

REPORT NO : 20131230-070 1 OF 1
 DATE : 'Dec. 30. 2013
 ARTICLE : GATE PSB-A BWE CL900 WCB/13CR(FS)
 P/O NO. : 3631
 MFG. NO. : 13-00823-008

INSPECTION CERTIFICATE

(CHEMICAL, PHYSICAL & HYDROSTATIC)

TAG NO : TNC-3631-008

SIZE : NPS 8 Q'ty : 2 Pcs .

PK VALVE CO.,LTD.
 192-1 Shinchon-Dong, Seongsan-Gu
 Changwon-city, Korea
 Head Office TEL(Inf. Phone) : 055 - 268 - 3777
 & Factory (Q.C Dept) : 055 - 268 - 3788
 FAX : 055 - 286 - 2112
 Homepage <http://www.pkvalve.co.kr>
 E-mail : als7als7@pkvalve.co.kr

PARTS NAME	Body(BD)	Bonnet(BN)	Disc(DS)	Body Seatriring	Stem
MATERIAL	ASTM	A216-WCB	A216-WCB	A576-1020+STL.6	A479-410

DIMENSION INSPECTION (ASME B16.10 & APPROVED DRAWING) (mm)						PRESSURE TEST (API 598)			VISUAL TEST
INSPECTION	Face to Face (End to End)	A (Outside of dia.)	B (Inside of dia.)	T (Thick. of pipe nozzle)	a (Angle of beveling)	SHELL (PSIG)	SEAT(WATER) (PSIG)	BACK SEAT (PSIG)	VISUAL
STANDARD	660.4	219.1	182.5	18.26	37.5	3375	2475	2475	MSS-SP-55
RESULT	*W.T	W.T	W.T	W.T	W.T	GOOD	GOOD	GOOD	GOOD

* W.T : Within Tolerance

HEAT NO.	PARTS	Q'TY	CHEMICAL COMPOSITION (MAX. %) (ASTM STD.)													TENSION TEST(MIN.) (ASTM)				HARDNESS	REMARKS
																T.S (N/mm ²)	Y.P (N/mm ²)	EL. %	R.A %		
STANDARD	A216 WCB		C	Si	Mn	P	S	Ni	Cr	Mo	Cu	V				485 655	250	22.0	35.0		
69C36	BODY	-	0.19	0.50	0.78	0.016	0.006	0.08	0.10	0.03	0.06	0.01				525	378	42.1	64.3		
69F16	BN/DS	-	0.18	0.50	0.76	0.016	0.006	0.07	0.29	0.06	0.06	0.02				555	314	38.3	59.3		
69214	DISC	-	0.19	0.53	0.86	0.019	0.008	0.08	0.13	0.07	0.05	0.02				526	304	38.2	59.3		

BLANK

REMARKS : IN ACCORDANCE WITH EN 10204 TYPE 3.1
 HEAT TREATMENT : WCB : NORMALIZING 925℃ X 2HR(A.C)
 BODY SEATRING & DISC : WELDING FACED WITH STELLITE.6

Manager, Q.C Department *J. S. Moon*
 Witness Inspector

We hereby certify that the above items have been tested and inspected in accordance with relevant codes and specifications.

방사선 투과 시험 보고서

REPORT OF RADIOGRAPHIC EXAMINATION

☒ Casting 주조품 ☐ Weldments 용접품



(주) 한국 산업 기술 연구소

HANKUK INDUSTRIAL TECHNOLOGY CO., LTD.

창원시 중앙동 47-12 창원우체국 사서함 186호

전화 : 055-266-4400(代) 전송 : 055-266-6900

보고서번호
Report No. HITCO-PK-RT-2013- 992

페이지번호
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발 주 처
Customer TNC

품 명 Item	GATE VALVE		공 사 명 Project Name	HUSKY OIL CANADA P.O No.: 3631 PK JOB No.: 13-00823	
부 품 Part	GATE 900# 8" BODY/BONNET		도 면 번 호 Dwg. No.	1300823 Rev.1	
재 질 Material	WCB		재 질 두께 Mat'l Thickness	SEE ATTACHED SHEET	
필름 종류 Film Type	KODAK# T200 TYPE. I KODAK# AA400 TYPE. II		촬영 위치 Shooting Position	☒ 단일벽 ☐ 이중벽 ☐ 원환식 Single Double Panoramic	
방사성 동위원소 Radioisotope	☒ Ir -192 38 Ci N131197 ☒ Co-60 65 Ci 46508B		X-선 발생장치 X-ray	적용전압/전류 N/A KVP Applied Volt/Amp N/A m A	
γ-ray	선원크기 2.7 × 2.25 mm (Ir-192) Source Size 3.81 × 4.216mm (CO-60)			초점크기 N/A ☐ inch Focal. Size N/A ☐ mm	
필름 규격 Film Size	4½ × 12" 10 × 12" ☒ inch ☐ mm		거 리 FFD/SPD	SEE ATTACHED SHEET	
투과도계 Penetrameter	SEE ATTACHED SHEET		노출 시간 Exposure time	SEE ATTACHED SHEET	
감 도 Sensitivity	2-2T		현상 조건 Development	20 °C 5 min.	
납중감지 Pb. Screen	Front 0.010/:Back 0.010(Co) ☒ inch Front 0.005/:Back 0.005(Ir) ☐ mm		산란방지납판 Lead Backing	☒ Yes 유 ☐ No 무	
판 독 View	☒ Single 한 장 ☒ Double 두 장		흑화도 Density	1.5-4.0(S) 1.0-4.0(D)	
적용표준 Code/Standard	ASME SEC.V/ ASME B16.34 APPENDIX I ASTM-E446, E186		절차서 Procedure	HITCO - A0401 Rev.4	
노출수 Number of Exposure	48		필름/카세트수 Number of Film/Cassette	☒ One ☒ Two	

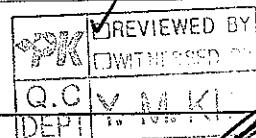
Sketch

SEE ATTACHED SHEET

PK ITEM No.: 008

비 고
Remarks TAG NO. TNC-3631-008

Examined by M. S. KIM LEVEL. II		작성일자 Date of Report	
검 사 자 김 민 식		시험일자 Date of Examined 2013. 10.02	
Apporved by D. J. BAE LEVEL. III		Witnessed by	
책 임 자 배 대 중		Reviewed by	



REPORT OF RADIOGRAPHIC EXAMINATION

☒ Casting

☐ Weldments



HANKUK INDUSTRIAL TECHNOLOGY CO., LTD.
#47-12, JungAng-Dong, P.O Box 186,
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TEL : 055-266-4400(代) FAX: 055-266-6900

Report No. HITC-PK-RT-2013- 992

Page No. 2 of 4

GATE 900# 8"	<table border="1"> <tr> <td rowspan="4">BDT A"</td> <td>Mat'l thickness</td> <td>85</td> <td>mm</td> </tr> <tr> <td>SOD/SOF</td> <td>203/85</td> <td>mm</td> </tr> <tr> <td>Exposure time</td> <td colspan="2">1 min. 19 sec</td> </tr> <tr> <td>Penetrameter</td> <td>No. 60</td> <td> ☒ Source Side ☐ Film Side </td> </tr> <tr> <td rowspan="4">BDR BDL A"</td> <td>Mat'l thickness</td> <td>52</td> <td>mm</td> </tr> <tr> <td>SOD/SOF</td> <td>203/52</td> <td>mm</td> </tr> <tr> <td>Exposure time</td> <td colspan="2">41 sec</td> </tr> <tr> <td>Penetrameter</td> <td>No. 40</td> <td> ☒ Source Side ☐ Film Side </td> </tr> <tr> <td rowspan="4">BD A"</td> <td>Mat'l thickness</td> <td>40/53</td> <td>mm</td> </tr> <tr> <td>SOD/SOF</td> <td>203/40, 53</td> <td>mm</td> </tr> <tr> <td>Exposure time</td> <td colspan="2">32 sec</td> </tr> <tr> <td>Penetrameter</td> <td>No. 30, 40</td> <td> ☒ Source Side ☐ Film Side </td> </tr> <tr> <td rowspan="4">BN D"</td> <td>Mat'l thickness</td> <td>65</td> <td>mm</td> </tr> <tr> <td>SOD/SOF</td> <td>335/65</td> <td>mm</td> </tr> <tr> <td>Exposure time</td> <td colspan="2">1 min. 21 sec</td> </tr> <tr> <td>Penetrameter</td> <td>No. 50</td> <td> ☒ Source Side ☐ Film Side </td> </tr> </table>	BDT A"	Mat'l thickness	85	mm	SOD/SOF	203/85	mm	Exposure time	1 min. 19 sec		Penetrameter	No. 60	☒ Source Side ☐ Film Side	BDR BDL A"	Mat'l thickness	52	mm	SOD/SOF	203/52	mm	Exposure time	41 sec		Penetrameter	No. 40	☒ Source Side ☐ Film Side	BD A"	Mat'l thickness	40/53	mm	SOD/SOF	203/40, 53	mm	Exposure time	32 sec		Penetrameter	No. 30, 40	☒ Source Side ☐ Film Side	BN D"	Mat'l thickness	65	mm	SOD/SOF	335/65	mm	Exposure time	1 min. 21 sec		Penetrameter	No. 50	☒ Source Side ☐ Film Side
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방사선 투과 시험 보고서

REPORT OF RADIOGRAPHIC EXAMINATION

☒ Casting 주조품

☐ Weldments 용접품



(주) 한국 산업 기술 연구 소
HANKUK INDUSTRIAL TECHNOLOGY CO., LTD.
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전화 : 055-266-4400(代) 전송 : 055-266-6900

보고서번호 HITCO-PK-RT-2013-992
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필름확인 번호 FILM ID No. 13-00823-008	필름번호 Film No.	등급 Grade	합 격 Accept	불 합 격 Reject	기 공 Gas porosity	슬 래 그 Slag Inclusion	모 래 물 림 Sand Inclusion	수 축 관 Shrinkage					균 열 Crack	열간균열 Hot Tear	인서트 Insert	모 틀 링 Mottling	표면거칠기 Surface Roughness	비 고 Remarks	
								Linear	Dendr ite	Type 1	Type 2	Type 3							Type 4
					①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	
GATE 900# 8" BD1 BDT	0-1	1	v				1												
	1-2	NONE	v																
	2-3	NONE	v																
	3-4	NONE	v																
	4-5	NONE	v																
	5-0	NONE	v																
BDR	0-1	NONE	v																
	1-2	NONE	v																
	2-3	NONE	v																
	3-4	NONE	v																
	4-0	1	v				1												
BDL	0-1	NONE	v														V		
	1-2	1	v				1												
	2-3	2	v				2												
	3-4	NONE	v																
	4-0	1	v				1												
BD	0-1	NONE	v																
	1-2	1	v				1										V		
	2-3	1	v				1										V		
	3-4	NONE	v																
BN	0-1	NONE	v																
	1-2	NONE	v																
	2-3	NONE	v																
	3-0	NONE	v																
GATE 900# 8" BD2 BDT	0-1	1	v				1												
	1-2	1	v				1												
	2-3	NONE	v																
	3-4	NONE	v																
	4-5	NONE	v																
	5-0	NONE	v																

방사선 투과 시험 보고서

REPORT OF RADIOGRAPHIC EXAMINATION

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보고서번호 HITCO-PK-RT-2013-992
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페이지번호 4 of 4
Page No.

필름확인 번호 FILM ID No.	필름번호 Film No.	등급 Grade	합격 Accept	불합격 Reject	기공 Gas porosity	슬래그 Slag Inclusion	모래물림 Sand Inclusion	수축관 Shrinkage					균열 Crack	열간균열 Hot Tear	인서트 Insert	모틀링 Mottling	표면거칠림 Surface Roughness	비고 Remarks	
								Linear	Dendrite	Type 1	Type 2	Type 3							Type 4
13-00823-008					①	②	③												
GATE 900# 8" BD2 BDR	0-1	NONE	v																
	1-2	NONE	v																
	2-3	NONE	v																
	3-4	NONE	v																
	4-0	NONE	v																
BDL	0-1	2	v				2												
	1-2	NONE	v																
	2-3	NONE	v																
	3-4	NONE	v																
	4-0	NONE	v																
BD	0-1	NONE	v																
	1-2	1	v		1														
	2-3	1	v		1														
	3-4	NONE	v																
BN	0-1	NONE	v																
	1-2	NONE	v																
	2-3	NONE	v																
	3-0	NONE	v																
							=	B	L	A	N	K	=						

자분탐상보고서 (A)

REPORT OF MAGNETIC PARTICLE EXAMINATION

☒ Casting 주조품 ☐ Weldments 용접품



(주) 한국 산업 기술 연구소
HANKUK INDUSTRIAL TECHNOLOGY CO., LTD.
창원시 중안동 47-12 창원우체국 사서함 186호
전화 : 055-266-4400(代) 전송 : 055-266-6900

보고서 번호 HITCO-PK-MT-2013-363

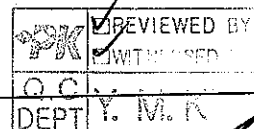
Report No.

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사 업 명 Project Name				고 객 Customer		공 사 번 호 Work No.	
HUSKY OIL CANADA				TNC		P.O No.: 3631 PK JOB No.: 13-00823	
품명/번호 Item Name / No.				부품 Part		도면번호 DWG. No.	
GATE, TDCV VALVE				BODY/ BONNET		1300823 Rev.1	
시험장비 Testing Equip. Type				TRV No. Operation No.		절차서 Procedure	
YOKE				N/A		HITCO-A0403 Rev.4	
재 질 Material				표면상태 Surface Condition		적용규격 Applied Spec.	
WCB				AS CASTING		ASME SEC.V/ ASME B16.34 APPENDIX II	
자외선강도 B/Light Intensity / No.				조 도 Illumination		시험온도 Test Temp.	
Min.: 1,200μW/cm ² S/No.: NW0201				Max.: 20 Lux(Fluorescent)		20 °C	
장비 Equipment : HANDY MAG 확인번호 ID No. : NW 5221 상 품 명 Brand : NAWOO TECH LTD. 모 델 Model No. : MY-2 출 력 Out put : 220V L/P:4.8kg 유효 일 Due Date: 2014.09.26				자화방법 Magnetization ☐ Prod(프로드) ☒ Wet(습식) ☒ Yoke(요오크) ☐ Dry(건식) ☐ Coil코일 ☐ Color (비형광) ☒ AC(교류) ☒ Fluorescent(형광) ☐ DC HWDs 직류반파정류		극간거리 Spacing :	
						2-5 inch	
						전류 Current Power :	
						AC: 2.6A	
						통전법 ☒ Cont.	
Applying Current ☐ Residual							
탈자 ☐ Yes							
Demagnetization ☒ No							
Direction ☐ Circular원형 ☒ Long. 선형 자화방향 ☐ Both 혼잡형				비교 시험편 Ref. / Test Piece ASME Field Indicator		Maker 제조처 :	
KYUNG DO LTD							
						Type 형 태 :	
						14-AM (CAN)	
Ident. No.	Q'ty	Acc	Rej	INTERPRETATION	CHECK POSITION	TAG No.	PK ITEM No.
GATE 900# 10"	12 EA	V		NO SIGNIFICANT DEFECT	BODY	TNC-3631-005	005
	12 EA	V		NO SIGNIFICANT DEFECT	BONNET	"	"
GATE 900# 8"	2 EA	V		NO SIGNIFICANT DEFECT	BODY	TNC-3631-008	008
	2 EA	V		NO SIGNIFICANT DEFECT	BONNET	"	"
TDCV 900# 8"	1 EA	V		NO SIGNIFICANT DEFECT	BODY	TNC-3631-010	010
	1 EA	V		NO SIGNIFICANT DEFECT	BONNET	"	"
GATE 900# 6"	2 EA	V		NO SIGNIFICANT DEFECT	BODY	TNC-3631-013	013
	2 EA	V		NO SIGNIFICANT DEFECT	BONNET	"	"
Examined by M. S. KIM LEVEL. II 검 사 자 김 민 식				☒ 시험시간 Time Examination 08:30-17:00 ☒ 시험일자 Date of Examined 2013.10.02 ~ 2013.10.11			
Apporved by D. J. BAE LEVEL. III 책 임 자 배 대 중				☐ Witnessed by ☐ Reviewed by			



액체 침투 탐상 보고서(A)

REPORT OF LIQUID PENETRANT EXAMINATION

☐ Casting 주조품 ☒ Weldments 용접품



(주) 한국 산업 기술 연구소

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창원시 중앙동 47-12 창원우체국 사서함 186호

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보고서 번호

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Report No.

페이지 번호

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사업명 Project Name				고객 Customer				공사번호 Work No.			
HUSKY OIL CANADA				TNC				P.O No.: 3631 PK JOB No.: 13-00823			
품명/번호 Item Name / No.				부품 Part				도면번호 DWG. No.			
GATE, TDCV VALVE				DISC, BODY SEAT RING, BACK SEAT, BODY SEAL WELD				1300823 Rev.1			
침투탐상 시험공정 Process of PT				TRV No. Operation No.				절차서 Procedure			
VISIBLE-SOLVENT REMOVABLE				N/A				HITCO-A0404 Rev.4			
재질 Material				표면상태 Surface Condition				적용규격 Applied Spec.			
WCB, A216-WCB+STL.6, A576-1020+STL.6				AS MACHINED/ AS GROUND				ASME SEC V Art.6 ASME SEC.VIII Div.1 APPENDIX.8			
자외선강도 B/Light Intensity / No.				조도 Illumination				시험온도 Test Temp.			
N/A μW/cm ² No.: / N/A				Min. 1,000 Lux				12 °C			
침투제		상표 Brand		형태 Type		제조번호 Batch No.		적용 Apply		☐ 솔질 Brush ☒ 분사 Spray ☐ 침적 Immerse	
Penetrant		KYUNG DO		P-2		133022				침투시간 Penetration 12 min.	
세척제		상표 Brand		형태 Type		제조번호 Batch No.		적용 Apply		☐ 솔질 Brush ☐ 분사 Spray ☐ 침적 Immerse	
Remover		KYUNG DO		R-1,3		133052				제거 Remove Handwipe Wash	
현상제		상표 Brand		형태 Type		제조번호 Batch No.		적용 Apply		☐ 솔질 Brush ☒ 분사 Spray ☐ 침적 Immerse	
Developer		KYUNG DO		D-4		133082				흡출시간 Bleed out 12 min.	
Ident. No.	Q'ty	Acc	Rej	INTERPRETATION		CHECK POSITION		TAG No.		PK ITEM No.	
GATE 900# 10"	12 EA	V		NO SIGNIFICANT DEFECT		DISC + STL.6		TNC-3631-005		005	
	12 EA	V		NO SIGNIFICANT DEFECT		BODY SEAT RING + STL.6		"		"	
	12 EA	V		NO SIGNIFICANT DEFECT		BACK SEAT + STL.6		"		"	
	12 EA	V		NO SIGNIFICANT DEFECT		BODY SEAL WELD		"		"	
GATE 900# 8"	2 EA	V		NO SIGNIFICANT DEFECT		DISC + STL.6		TNC-3631-008		008	
	2 EA	V		NO SIGNIFICANT DEFECT		BODY SEAT RING + STL.6		"		"	
	2 EA	V		NO SIGNIFICANT DEFECT		BACK SEAT + STL.6		"		"	
	2 EA	V		NO SIGNIFICANT DEFECT		BODY SEAL WELD		"		"	
Examined by M. S. KIM				LEVEL. II				☒ 시험시간 Time Examination 08:30~17:00 ☒ 시험일자 Date of Examined 2013.12.12 ~ 2013.12.13			
검 사 자 김 민 식								☐ Witnessed by ☐ Reviewed by			
Apporved by D. J. BAE				LEVEL. III				REVIEWED BY WITNESSED BY Q.C DEPT Y. M. KIM			
책 임 자 배 대 중											

액체 침투 탐상 보고서(B)

REPORT OF LIQUID PENETRANT EXAMINATION

☐ Casting 주조품 ☒ Weldments 용접품

(주) 한국 산업 기술 연구소

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