MISTRAS GROUP INC.
Services Division
Formerly... iTi
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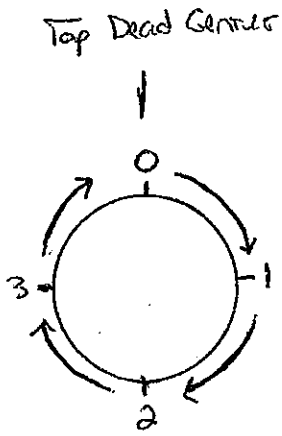
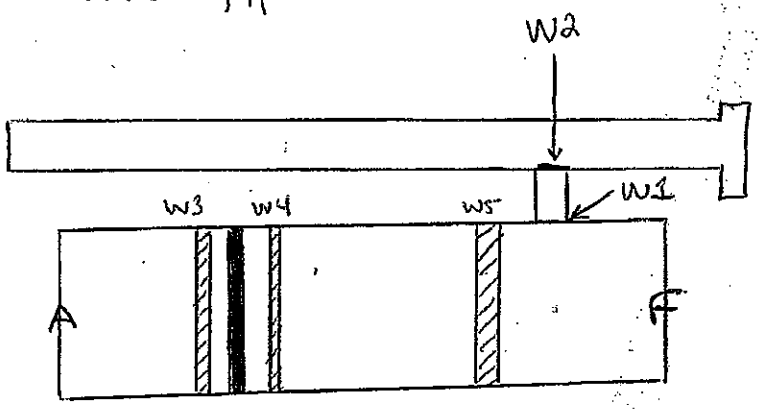
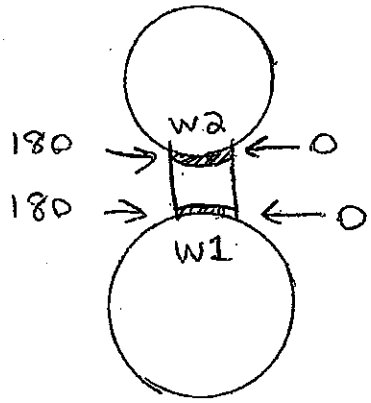
401 N. Main Street • Manchester, PA 17345
www.mistrasgroup.com

Inspection A
welds 3,4,5





Inspection B
welds 1,2



* All Views are from the A end per DWG B00000000812765 Rev. A

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RADIOGRAPHIC INSPECTION REPORT

REPORT NO.	MISTRAS PROJECT #	PURCHASE ORDER:
RT 9-21-1	268055	32731-7045

CLIENT	CUSTOMER:	WELD #:
Incodema	Incodema	Weld #1 & 2
REPORT TEMPLATE: Pipe	TEST NO:	DWG: D00000000812765

COMPONENT AND SPECIFICATION DATA

COMPONENT		SEAM:	WELD PROCESS:
2" Schedule 10 Pipe		Circumferential Weld	N/A
MATERIAL TYPE: 13-8 Mo (Titanium)	SINGLE WALL TK.: .109" + Reinf	REPAIR: None	FILLER METAL: E-7018
EXAMINATION SPECIFICATION: ASME Section V		ACCEPTANCE STD.: ASME VIII (UW-51)(100%)	RT PROCEDURE: 100-RT-001 REV. 5

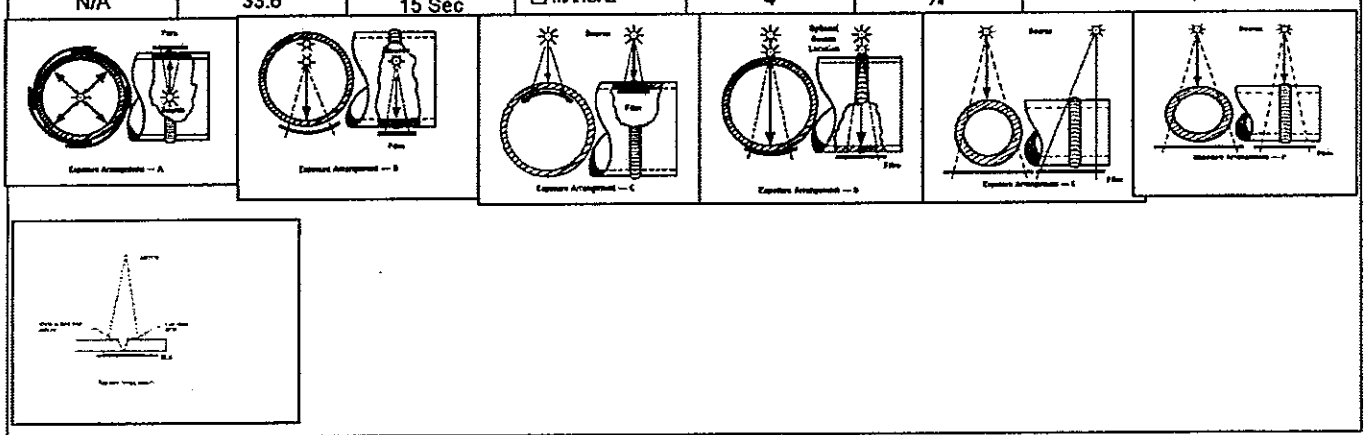
TECHNIQUE DATA

IQI TYPE	IQI DESIGNATION	IQI MATERIAL	SENSITIVITY	IQI LOCATION
ASTM Wire Set	Set A	Titanium	2-2T .006" Dia. Wire	FILM SIDE ☒ SOURCE SIDE ☐

IQI SELECTION BASED ON	IQI ON	SHIM(S) BLOCK(S)		SCREEN THICKNESS
Weld Thickness	☒ PART ☐ BLOCK(S)	N/A	☐ X-RAY ☒ Ir. 192 ☐ Co. 60	FRONT .005" CENTER-BACK .010"

S.F.D	S.O.D.	O.F.D.	FOCAL SIZE	µG	FILM TYPE(S)	NO. FILM IN	FILM SIZE
15"	12.625"	2.375"	.154"	Acceptable	AGFA D3	CASSETTE 1	5" x 7"

KV	CURIES	EXP. TIME	FILM PROCESSING	# OF EXPOSURES	BACKING LEAD	RADIOGRAPH TECHNIQUE
N/A	33.6	3 Min 15 Sec	☒ AUTOMATIC ☐ MANUAL	4	¼"	F



INTERPRETATION DATA

RADIOGRAPH IDENTIFICATION	RADIOGRAPH LOCATION	ACCEPT	REJECT	N.A.D.	SURFACE COND.	*DISCONTINUITY CODE	LOCATION AND SIZE OF CONDITIONS
Weld #1	0°	✓		✓			artifacts
	180°	✓		✓			artifact
Weld #2	0°	✓		✓			
	180°	✓		✓			artifacts

Juan Espada — MISTRAS TECHNICIAN | II — LEVEL | 9-21-10 — DATE

CLIENT REVIEWER | LEVEL | DATE

*DISCONTINUITY CODE (CIRCLE REJECT CONDITION)

1 Porosity
2 Slag Inclusion
3 Tungsten Inclusion
4 Lack of Fusion
5 Lack of Penetration
6 Crack
7 Burn Through
8 Hollow Bead
9 Concave Root
10 Convex Root
11 Inside Undercut
12 Outside Undercut
13 High Low
14 Low Crown
15 Drop Through
16 Whisker
17 Oxidation

NAD - NO APPARENT DISCONTINUITIES
Ug - GEOMETRIC UNSHARPNESS
SFD - SOURCE TO FILM DISTANCE
SOD - SOURCE TO OBJECT DISTANCE
OFD - OBJECT TO FILM DISTANCE

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RADIOGRAPHIC INSPECTION REPORT

REPORT NO.	MISTRAS PROJECT #	PURCHASE ORDER:
RT 9-7-1	266160	21018

CLIENT	CUSTOMER:	WELD #:
Arc Applications	Incodema	Weld #3 & 4
REPORT TEMPLATE: Helium Vessel	TEST NO: 21018	DWG: D00000000812815

COMPONENT AND SPECIFICATION DATA

COMPONENT		SEAM:	WELD PROCESS:
9.25" OD Vessel		Circumferential Weld	N/A
MATERIAL TYPE: 13-8 Mo (Titanium)	SINGLE WALL TK.: .102" + Reinf	REPAIR: None	FILLER METAL: E-7018
EXAMINATION SPECIFICATION: ASME Section V		ACCEPTANCE STD.: ASME VIII (UW-51)(100%)	RT PROCEDURE: 100-RT-001 REV.: 5

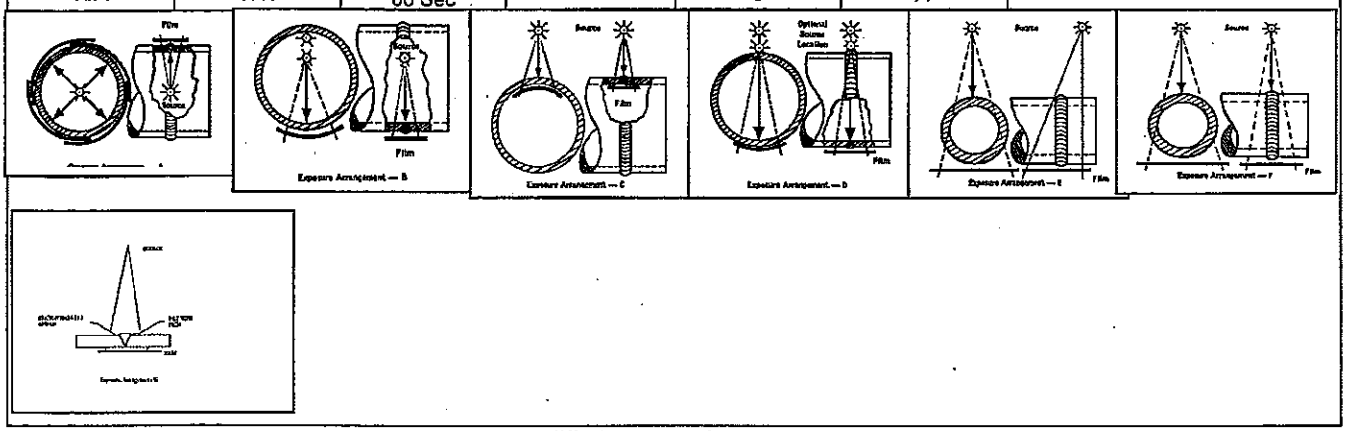
TECHNIQUE DATA

IQI TYPE	IQI DESIGNATION	IQI MATERIAL	SENSITIVITY	IQI LOCATION
ASTM Wire Set	Set A	Titanium	2-2T .006" Dia. Wire	FILM SIDE ☒ SOURCE SIDE ☐

IQI SELECTION BASED ON	IQI ON	SHIM(S) BLOCK(S)		SCREEN THICKNESS
Weld Thickness	☒ PART ☐ BLOCK(S)	N/A	☐ X-RAY ☒ Ir. 192 ☐ Co. 60	FRONT .005" CENTER-BACK .010"

S.F.D	S.O.D.	O.F.D.	FOCAL SIZE	µG ›	FILM TYPE(S)	NO. FILM IN	FILM SIZE
9.25"	9.148"	.102"	.154"	Acceptable	AGFA D3	CASSETTE 1	4 1/2" x 10"

KV	CURIES	EXP. TIME	FILM PROCESSING	# OF EXPOSURES	BACKING LEAD	RADIOGRAPH TECHNIQUE
N/A	37.3	1 Min 00 Sec	☒ AUTOMATIC ☐ MANUAL	8	¼"	F



INTERPRETATION DATA

RADIOGRAPH IDENTIFICATION	RADIOGRAPH LOCATION	ACCEPT	REJECT	N.A.D.	SURFACE COND.	*DISCONTINUITY CODE							LOCATION AND SIZE OF CONDITIONS
Weld #3	0-1	✓				1							Isolated Pore .031"
	1-2		✓			1							.031" & .042" Pore
	2-3	✓				1							.031" Isolated Pore
	3-0	✓				1							.031" Isolated Pore
Weld #4	0-1	✓		✓									
	1-2	✓		✓									
	2-3	✓				1							.031" Isolated Pore
	3-0	✓		✓									

MISTRAS TECHNICIAN	LEVEL	DATE	CLIENT REVIEWER	LEVEL	DATE
[signature]	III	9/7/10			

*DISCONTINUITY CODE (CIRCLE REJECT CONDITION)

1 Porosity
2 Slag Inclusion
3 Tungsten Inclusion
4 Lack of Fusion
5 Lack of Penetration
6 Crack
7 Burn Through
8 Hollow Bead
9 Concave Root
10 Convex Root
11 Inside Undercut
12 Outside Undercut
13 High Low
14 Low Crown
15 Drop Through
16 Whisker
17 Oxidation

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Ug - GEOMETRIC UNSHARPNESS
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RADIOGRAPHIC INSPECTION REPORT

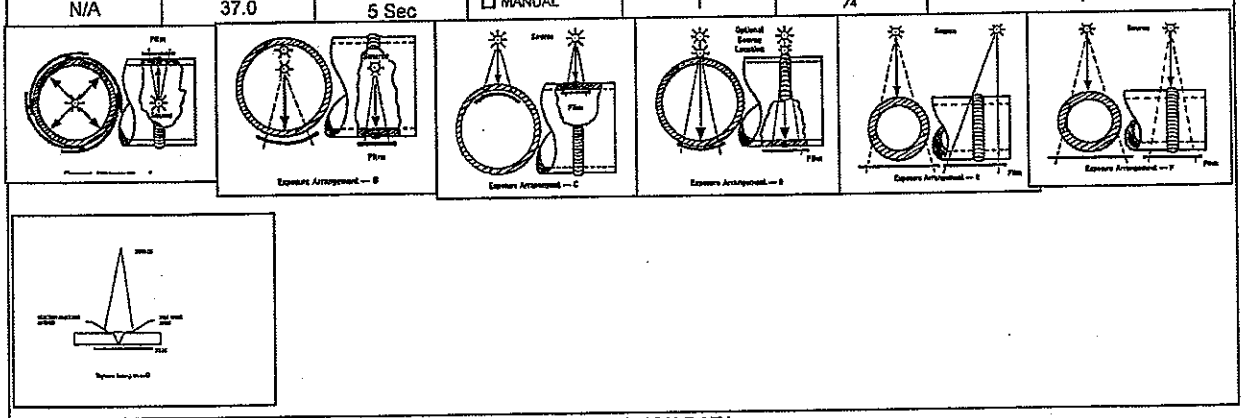
REPORT NO. RT 9-8-1	MISTRAS PROJECT # 266160	PURCHASE ORDER: 21018
CLIENT: Arc Applications	CUSTOMER: Incodema	WELD #: Weld #3
REPORT TEMPLATE: Helium Vessel	TEST NO: 21018	DWG: D00000000812815

COMPONENT AND SPECIFICATION DATA

COMPONENT: 9.25" OD Vessel	SEAM: Circumferential Weld	WELD PROCESS: N/A
MATERIAL TYPE: 13-8 Mo (Titanium) / SINGLE WALL TK: .102" + Reinf	REPAIR: R-1	FILLER METAL: E-7018
EXAMINATION SPECIFICATION: ASME Section V	ACCEPTANCE STD.: ASME VIII (UW-51)(100%)	RT PROCEDURE: 100-RT-001 / REV.: 5

TECHNIQUE DATA

IQI TYPE: ASTM Wire Set	IQI DESIGNATION: Set A	IQI MATERIAL: Titanium	SENSITIVITY: 2-2T .006" Dia. Wire	IQI LOCATION: FILM SIDE ☒ SOURCE SIDE ☐
IQI SELECTION BASED ON: Weld Thickness	IQI ON: ☒ PART ☐ BLOCK(S)	SHIM(S) BLOCK(S): N/A	☐ X-RAY ☒ Ir. 192 ☐ Co. 60	SCREEN THICKNESS: FRONT .005" CENTER-BACK .010"
S.F.D: 9.25" / S.O.D.: 9.148"	O.F.D.: .102"	FOCAL SIZE: .154" / µG: Acceptable	FILM TYPE(S): AGFA D3	NO. FILM IN: CASSETTE 1 / FILM SIZE: 4 1/2" x 10"
KV: N/A / CURIES: 37.0	EXP. TIME: 1 Min 5 Sec	FILM PROCESSING: ☒ AUTOMATIC ☐ MANUAL / # OF EXPOSURES: 1	BACKING LEAD: ¼"	RADIOGRAPH TECHNIQUE: F



INTERPRETATION DATA

RADIOGRAPH IDENTIFICATION	RADIOGRAPH LOCATION	ACCEPT	REJECT	N.A.D.	SURFACE COND.	*DISCONTINUITY CODE	LOCATION AND SIZE OF CONDITIONS
Weld #3	1-2	✓					Isolated Pore .031"

MISTRAS TECHNICIAN — LEVEL III — DATE 9/8/10

CLIENT REVIEWER — LEVEL — DATE

*DISCONTINUITY CODE (CIRCLE REJECT CONDITION)

1 Porosity
2 Slag Inclusion
3 Tungsten Inclusion
4 Lack of Fusion
5 Lack of Penetration
6 Crack
7 Burn Through
8 Hollow Bead
9 Concave Root
10 Convex Root
12 Outside Undercut
13 High Low
14 Low Crown
15 Drop Through
16 Whisker

NAD - NO APPARENT DISCONTINUITIES
Ug - GEOMETRIC UNSHARPNESS
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RADIOGRAPHIC INSPECTION REPORT

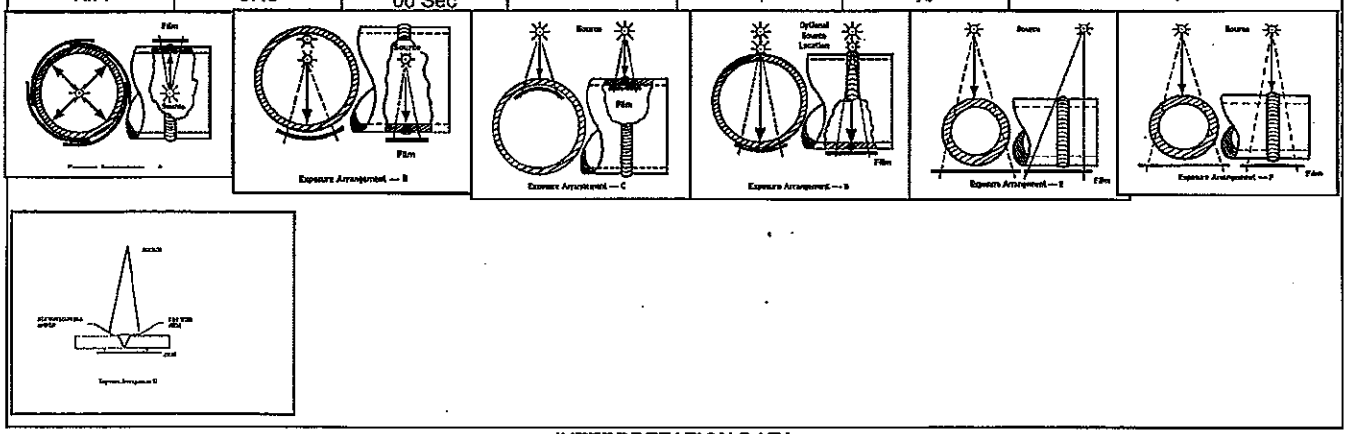
REPORT NO. RT 9-7-2	MISTRAS PROJECT # 266160	PURCHASE ORDER: 21018
CLIENT: Arc Applications	CUSTOMER: Incodema	WELD #: Weld #5
REPORT TEMPLATE: Helium Vessel	TEST NO: 21018	DWG: D00000000812815

COMPONENT AND SPECIFICATION DATA

COMPONENT: 9.25" OD Vessel		SEAM: Circumferential Weld	WELD PROCESS: N/A
MATERIAL TYPE: 13-8 Mo (Titanium)	SINGLE WALL TK.: .195" + Reinf	REPAIR: None	FILLER METAL: E-7018
EXAMINATION SPECIFICATION: ASME Section V		ACCEPTANCE STD.: ASME VIII (UW-51)(100%)	RT PROCEDURE: 100-RT-001 REV.: 5

TECHNIQUE DATA

IQI TYPE: ASTM Wire Set		IQI DESIGNATION: Set A	IQI MATERIAL: Titanium	SENSITIVITY: 2-2T .006" Dia. Wire		IQI LOCATION: FILM SIDE ☒ SOURCE SIDE ☐
IQI SELECTION BASED ON: Weld Thickness		IQI ON: ☒ PART ☐ BLOCK(S)	SHIM(S) BLOCK(S): N/A		☐ X-RAY ☒ Ir. 192 ☐ Co. 60	SCREEN THICKNESS: FRONT .005" CENTER-BACK .010"
S.F.D: 9.25"	S.O.D.: 9.055"	O.F.D.: .195"	FOCAL SIZE: .154"	µG: Acceptable	FILM TYPE(S): AGFA D3	NO. FILM IN: CASSETTE 1 / FILM SIZE: 4 1/2" x 10"
KV: N/A	CURIES: 37.3	EXP. TIME: 1 Min 00 Sec	FILM PROCESSING: ☒ AUTOMATIC ☐ MANUAL	# OF EXPOSURES: 4	BACKING LEAD: ¼"	RADIOGRAPH TECHNIQUE: F



INTERPRETATION DATA

RADIOGRAPH IDENTIFICATION	RADIOGRAPH LOCATION	ACCEPT	REJECT	N.A.D.	SURFACE COND.	*DISCONTINUITY CODE							LOCATION AND SIZE OF CONDITIONS
Weld #5	0-1	✓		✓									
	1-2	✓				1							.031" Iso Pore
	2-3	✓		✓									
	3-0	✓				1							.031" Isolated Pore

MISTRAS TECHNICIAN: [signature] LEVEL: III DATE: 9/7/10

CLIENT REVIEWER: _____ LEVEL: _____ DATE: _____

*DISCONTINUITY CODE (CIRCLE REJECT CONDITION)

1 Porosity
2 Slag Inclusion
3 Tungsten Inclusion
4 Lack of Fusion
5 Lack of Penetration
6 Crack
7 Burn Through
8 Hollow Bead
9 Concave Root
10 Convex Root
11 Inside Undercut
12 Outside Undercut
13 High Low
14 Low Crown
15 Drop Through
16 Whisker
17 Oxidation

NAD - NO APPARENT DISCONTINUITIES
Ug - GEOMETRIC UNSHARPNESS
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RADIOGRAPHIC INSPECTION REPORT

REPORT NO.	MISTRAS PROJECT #	PURCHASE ORDER:
RT 9-7-2	266160	21018

CLIENT	CUSTOMER:	WELD #:
Arc Applications	Incodema	Weld #5
REPORT TEMPLATE	**TEST NO:**	**DWG:**
Helium Vessel	21018	D00000000812815

COMPONENT AND SPECIFICATION DATA

COMPONENT		SEAM:		WELD PROCESS:
9.25" OD Vessel		Circumferential Weld		N/A
MATERIAL TYPE	SINGLE WALL TK.	REPAIR:		FILLER METAL:
13-8 Mo (Titanium)	.195" + Reinf	None		E-7018
EXAMINATION SPECIFICATION		ACCEPTANCE STD.		RT PROCEDURE / REV.
ASME Section V		ASME VIII (UW-51)(100%)		100-RT-001 / 5

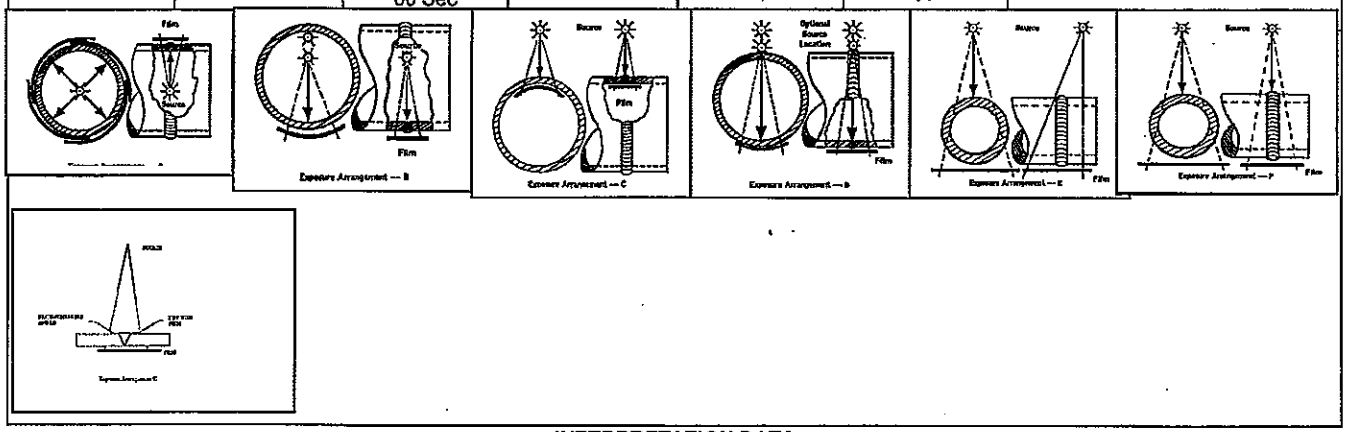
TECHNIQUE DATA

IQI TYPE	IQI DESIGNATION	IQI MATERIAL	SENSITIVITY	IQI LOCATION
ASTM Wire Set	Set A	Titanium	2-2T .006" Dia. Wire	FILM SIDE ☒ SOURCE SIDE ☐

IQI SELECTION BASED ON	IQI ON	SHIM(S) BLOCK(S)		SCREEN THICKNESS
Weld Thickness	☒ PART ☐ BLOCK(S)	N/A	☐ X-RAY ☒ Ir. 192 ☐ Co. 60	FRONT .005" CENTER-BACK .010"

S.F.D	S.O.D.	O.F.D.	FOCAL SIZE	µG	FILM TYPE(S)	NO. FILM IN	FILM SIZE
9.25"	9.055"	.195"	.154"	Acceptable	AGFA D3	CASSETTE 1	4 1/2" x 10"

KV	CURIES	EXP. TIME	FILM PROCESSING	# OF EXPOSURES	BACKING LEAD	RADIOGRAPH TECHNIQUE
N/A	37.3	1 Min 00 Sec	☒ AUTOMATIC ☐ MANUAL	4	¼"	F



INTERPRETATION DATA

RADIOGRAPH IDENTIFICATION	RADIOGRAPH LOCATION	ACCEPT	REJECT	N.A.D.	SURFACE COND.	*DISCONTINUITY CODE							LOCATION AND SIZE OF CONDITIONS
Weld #5	0-1	✓		✓									
	1-2	✓				1							.031" Iso Pore
	2-3	✓		✓									
	3-0	✓				1							.031" Isolated Pore

MISTRAS TECHNICIAN	LEVEL	DATE	CLIENT REVIEWER	LEVEL	DATE
[signature]	III	9/7/10			

*DISCONTINUITY CODE (CIRCLE REJECT CONDITION)

1 Porosity
2 Slag Inclusion
3 Tungsten Inclusion
4 Lack of Fusion
5 Lack of Penetration
6 Crack
7 Burn Through
8 Hollow Bead
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