222
VESSEL TYPE : RVTA 19
DRAWING NO: : HC002573 Rev.A

CATALOGUE NO : WC-C290222-REV 01
DATE : 05.01.2018

Weld No	Location of Weld	WPS No.& Rev No	Welding Process	Filler Metal AWS Specification (including brand name)	Preheat temperature (min) / Inter pass temperature (Max) (˚C)	Impact test Temperature (˚C)	Base metal thickness range		NDE Requirements				
									BCS			ACS	
							(T1)	(T2)	RT	PT (Root)	PT (Final)	RT	PT (Final)
A1,A2 A3 & A4	Long Seam Welding	WPS/CAP-006 Rev 1	SAW	ER 308L -SAW 120 (Wire) + SAW Flux 120S	16˚C / 150˚C	-196˚C	6.7mm	-	100%	Nil	Nil	Nil	100% (Note-9)
B2, B3, B4	Cir Seam Welding (Shell to Shell)	WPS/CAP-006 Rev 1	SAW	ER 308L -SAW 120 (Wire) + SAW Flux 120S	16˚C / 150˚C	-196˚C	6.7mm	-	100%	Nil	Nil	Nil	100% (Note-10)
B1 & B5	Cir Seam Welding (Shell to Dish)	WPS/CAP-007 Rev 1	GTAW + SAW	ER 308L (GTAW & SAW) TIG 120 for GTAW & SAW 120 (wire) + SAW 120S (Flux) for SAW	16˚C / 150˚C	-196˚C	6.7mm	8.0mm	100%	Nil	Nil	Nil	100% (Note-10)
D1, D2, D3, D4 & D5	Nozzle to top Dish end	WPS/CAP-017 Rev 0	GTAW	ER 308L (TIG-120)	16˚C / 150˚C	-196˚C	8.0mm	2.77mm, 3.68mm	Nil	100% (BG)	Nil	Nil	100%
D7, D8, D9,D10, D11 & D12	Nozzle to Bottom Dish end	WPS/CAP-017 Rev 0	GTAW	ER 308L (TIG-120)	16˚C / 150˚C	-196˚C	8.0mm	2.77mm, 3.68mm	Nil	100% (BG)	Nil	Nil	100%
M1a & M1b	Main support plate to Shell	WPS/CAP-017 Rev 0	GTAW	ER 308L (TIG-120)	16˚C / 150˚C	-196˚C	6.7mm	6mm	Nil	Nil	Nil	Nil	100%
M2a, M2b & M2c	Lifting lug to Dish end	WPS/CAP-017 Rev 0	GTAW	ER 308L (TIG-120)	16˚C / 150˚C	-196˚C	8.0mm	12mm	Nil	Nil	Nil	Nil	100%
M4a to M4f	Pipe support rod to Shell	WPS/CAP-017 Rev 0	GTAW	ER 308L (TIG-120)	16˚C / 150˚C	-196˚C	6.7mm	6mm	Nil	Nil	Nil	Nil	100%
M5a to M5h	Support for absorbant bag to Dish end	WPS/CAP-017 Rev 0	GTAW	ER 308L (TIG-120)	16˚C / 150˚C	-196˚C	8.0mm	6mm	Nil	Nil	Nil	Nil	100%
M7a to M7d	Name Plate Support rod to Top Dish end	WPS/CAP-017 Rev 0	GTAW	ER 308L (TIG-120)	16˚C / 150˚C	-196˚C	8.0mm	6.0mm	Nil	Nil	Nil	Nil	100%
M7e to M7h	Name Plate to Support Rod	WPS/CAP-017 Rev 0	GTAW	ER 308L (TIG-120)	16˚C / 150˚C	-196˚C	6.0mm	1.0mm	Nil	Nil	Nil	Nil	Nil
M3a & M3b	Back strip to shell (Top and Bottom)	WPS/CAP-017 Rev 0	GTAW	ER 308L (TIG-120)	16˚C / 150˚C	-196˚C	10.0mm	6.7mm	Nil	Nil	Nil	Nil	Nil

Note:

1) For SAW Processes: The following Pre use tested consumables shall be used. For 2.5mm Wire Batch No: 21217044 + Flux Batch No: 21117003 (Brand: Ador Fontech Limited)
2) For all Category A joints, the reinforcement shall not exceed 10% of the plate thickness or 3 mm,whichever is less. For all category B joints, the reinforcement shall not exceed 4.0mm, weld edges shall be merged smoothly in to the base metals.
3) For GTAW Process, use Filler Wire Brand: Ador Fontech Limited
4) For tack welding use WPS No: WPS/CAP-017 (Rev 00)
5) For repair welding use WPS No: WPS/CAP-017 (Rev 00)
6) Repair on base meterial shall not be done without AI concurrence.
7) All temporary attachment removal area shall be PT examined
8) Production Test Coupon not required as per UHA 51 (h) (2) & Mandatory Appendix 44-6.1 (g) (3)
9) If the Head contain long seam, (Seam less) (Cat - 'A') welds and all attachments including head to nozzle welds shall be PT examined after Cold Stretch process.
10) If any rejectable defects are detected in the PT Examination of Category A joints and attachment welds then, all category B weld joints shall be examined.

BCS - Before Cold Stretch ACS - After Cold Stretch BG - After backgrinding to sound weld metal

	5/1/2018	
ENGINEER WELDING	MANAGER QC	TUV SUD
PREPARED BY	REVIEWED & APPROVED BY	REVIEWED BY

TUV SUD SOUTH ASIA PRIVATE LTD. PV (P) 4 19/01/2005 INSPECTOR

TUV SUD SOUTH ASIA PRIVATE LTD. TUV SUD 700

Exhibit No-16
Format No:CAP/WD/F-03 Rev 03
Dated:08.09.2014

CRYOLOR ASIA PACIFIC

WELDING CATALOGUE

PROJECT NO : C290222
VESSEL TYPE : RVTA 19
DRAWING NO: : HC002573 Rev.A

CATALOGUE NO : WC-C290222-REV 00
DATE : 03.11.2017

Weld No	Location of Weld	WPS No.& Rev No	Welding Process	Filler Metal AWS Specification (including brand name)	Preheat temperature (min) / Inter pass temperature (Max) (°C)	Impact test Temperature (°C)	Base metal thickness range		NDE Requirements				
									BCS			ACS	
							(T1)	(T2)	RT	PT (Root)	PT (Final)	RT	PT (Final)
D1, D2, D3, D4 & D5	Nozzle to top Dish end	WPS/CAP-017 Rev 0	GTAW	ER 308L (TIG-120)	16°C / 150°C	-196°C	8.0mm	2.77mm, 3.68mm	Nil	100% (BG)	Nil	Nil	100%
D7, D8, D9,D10, D11 & D12	Nozzle to Bottom Dish end	WPS/CAP-017 Rev 0	GTAW	ER 308L (TIG-120)	16°C / 150°C	-196°C	8.0mm	2.77mm, 3.68mm	Nil	100% (BG)	Nil	Nil	100%
M1a & M1b	Main support plate to Shell	WPS/CAP-017 Rev 0	GTAW	ER 308L (TIG-120)	16°C / 150°C	-196°C	6.7mm	6mm	Nil	Nil	Nil	Nil	100%
M2a, M2b & M2c	Lifting lug to Dish end	WPS/CAP-017 Rev 0	GTAW	ER 308L (TIG-120)	16°C / 150°C	-196°C	8.0mm	12mm	Nil	Nil	Nil	Nil	100%
M4a to M4f	Pipe support rod to Shell	WPS/CAP-017 Rev 0	GTAW	ER 308L (TIG-120)	16°C / 150°C	-196°C	6.7mm	6mm	Nil	Nil	Nil	Nil	100%
M5a to M5h	Support for absorbant bag to Dish end	WPS/CAP-017 Rev 0	GTAW	ER 308L (TIG-120)	16°C / 150°C	-196°C	8.0mm	6mm	Nil	Nil	Nil	Nil	100%
M7a to M7d	Name Plate Support rod to Top Dish end	WPS/CAP-017 Rev 0	GTAW	ER 308L (TIG-120)	16°C / 150°C	-196°C	8.0mm	6.0mm	Nil	Nil	Nil	Nil	100%
M7e to M7h	Name Plate to Support Rod	WPS/CAP-017 Rev 0	GTAW	ER 308L (TIG-120)	16°C / 150°C	-196°C	6.0mm	1.0mm	Nil	Nil	Nil	Nil	Nil
M3a & M3b	Back strip to shell (Top and Bottom)	WPS/CAP-017 Rev 0	GTAW	ER 308L (TIG-120)	16°C / 150°C	-196°C	10.0mm	6.7mm	Nil	Nil	Nil	Nil	Nil

Note:

1) For all Category A joints, the reinforcement shall not exceed 10% of the plate thickness or 3 mm,whichever is less. For all category B joints, the reinforcement shall not exceed 4.0mm, weld edges shall be merged smoothly in to the base metals.

2) For GTAW Process, use Filler Wire Brand: Ador Fontech Limited

3) For tack welding use WPS No: WPS/CAP-017 (Rev 00)

4) For repair welding use WPS No: WPS/CAP-017 (Rev 00)

5) Repair on base meterial shall not be done without AI concurrence.

6) All temporary attachment removal area shall be PT examined

7) Production Test Coupon not required as per UHA 51 (h) (2) & Mandatory Appendix 44-6.1 (g) (3)

8) If the Head contain long seam, (Seam less) (Cat - 'A') welds and all attachments including head to nozzle welds shall be PT examined after Cold Stretch process.

9) If any rejectable defects are detected in the PT Examination of Category A joints and attachment welds then, all category B weld joints shall be examined.

BCS - Before Cold Stretch ACS - After Cold Stretch BG - After backgrinding to sound weld metal

	3/11/2017	
ENGINEER WELDING	MANAGER QC	TUV SUD
PREPARED BY	REVIEWED & APPROVED BY	REVIEWED BY

TUV SUD SOUTH ASIA PRIVATE LTD. PV (R) 444 19/01/2005 INSPECTOR

TUV SUD SOUTH ASIA PRIVATE LTD. TUV SUD 700