



**CERTIFICATES OF CONFORMANCE
2012**

**Select Arc, Inc
600 Enterprise Drive
P.O. Box 259
Fort Loramie, Oh 45845**

INDEX

<u>Product</u>	<u>Specification</u>	<u>Classification</u>
<u>Flux Cored Electrodes</u>		
Select 71	AWS A5.20	E70T-1C, T-9C
Select 97	"	E70T-1C, T-9C
Select 70TR	"	E70T-1C, T-9C
Select 720HP	"	E71T-12MJ
Select 720HP	"	E71T-12CJ-H4
Select 720	"	E71T-1M, T-1MJ, T-9M, T-9MJ
Select 720	"	E71T-1C, T-1CJ, T-9C, T-9CJ, T-12C, T-12CJ
Select 720A	"	E71T-9C
Select 720AR	"	E71T-9C
Select 727	"	E71T-1M, T-1MJ, T-9M, T-9MJ
Select 727	"	E71T-1C, T-1CJ, T-9C, T-9CJ, T-12C, T-12CJ
Encore	"	E71T-1M, T-9M
Encore	"	E71T-1C, T-9C
Select 810-Ni1	AWS 5.29	E81T1-Ni1MJ
Select 810-Ni1	"	E81T1-Ni1CJ
Select 810-Ni2	"	E81T1-Ni2M
Select 810-Ni2	"	E81T1-Ni2C
Select 810-W	"	E81T1-W2M
Select 810-W	"	E81T1-W2C
Select 820-Ni1	"	E81T1-Ni1MJ
Select 820-Ni1	"	E81T1-Ni1CJ
Select 920-Ni1	"	E91T1-GC
Select 111-K3C	"	E111T1-K3CJ
<u>Solid and Metal Cored Electrodes</u>		
Select 70C-3	AWS 5.18	E70C-3M
Select 70C-6 (75Ar/25CO2)	"	E70C-6M
Select 70C-6 (90Ar/10CO2)	"	E70C-6M
Select 70C-6LS	"	E70C-6M-H4
Select 70C-T	"	E70C-6M
Select ER70S-3	"	ER70S-3
Select ER70S-6	"	ER70S-6
<u>Submerged Arc Electrodes</u>		
Select ENi1S (Lincoln 960 flux)	AWS A5.23	ECNi1



CERTIFICATE OF CONFORMANCE

Manufactured in the U.S.A. by :
SELECT-ARC, INC.
 600 Enterprise Dr.
 P. O. Box 259
 Fort Loramie, OH 45845

Supplied to :

Date:
 Customer Order Number :
 Order Number :
 Weight :
 Lot/ Production No. Shipped:

This is to certify that **Select 71** electrode, classification **E70T-1C, T-9C**, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used for testing on **February 13, 2012**. All tests required by specifications **AWS A5.20/ASME SFA-5.20**, for wire diameters .045" through 3/32", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus
Requirements:	0.12 max.	1.75 max.	0.90 max.	0.03 max.	0.03 max.
Deposit Analysis: 3/32" dia.	0.05	1.46	0.65	0.012	0.009
.045" dia.	0.05	1.62	0.75	0.007	0.008

RADIOGRAPHIC TESTS

Met requirements

FILLET WELD TESTS

Met requirements

MECHANICAL PROPERTIES

AS WELDED

STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in):	3/32	.045
Amperage:	385	225
Arc Voltage:	30	29
Current Polarity:	DCEP	DCEP
Electrical Extension (in):	1	3/4
Shielding Gas:	CO ₂	CO ₂
No. of Passes/Layers:	10/5	11/5
Interpass Temperature (°F):	300 +/-25	300 +/-25
Heat Input (KJ/in):	45	41

TEST RESULTS:

	Requirements	Actual Results-3/32"	Actual Results-.045"
Tensile Strength (psi):	70-95,000 min.	85,000	87,900
Yield Strength (psi):	58,000 min.	73,200	74,100
Elongation (%):	22 min.	29	33
Charpy V-notch Impact:		24,23,28,22,22	25,20,31,28,23
ft•lb f @ -20°F	20 min. avg.	23 avg.	25 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by:

Ronald B. Smith, Technical Director



CERTIFICATE OF CONFORMANCE

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SELECT-ARC, INC.
 600 Enterprise Dr.
 P. O. Box 259
 Fort Loramie, OH 45845

Supplied to :

Date:
 Customer Order Number :
 Order Number :
 Weight :
 Lot/ Production No. Shipped:

This is to certify that **Select 97** electrode, classification **E70T-1C, T-9C**, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used for testing on **January 23, 2012**. All tests required by specifications **AWS A5.20/ASME SFA-5.20**, for wire diameters .045" through 3/32", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus	Nickel
Requirements:	0.12 max.	1.75 max.	0.90 max.	0.03 max.	0.03 max.	0.50 max.
Deposit Analysis: 3/32" dia.	0.05	1.74	0.29	0.012	0.009	0.30
.045" dia.	0.05	1.46	0.49	0.011	0.008	0.33

RADIOGRAPHIC TESTS

Met requirements

FILLET WELD TESTS

Met requirements

MECHANICAL PROPERTIES

AS WELDED

STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in):	3/32	.045
Amperage:	400	245
Arc Voltage:	30	29
Current Polarity:	DCEP	DCEP
Electrical Extension (in):	1	3/4
Shielding Gas:	CO ₂	CO ₂
No. of Passes/Layers:	11/6	12/6
Interpass Temperature (°F):	300 +/-25	300 +/-25
Heat Input (KJ/in):	50	38

TEST RESULTS:

	Requirements	Actual Results-3/32"	Actual Results-.045"
Tensile Strength (psi):	70-95,000 min.	86,300	80,100
Yield Strength (psi):	58,000 min.	74,900	68,900
Elongation (%):	22 min.	28	27
Charpy V-notch Impact:		32,31,33,40,40	39,46,38,33,30
ft•lb f @ -20°F	20 min. avg.	35 avg.	37 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by:

Ronald B. Smith, Technical Director



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This is to certify that **Select 70TR** electrode, classification **E70T-1C, T-9C**, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used for testing on **January 5, 2012**. All tests required by specifications **AWS A5.20/ASME SFA-5.20**, for wire diameters 1/16" through 3/32", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus
Requirements:	0.12 max.	1.75 max.	0.90 max.	0.03 max.	0.03 max.
Deposit Analysis: 3/32" dia.	0.05	1.35	0.59	0.011	0.008
1/16" dia.	0.05	1.46	0.60	0.009	0.006

RADIOGRAPHIC TESTS

Met requirements

FILLET WELD TESTS

Met requirements

MECHANICAL PROPERTIES

AS WELDED

STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in):	3/32	1/16
Amperage:	395	270
Arc Voltage:	29	30
Current Polarity:	DCEP	DCEP
Electrical Extension (in):	1	3/4
Shielding Gas:	CO ₂	CO ₂
No. of Passes/Layers:	12/6	14/7
Interpass Temperature (°F):	300 +/-25	300 +/-25
Heat Input (KJ/in):	50	40

TEST RESULTS:

	Requirements	Actual Results-3/32"	Actual Results-1/16"
Tensile Strength (psi):	70-95,000 min.	82,900	88,400
Yield Strength (psi):	58,000 min.	69,400	75,600
Elongation (%):	22 min.	29	28
Charpy V-notch Impact:		48,49,36,33,36	16,28,25,23,16
ft•lb f @ -20°F	20 min. avg.	40 avg.	21 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by:

Ronald B. Smith, Technical Director



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 Customer Order Number :
 Order Number :
 Weight :
 Lot/ Production No. Shipped:

This is to certify that **Select 720 HP** electrode, classification **E71T-12MJ** as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used testing on **January 10, 2012**. All tests required by specifications **AWS A5.20/ASME SFA-5.20**, for wire diameter .035" through 1/16", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus	Nickel
Requirements:	0.12 max.	1.60 max.	0.90 max.	0.03 max.	0.03 max.	0.50 max.
Deposit Analysis:	0.07	1.03	0.35	0.009	0.012	0.42

RADIOGRAPHIC TEST

Met requirements

FILLET WELD TEST

Met requirements

MECHANICAL PROPERTIES

AS WELDED

STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in): 1/16
 Amperage: 260
 Arc Voltage: 28
 Current Polarity: DCEP
 Electrical Extension (in): 3/4
 Shielding Gas: Ar-25%CO₂
 No. of Passes/Layers: 14/7
 Interpass Temperature (°F): 300 +/-25
 Heat Input (KJ/in): 33

TEST RESULTS:

	<u>Requirements</u>	<u>Actual Results</u>
Tensile Strength (psi):	70-90,000	86,600
Yield Strength (psi):	58,000 min.	77,300
Elongation (%):	22 min.	29
Charpy V-notch Impact: ft•lb f @ -40°F	20 min. avg.	60,56,50,55,68 57 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by:

Ronald B. Smith Technical Director



CERTIFICATE OF CONFORMANCE

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 SELECT ARC, INC.
 600 Enterprise Dr.
 P. O. Box 259
 Fort Loramie, OH 45845

Supplied to :

Date:
 Customer Order Number :
 Order Number :
 Weight :
 Lot/ Production No. Shipped:

This is to certify that **Select 720 HP** electrode, classification **E71T-12CJ-H4** as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used for testing on **January 17, 2012**. All tests required by specifications **AWS A5.20/ASME SFA-5.20**, for wire diameter .035" through 1/16", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus	Nickel
Requirements:	0.12 max.	1.60 max.	0.90 max.	0.03 max.	0.03 max.	0.50 max.
Deposit Analysis:	0.06	1.25	0.39	0.009	0.009	0.39

RADIOGRAPHIC TEST

Met requirements

FILLET WELD TEST

Met requirements

WELD METAL DIFFUSIBLE HYDROGEN (mL/100g) by Gas Chromatography method per AWS A4.3-93

2.9

MECHANICAL PROPERTIES

AS WELDED

STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in): 1/16
 Amperage: 270
 Arc Voltage: 29
 Current Polarity: DCEP
 Electrical Extension (in): ¾
 Shielding Gas: CO₂
 No. of Passes/Layers: 12/6
 Interpass Temperature (°F): 300 +/-25
 Heat Input (KJ/in): 39

TEST RESULTS:

	<u>Requirements</u>	<u>Actual Results</u>
Tensile Strength (psi):	70-90,000	82,600
Yield Strength (psi):	58,000 min.	69,300
Elongation (%):	22 min.	29
Charpy V-notch Impact: ft•lb f @ -40°F	20 min. avg.	60,56,50,55,48 54 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by: 

Ronald B. Smith Technical Director



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600 Enterprise Dr.
P. O. Box 259
Fort Loramie, OH 45845

Supplied to :

Date:
Customer Order Number :
Order Number :
Weight :
Lot/ Production No. Shipped:

This is to certify that Select 720 electrode, classification E71T-1C, T-1CJ, T-9C, T-9CJ, T12C, T-12CJ, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used testing on February 2, 2012. All tests required by specifications AWS A5.20/ASME SFA-5.20, for wire diameters .035" through 1/16", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

Table with 6 columns: Element (Carbon, Manganese, Silicon, Sulphur, Phosphorus), Requirements, and Deposit Analysis (1/16" dia).

RADIOGRAPHIC TEST

Met requirements

FILLET WELD TEST

Met requirements

MECHANICAL PROPERTIES

AS WELDED [checked]

STRESS RELIEVED (hr @ °F) [unchecked]

WELDING PARAMETERS:

Electrode Diameter (in): 1/16
Amperage: 300
Arc Voltage: 29.5
Current Polarity: DCEP
Electrical Extension (in): 3/4
Shielding Gas: CO2
No. of Passes/Layers: 12/6
Interpass Temperature (°F): 300 +/-25
Heat Input (KJ/in): 44

TEST RESULTS:

Table with 3 columns: Property (Tensile Strength, Yield Strength, Elongation, Charpy V-notch Impact), Requirements, and Actual Results.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Handwritten signature of Ronald B. Smith

Signed by: Ronald B. Smith Technical Director



CERTIFICATE OF CONFORMANCE

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 SELECT ARC, INC.
 600 Enterprise Dr.
 P. O. Box 259
 Fort Loramie, OH 45845

Supplied to :

Date:
 Customer Order Number :
 Order Number :
 Weight :
 Lot/ Production No. Shipped:

This is to certify that **Select 720A** electrode, classification **E71T-9C**, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used testing on **February 28, 2012**. All tests required by specifications **AWS A5.20/ASME SFA-5.20**, for wire diameters .035" through 1/16", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus
Requirements:	0.12 max.	1.60 max.	0.90 max.	0.03 max.	0.03 max.
Deposit Analysis: 1/16" dia.	0.05	1.26	0.37	0.009	0.007

RADIOGRAPHIC TEST

Met requirements

FILLET WELD TEST

Met requirements

MECHANICAL PROPERTIES

AS WELDED

STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in): 1/16
 Amperage: 300
 Arc Voltage: 29.5
 Current Polarity: DCEP
 Electrical Extension (in): 3/4
 Shielding Gas: CO₂
 No. of Passes/Layers: 12/6
 Interpass Temperature (°F): 300 +/-25
 Heat Input (KJ/in): 44

TEST RESULTS:

	<u>Requirements</u>	<u>Actual Results</u>
Tensile Strength (psi):	70-90,000	84,400
Yield Strength (psi):	58,000 min.	74,300
Elongation (%):	22 min.	28
Charpy V-notch Impact: ft•lb f @ -40°F	20 min. avg.	46,52,55,47,57 51 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by: 
 Ronald B. Smith Technical Director



CERTIFICATE OF CONFORMANCE

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SELECT ARC, INC.
600 Enterprise Dr.
P. O. Box 259
Fort Loramie, OH 45845

Supplied to :

Date:
Customer Order Number :
Order Number :
Weight :
Lot/ Production No. Shipped:

This is to certify that Select 720AR electrode, classification E71T-9C, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used testing on February 28, 2012. All tests required by specifications AWS A5.20/ASME SFA-5.20, for wire diameters .035" through 1/16", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

Table with 6 columns: Element (Carbon, Manganese, Silicon, Sulphur, Phosphorus), Requirements, and Deposit Analysis (1/16" dia.).

RADIOGRAPHIC TEST

Met requirements

FILLET WELD TEST

Met requirements

MECHANICAL PROPERTIES

AS WELDED [X]

STRESS RELIEVED (hr @ °F) []

WELDING PARAMETERS:

Electrode Diameter (in): 1/16
Amperage: 300
Arc Voltage: 29.5
Current Polarity: DCEP
Electrical Extension (in): 3/4
Shielding Gas: CO2
No. of Passes/Layers: 12/6
Interpass Temperature (°F): 300 +/-25
Heat Input (KJ/in): 44

TEST RESULTS:

Table with 3 columns: Property (Tensile Strength, Yield Strength, Elongation, Charpy V-notch Impact), Requirements, and Actual Results.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Handwritten signature of Ronald B. Smith

Signed by: Ronald B. Smith Technical Director



CERTIFICATE OF CONFORMANCE

Manufactured in the U.S.A. by :
SELECT ARC, INC.
 600 Enterprise Dr.
 P. O. Box 259
 Fort Loramie, OH 45845

Supplied to :

Date:
 Customer Order Number :
 Order Number :
 Weight :
 Lot/ Production No. Shipped:

This is to certify that **Select 727** electrode, classification **E71T-1M, T-1MJ, T-9M, T-9MJ**, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used testing on **January 20, 2012**. All tests required by specifications **AWS A5.20/ASME SFA-5.20**, for wire diameters .035" through 1/16", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus
Requirements:	0.12 max.	1.75 max.	0.90 max.	0.03 max.	0.03 max.
Deposit Analysis: 1/16" dia.	0.07	1.51	0.50	0.009	0.008

RADIOGRAPHIC TEST

Met requirements

FILLET WELD TEST

Met requirements

WELD METAL DIFFUSIBLE HYDROGEN (mL/100g) by Gas Chromatography method per AWS A4.3-93

MECHANICAL PROPERTIES

AS WELDED

STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in): 1/16
 Amperage: 300
 Arc Voltage: 28
 Current Polarity: DCEP
 Electrical Extension (in): 3/4
 Shielding Gas: Ar-25%CO₂
 No. of Passes/Layers: 12/6
 Interpass Temperature (°F): 300 +/-25
 Heat Input (KJ/in): 44

TEST RESULTS:

	<u>Requirements</u>	<u>Actual Results</u>
Tensile Strength (psi):	70-95,000	91,000
Yield Strength (psi):	58,000 min.	79,000
Elongation (%):	22 min.	28
Charpy V-notch Impact:		36,36,41,43,35
ft•lb f @ -40°F	20 min. avg.	38 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by: 

Ronald B. Smith Technical Director



CERTIFICATE OF CONFORMANCE

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SELECT ARC, INC.
600 Enterprise Dr.
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Fort Loramie, OH 45845

Supplied to :

Date:
Customer Order Number :
Order Number :
Weight :
Lot/ Production No. Shipped:

This is to certify that Select 720 electrode, classification E71T-1C, T-1CJ, T-9C, T-9CJ, T12C, T-12CJ, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used testing on February 2, 2012. All tests required by specifications AWS A5.20/ASME SFA-5.20, for wire diameters .035" through 1/16", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

Table with 6 columns: Element (Carbon, Manganese, Silicon, Sulphur, Phosphorus), Requirements, and Deposit Analysis (1/16" dia).

RADIOGRAPHIC TEST

Met requirements

FILLET WELD TEST

Met requirements

MECHANICAL PROPERTIES

AS WELDED [checked]

STRESS RELIEVED (hr @ °F [unchecked]

WELDING PARAMETERS:

Electrode Diameter (in): 1/16
Amperage: 300
Arc Voltage: 29.5
Current Polarity: DCEP
Electrical Extension (in): 3/4
Shielding Gas: CO2
No. of Passes/Layers: 12/6
Interpass Temperature (°F): 300 +/-25
Heat Input (KJ/in): 44

TEST RESULTS:

Table with 3 columns: Property (Tensile Strength, Yield Strength, Elongation, Charpy V-notch Impact), Requirements, and Actual Results.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Handwritten signature of Ronald B. Smith

Signed by: Ronald B. Smith Technical Director



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SELECT ARC, INC.
 600 Enterprise Dr.
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 Fort Loramie, OH 45845

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 Order Number :
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This is to certify that **Encore** electrode, classification **E71T-1M, T-9M**, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used testing on **February 2, 2012**. All tests required by specifications **AWS A5.20/ASME SFA-5.20**, for wire diameters .045" through 1/16", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus
Requirements:	0.12 max.	1.75 max.	0.90 max.	0.03 max.	0.03 max.
Deposit Analysis: 1/16" dia.	0.06	1.36	0.34	0.012	0.007

RADIOGRAPHIC TEST

Met requirements

FILLET WELD TEST

Met requirements

MECHANICAL PROPERTIES

AS WELDED

STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in): 1/16
 Amperage: 265
 Arc Voltage: 28
 Current Polarity: DCEP
 Electrical Extension (in): 3/4
 Shielding Gas: Ar-25%CO₂
 No. of Passes/Layers: 14/7
 Interpass Temperature (°F): 300 +/-25
 Heat Input (KJ/in): 40

TEST RESULTS:

	<u>Requirements</u>	<u>Actual Results</u>
Tensile Strength (psi):	70-95,000 min.	83,400
Yield Strength (psi):	58,000 min.	72,300
Elongation (%):	22 min.	34
Charpy V-notch Impact: ft•lb f @ -20°F	20 min. avg.	22,35,20,30,23 25 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by: 

Ronald B. Smith Technical Director



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Weight :
Lot/ Production No. Shipped:

This is to certify that Encore electrode, classification E71T-1C, T-9C, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used testing on February 8, 2012. All tests required by specifications AWS A5.20/ASME SFA-5.20, for wire diameters .045" through 1/16", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

Table with 6 columns: Element (Carbon, Manganese, Silicon, Sulphur, Phosphorus), Requirements, and Deposit Analysis (1/16" dia).

RADIOGRAPHIC TEST

Met requirements

FILLET WELD TEST

Met requirements

MECHANICAL PROPERTIES

AS WELDED [X]

STRESS RELIEVED (hr @ °F) []

WELDING PARAMETERS:

Electrode Diameter (in): 1/16
Amperage: 255
Arc Voltage: 28.5
Current Polarity: DCEP
Electrical Extension (in): 3/4
Shielding Gas: CO2
No. of Passes/Layers: 14/7
Interpass Temperature (°F): 300 +/-25
Heat Input (KJ/in): 38

TEST RESULTS:

Table with 3 columns: Property (Tensile Strength, Yield Strength, Elongation, Charpy V-notch Impact), Requirements, and Actual Results.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

[Handwritten signature]

Signed by:

Ronald B. Smith Technical Director



CERTIFICATE OF CONFORMANCE

Manufactured in the U.S.A. by :
SELECT ARC, INC.
 600 Enterprise Dr.
 P. O. Box 259
 Fort Loramie, OH 45845

Supplied to :

Date:
 Customer Order Number :
 Order Number :
 Weight :
 Lot/ Production No. Shipped:

This is to certify that **Select 810-Ni1** electrode, classification **E81T1-Ni1MJ**, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used for testing on **February 7, 2012**. All tests required by specifications **AWS A5.29/ASME SFA-5.29**, for wire diameters .045" through 1/16", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus	Nickel	Chromium	Molybdenum	Vanadium
Requirements:	0.12 max.	1.50 max.	0.80 max.	0.03 max.	0.03 max.	0.80-1.10	0.15 max.	0.35 max.	0.05 max.
Deposit Analysis: 1/16" dia.	0.07	1.37	0.48	0.009	0.011	1.00	0.08	<0.01	0.02

RADIOGRAPHIC TEST

Met requirements

FILLET WELD TEST

Met requirements

MECHANICAL PROPERTIES

AS WELDED

STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in): 1/16
 Amperage: 260
 Arc Voltage: 28
 Current Polarity: DCEP
 Electrical Extension (in): 3/4
 Shielding Gas: Ar-25%CO₂
 No. of Passes/Layers: 15/7
 Preheat /Interpass Temp (°F): 300 +/-25
 Heat Input (KJ/in): 34

TEST RESULTS:

	<u>Requirements</u>	<u>Actual Results</u>
Tensile Strength (psi):	80-100,000	92,100
Yield Strength (psi):	68,000 min.	80,600
Elongation (%):	19 min.	26
Charpy V-notch Impact: ft•lb f @ -40°F	20 min. avg.	24,20,26,20,18 21 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by: _____
Ronald B. Smith, Technical Director



CERTIFICATE OF CONFORMANCE

Manufactured in the U.S.A. by :
SELECT ARC, INC.
 600 Enterprise Dr.
 P. O. Box 259
 Fort Loramie, OH 45845

Supplied to :

Date:
 Customer Order Number :
 Order Number :
 Weight :
 Lot/ Production No. Shipped:

This is to certify that **Select 810-Ni1** electrode, classification **E81T1-Ni1CJ**, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used for testing on **February 7, 2012**. All tests required by specifications **AWS A5.29/ASME SFA-5.29**, for wire diameters .045" through 1/16", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus	Nickel	Chromium	Molybdenum	Vanadium
Requirements:	0.12 max.	1.50 max.	0.80 max.	0.03 max.	0.03 max.	0.80-1.10	0.15 max.	0.35 max.	0.05 max.
Deposit Analysis: 1/16" dia.	0.05	1.19	0.38	0.008	0.011	0.93	0.06	<0.01	0.02

RADIOGRAPHIC TEST

Met requirements

FILLET WELD TEST

Met requirements

MECHANICAL PROPERTIES

AS WELDED

STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in): 1/16
 Amperage: 255
 Arc Voltage: 30
 Current Polarity: DCEP
 Electrical Extension (in): 3/4
 Shielding Gas: CO₂
 No. of Passes/Layers: 14/7
 Preheat /Interpass Temp (°F): 300 +/-25
 Heat Input (KJ/in): 32

TEST RESULTS:

	<u>Requirements</u>	<u>Actual Results</u>
Tensile Strength (psi):	80-100,000	87,600
Yield Strength (psi):	68,000 min.	76,300
Elongation (%):	19 min.	30
Charpy V-notch Impact: ft•lb f @ -40°F	20 min. avg.	29,38,24,30,38 32 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by: _____
Ronald B. Smith, Technical Director



CERTIFICATE OF CONFORMANCE

Manufactured in the U.S.A. by :
SELECT ARC, INC.
 600 Enterprise Dr.
 P. O. Box 259
 Fort Loramie, OH 45845

Supplied to :

Date:
 Customer Order Number :
 Order Number :
 Weight :
 Lot/ Production No. Shipped:

This is to certify that **Select 810-Ni2** electrode, classification **E81T1-Ni2M**, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used for testing on **January 6, 2012**. All tests required by specifications **AWS A5.29/ASME SFA-5.29**, for wire diameters .045" through 1/16", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus	Nickel
Requirements:	0.12 max.	1.50 max.	0.80 max.	0.03 max.	0.03 max.	1.75-2.75
Deposit Analysis: 1/16" dia.	0.05	1.17	0.48	0.009	0.008	2.49

RADIOGRAPHIC TEST

Met requirements

FILLET WELD TEST

Met requirements

MECHANICAL PROPERTIES

AS WELDED

STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in): 1/16
 Amperage: 280
 Arc Voltage: 27
 Current Polarity: DCEP
 Electrical Extension (in): 3/4
 Shielding Gas: Ar-25%CO₂
 No. of Passes/Layers: 16/8
 Preheat /Interpass Temp (°F): 300 +/-25
 Heat Input (KJ/in): 34

TEST RESULTS:

	<u>Requirements</u>	<u>Actual Results</u>
Tensile Strength (psi):	80-100,000	95,500
Yield Strength (psi):	68,000 min.	84,400
Elongation (%):	19 min.	27
Charpy V-notch Impact:		34,33,40,39,48
ft•lb f @ -40°F	20 min. avg.	38 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by: 
 Ronald B. Smith, Technical Director



CERTIFICATE OF CONFORMANCE

Manufactured in the U.S.A. by :
SELECT ARC, INC.
 600 Enterprise Dr.
 P. O. Box 259
 Fort Loramie, OH 45845

Supplied to :

Date:
 Customer Order Number :
 Order Number :
 Weight :
 Lot/ Production No. Shipped:

This is to certify that **Select 810-Ni2** electrode, classification **E81T1-Ni2C**, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used for testing on **January 9, 2012**. All tests required by specifications **AWS A5.29/ASME SFA-5.29**, for wire diameters .045" through 1/16", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus	Nickel
Requirements:	0.12 max.	1.50 max.	0.80 max.	0.03 max.	0.03 max.	1.75-2.75
Deposit Analysis: 1/16" dia.	0.05	1.02	0.38	0.009	0.008	2.48

RADIOGRAPHIC TEST

Met requirements

FILLET WELD TEST

Met requirements

MECHANICAL PROPERTIES

AS WELDED

STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in): 1/16
 Amperage: 285
 Arc Voltage: 28
 Current Polarity: DCEP
 Electrical Extension (in): 3/4
 Shielding Gas: CO₂
 No. of Passes/Layers: 17/8
 Preheat /Interpass Temp (°F): 300 +/-25
 Heat Input (KJ/in): 33

TEST RESULTS:

	<u>Requirements</u>	<u>Actual Results</u>
Tensile Strength (psi):	80-100,000	88,100
Yield Strength (psi):	68,000 min.	76,900
Elongation (%):	19 min.	30
Charpy V-notch Impact: ft•lb f @ -40°F	20 min. avg.	45,45,36,47,40 43 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by: _____
Ronald B. Smith, Technical Director



CERTIFICATE OF CONFORMANCE

Manufactured in the U.S.A. by :
SELECT ARC, INC.
 600 Enterprise Dr.
 P. O. Box 259
 Fort Loramie, OH 45845

Supplied to :

Date:
 Customer Order Number :
 Order Number :
 Weight :
 Lot/ Production No. Shipped:

This is to certify that **Select 810W** electrode, classification **E81T1-W2M**, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used for testing on **February 8, 2012**. All tests required by specifications **AWS A5.29/ASME SFA-5.29**, for wire diameters .045" through 1/16", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus	Nickel	Chromium	Copper
Requirements:	0.12 max.	0.50-1.30	0.35-0.80	0.03 max.	0.03 max.	0.40-0.80	0.45-0.70	0.30-0.75
Deposit Analysis: 1/16" dia.	0.06	1.05	0.54	0.009	0.009	0.59	0.54	0.41

RADIOGRAPHIC TEST

Met requirements

FILLET WELD TEST

Met requirements

MECHANICAL PROPERTIES

AS WELDED

STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in): 1/16
 Amperage: 270
 Arc Voltage: 27
 Current Polarity: DCEP
 Electrical Extension (in): 3/4
 Shielding Gas: 75Ar-25CO₂
 No. of Passes/Layers: 14/7
 Preheat/Interpass Temp (°F): 300 +/-25
 Heat Input (KJ/in): 38

TEST RESULTS:

	<u>Requirements</u>	<u>Actual Results</u>
Tensile Strength (psi):	80-100,000	96,700
Yield Strength (psi):	68,000 min.	85,700
Elongation (%):	19 min.	24
Charpy V-notch Impact:		23,20,22,17,20
ft•lb f @ -20°F	20 min. avg.	21 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by:

Ronald B. Smith, Technical Director



CERTIFICATE OF CONFORMANCE

Manufactured in the U.S.A. by :
SELECT ARC, INC.
 600 Enterprise Dr.
 P. O. Box 259
 Fort Loramie, OH 45845

Supplied to :

Date:
 Customer Order Number :
 Order Number :
 Weight :
 Lot/ Production No. Shipped:

This is to certify that **Select 810W** electrode, classification **E81T1-W2C**, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used for testing on **February 17, 2012**. All tests required by specifications **AWS A5.29/ASME SFA-5.29**, for wire diameters .045” through 1/16”, were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus	Nickel	Chromium	Copper
Requirements:	0.12 max.	0.50-1.30	0.35-0.80	0.03 max.	0.03 max.	0.40-0.80	0.45-0.70	0.30-0.75
Deposit Analysis: 1/16” dia.	0.05	0.80	0.36	0.010	0.009	0.59	0.50	0.40

RADIOGRAPHIC TEST

Met requirements

FILLET WELD TEST

Met requirements

MECHANICAL PROPERTIES

AS WELDED

STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in): 1/16
 Amperage: 270
 Arc Voltage: 28
 Current Polarity: DCEP
 Electrical Extension (in): 3/4
 Shielding Gas: CO₂
 No. of Passes/Layers: 15/7
 Preheat/Interpass Temp (°F): 300 +/-25
 Heat Input (KJ/in): 41

TEST RESULTS:

	<u>Requirements</u>	<u>Actual Results</u>
Tensile Strength (psi):	80-100,000	83,200
Yield Strength (psi):	68,000 min.	71,500
Elongation (%):	19 min.	29
Charpy V-notch Impact: ft•lb f @ -20°F	20 min. avg.	31,29,40,44,40 37 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by:

Ronald B. Smith, Technical Director



CERTIFICATE OF CONFORMANCE

Manufactured in the U.S.A. by :
SELECT ARC, INC.
 600 Enterprise Dr.
 P. O. Box 259
 Fort Loramie, OH 45845

Supplied to :

Date:
 Customer Order Number :
 Order Number :
 Weight :
 Lot/ Production No. Shipped:

This is to certify that **Select 820-Ni1** electrode, classification **E81T1-Ni1MJ**, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used for testing on **January 9, 2012**. All tests required by specifications **AWS A5.29/ASME SFA-5.29**, for wire diameters .045" through 1/16", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus	Nickel	Chromium	Molybdenum	Vanadium
Requirements:	0.12 max.	1.50 max.	0.80 max.	0.03 max.	0.03 max.	0.80-1.10	0.15 max.	0.35 max.	0.05 max.
Deposit Analysis: 1/16" dia.	0.04	1.30	0.45	0.008	0.009	0.97	0.04	0.01	0.02

RADIOGRAPHIC TEST

Met requirements

FILLET WELD TEST

Met requirements

MECHANICAL PROPERTIES

AS WELDED

STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in): 1/16
 Amperage: 300
 Arc Voltage: 28
 Current Polarity: DCEP
 Electrical Extension (in): 3/4
 Shielding Gas: Ar-25%CO₂
 No. of Passes/Layers: 16/8
 Preheat /Interpass Temp (°F): 300 +/-25
 Heat Input (KJ/in): 30

TEST RESULTS:

	<u>Requirements</u>	<u>Actual Results</u>
Tensile Strength (psi):	80-100,000	87,700
Yield Strength (psi):	68,000 min.	79,700
Elongation (%):	19 min.	31
Charpy V-notch Impact: ft•lb f @ -20°F	20 min. avg.	124,135,124,124,122 124 avg.
Charpy V-notch Impact: ft•lb f @ -40°F	20 min. avg.	110,114,116,104,112 112 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by: _____
Ronald B. Smith, Technical Director



CERTIFICATE OF CONFORMANCE

Manufactured in the U.S.A. by :
SELECT ARC, INC.
 600 Enterprise Dr.
 P. O. Box 259
 Fort Loramie, OH 45845

Supplied to :

Date:
 Customer Order Number:
 Order Number :
 Weight :
 Lot/ Production No. Shipped:

This is to certify that **Select 820-Ni1** electrode, classification **E81T1-Ni1CJ**, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used for testing on **January 9, 2012**. All tests required by specifications **AWS A5.29/ASME SFA-5.29**, for wire diameters .045" through 1/16", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus	Nickel	Chromium	Molybdenum	Vanadium
Requirements:	0.12 max.	1.50 max.	0.80 max.	0.03 max.	0.03 max.	0.80-1.10	0.15 max.	0.35 max.	0.05 max.
Deposit Analysis: 1/16" dia.	0.04	1.11	0.35	0.010	0.008	0.95	0.04	0.01	0.02

RADIOGRAPHIC TEST

Met requirements

FILLET WELD TEST

Met requirements

MECHANICAL PROPERTIES

AS WELDED

STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in): 1/16
 Amperage: 255
 Arc Voltage: 28
 Current Polarity: DCEP
 Electrical Extension (in): 3/4
 Shielding Gas: CO₂
 No. of Passes/Layers: 16/8
 Preheat /Interpass Temp (°F): 300 +/-25
 Heat Input (KJ/in): 35

TEST RESULTS:

	<u>Requirements</u>	<u>Actual Results</u>
Tensile Strength (psi):	80-100,000	83,000
Yield Strength (psi):	68,000 min.	75,000
Elongation (%):	19 min.	29
Charpy V-notch Impact: ft•lb f @ -20°F	20 min. avg.	62,58,77,92,69 69 avg.
Charpy V-notch Impact: ft•lb f @ -40°F	20 min. avg.	68,66,66,60,77 67 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by: _____
Ronald B. Smith, Technical Director



CERTIFICATE OF CONFORMANCE

Manufactured in the U.S.A. by :
SELECT ARC, INC.
 600 Enterprise Dr.
 P. O. Box 259
 Fort Loramie, OH 45845

Supplied to :

Date:
 Customer Order Number :
 Order Number :
 Weight :
 Lot/ Production No. Shipped:

This is to certify that **Select 920-Ni1** electrode, classification **E91T1-GC**, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used for testing on **February 9, 2012**. All tests required by specifications **AWS A5.29/ASME SFA-5.29**, for wire diameters .045" through 1/16", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus	Nickel
Requirements:	-	0.50 min.	1.00 max.	0.030	0.030	0.50 min.
Deposit Analysis: 1/16" dia.	0.04	1.53	0.58	0.007	0.006	0.85

RADIOGRAPHIC TEST

Met requirements

FILLET WELD TEST

Met requirements

WELD METAL DIFFUSIBLE HYDROGEN (mL/100g) by Gas Chromatography method per AWS A4.3-93

MECHANICAL PROPERTIES

AS WELDED

STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in): 1/16
 Amperage: 310
 Arc Voltage: 28
 Current Polarity: DCEP
 Electrical Extension (in): 3/4
 Shielding Gas: CO₂
 No. of Passes/Layers: 17/8
 Preheat /Interpass Temp (°F): 300 +/-25
 Heat Input (KJ/in): 33

TEST RESULTS:

	<u>Requirements</u>	<u>Actual Results</u>
Tensile Strength (psi):	90,000	93,800
Yield Strength (psi):	Not Required	83,700
Elongation (%):	Not Required	27
Charpy V-notch Impact: ft•lb f @ -40°F	Not Required	48,57,38,37,75 48 avg.
Charpy V-notch Impact: ft•lb f @ -50°F	Not Required	40,30,55,43,35 39 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by: _____
Ronald B. Smith, Technical Director



CERTIFICATE OF CONFORMANCE

Manufactured in the U.S.A. by :
SELECT ARC, INC.
 600 Enterprise Dr.
 P. O. Box 259
 Fort Loramie, OH 45845

Supplied to :

Date:
 Customer Order Number :
 Order Number :
 Weight :
 Lot/ Production No. Shipped:

This is to certify that **Select 111-K3C** electrode, classification **E111T1-K3CJ**, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used for testing on **July 30, 2012**. All tests required by specifications **AWS A5.29/ASME SFA-5.29**, for wire diameters .045" through 1/16", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus	Nickel	Chromium	Molybdenum	Vanadium
Requirements:	0.15 max	0.75-2.25	0.80 max.	0.030 max	0.030 max	1.25-2.60	0.15 max	0.25-0.65	0.05 max
Deposit Analysis:	0.06	1.66	0.33	0.007	0.010	1.78	0.10	0.35	0.01

RADIOGRAPHIC TEST

Met requirements

FILLET WELD TEST

Met requirements

MECHANICAL PROPERTIES

AS WELDED

STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in): 1/16
 Amperage: 2700
 Arc Voltage: 28
 Current Polarity: DCEP
 Electrical Extension (in): 3/4
 Shielding Gas: CO₂
 No. of Passes/Layers: 16/8
 Preheat /Interpass Temp (°F): 300 +/-25
 Heat Input (KJ/in): 37

TEST RESULTS:

	<u>Requirements</u>	<u>Actual Results</u>
Tensile Strength (psi):	110-130,000	93,800
Yield Strength (psi):	98,000 min.	83,700
Elongation (%):	15 min.	27
Charpy V-notch Impact:		48,53,50,49,49
ft•lb f @ -20°F	20	49 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by: 

Ronald B. Smith, Technical Director



CERTIFICATE OF CONFORMANCE

Manufactured in the U.S.A. by :
 SELECT ARC, INC.
 600 Enterprise Dr.
 P. O. Box 259
 Fort Loramie, OH 45845

Supplied to :

Date:
 Customer Order Number :
 Order Number
 Weight :
 Lot/ Production No. Shipped:

This is to certify that **Select 70C-3** electrode, classification **E70C-3M**, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used for testing on **January 12, 2012**. All tests required by specifications **AWS A5.18/ASME SFA-5.18**, for wire diameters .035” through 3/32””, were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus	Nickel	Chromium	Molybdenum	Vanadium	Copper
Requirements:	0.12 max.	1.75 max.	0.90 max.	0.03 max.	0.03 max.	0.50 max.	0.20 max.	0.30 max.	0.08 max.	0.50 max.
Deposit Analysis: .045” diam.	0.04	1.61	0.57	0.011	0.006	0.03	0.05	0.01	<0.01	0.07

RADIOGRAPHIC TEST

Met requirements

MECHANICAL PROPERTIES

AS WELDED STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in): .045
 Amperage: 240
 Arc Voltage: 29
 Current Polarity: DCEP
 Electrical Extension (in): 3/4
 Shielding Gas: 75Ar/25CO₂
 No. of Passes/Layers: 12/6
 Interpass Temperature (°F): 300 +/-25
 Heat Input (KJ/in): 33

TEST RESULTS:

	<u>Requirements</u>	<u>Actual Results</u>
Tensile Strength (psi):	70,000 min.	77,700
Yield Strength (psi):	58,000 min.	64,800
Elongation (%):	22 min.	32
Charpy V-notch Impact: ft•lb f @ 0°F	20 min. avg.	80,39,72,61,70 68 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by: _____
 Ronald B. Smith, Technical Director



CERTIFICATE OF CONFORMANCE

Manufactured in the U.S.A. by :
 SELECT ARC, INC.
 600 Enterprise Dr.
 P. O. Box 259
 Fort Loramie, OH 45845

Supplied to :

Date:
 Customer Order Number :
 Order Number
 Weight :
 Lot/ Production No. Shipped:

This is to certify that **Select 70C-6** electrode, classification **E70C-6M**, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used for testing on **February 2, 2012**. All tests required by specifications **AWS A5.18/ASME SFA-5.18**, for wire diameters .035" through 3/32", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus	Nickel	Chromium	Molybdenum	Vanadium	Copper
Requirements:	0.12 max.	1.75 max.	0.90 max.	0.03 max.	0.03 max.	0.50 max.	0.20 max.	0.30 max.	0.08 max.	0.50 max.
Deposit Analysis: .045" diam.	0.04	1.57	0.81	0.008	0.006	0.02	0.03	<0.01	<0.01	0.04

RADIOGRAPHIC TEST

Met requirements

MECHANICAL PROPERTIES

AS WELDED STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in): .045
 Amperage: 250
 Arc Voltage: 29
 Current Polarity: DCEP
 Electrical Extension (in): 3/4
 Shielding Gas: 75Ar/25CO₂
 No. of Passes/Layers: 13/6
 Interpass Temperature (°F): 300 +/-25
 Heat Input (KJ/in): 35

TEST RESULTS:

	<u>Requirements</u>	<u>Actual Results</u>
Tensile Strength (psi):	70,000 min.	79,400
Yield Strength (psi):	58,000 min.	65,600
Elongation (%):	22 min.	32
Charpy V-notch Impact: ft•lb f @ -20°F	20 min. avg.	23,18,27,18,23 21 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by: _____
 Ronald B. Smith, Technical Director



CERTIFICATE OF CONFORMANCE

Manufactured in the U.S.A. by :
 SELECT ARC, INC.
 600 Enterprise Dr.
 P. O. Box 259
 Fort Loramie, OH 45845

Supplied to :

Date:
 Customer Order Number :
 Order Number
 Weight :
 Lot/ Production No. Shipped:

This is to certify that **Select 70C-6** electrode, classification **E70C-6M**, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used for testing on **January 24, 2012**. All tests required by specifications **AWS A5.18/ASME SFA-5.18**, for wire diameters .035" through 3/32"', were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus	Nickel	Chromium	Molybdenum	Vanadium	Copper
Requirements:	0.12 max.	1.75 max.	0.90 max.	0.03 max.	0.03 max.	0.50 max.	0.20 max.	0.30 max.	0.08 max.	0.50 max.
Deposit Analysis: .045" diam.	0.04	1.59	0.86	0.007	0.006	0.02	0.03	<0.01	<0.01	0.04

RADIOGRAPHIC TEST

Met requirements

MECHANICAL PROPERTIES

AS WELDED STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in): .045
 Amperage: 275
 Arc Voltage: 29.0
 Current Polarity: DCEP
 Electrical Extension (in): 3/4
 Shielding Gas: 90Ar/10CO₂
 No. of Passes/Layers: 12/6
 Interpass Temperature (°F): 300 +/-25
 Heat Input (KJ/in): 37

TEST RESULTS:

	<u>Requirements</u>	<u>Actual Results</u>
Tensile Strength (psi):	70,000 min.	80,000
Yield Strength (psi):	58,000 min.	66,400
Elongation (%):	22 min.	32
Charpy V-notch Impact: ft•lb f @ -20°F	20 min. avg.	34,40,16,25,32 30 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by: _____
 Ronald B. Smith, Technical Director



CERTIFICATE OF CONFORMANCE

Manufactured in the U.S.A. by :
 SELECT ARC, INC.
 600 Enterprise Dr.
 P. O. Box 259
 Fort Loramie, OH 45845

Supplied to :

Date:
 Customer Order Number :
 Order Number
 Weight :
 Lot/ Production No. Shipped:

This is to certify that **Select 70C-6LS** electrode, classification **E70C-6M**, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used for testing on **February 9, 2012**. All tests required by specifications **AWS A5.18/ASME SFA-5.18**, for wire diameters .035" through 3/32", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus	Nickel	Chromium	Molybdenum	Vanadium	Copper
Requirements:	0.12 max.	1.75 max.	0.90 max.	0.03 max.	0.03 max.	0.50 max.	0.20 max.	0.30 max.	0.08 max.	0.50 max.
Deposit Analysis: .045" diam.	0.04	1.66	0.68	0.010	0.006	0.39	0.05	0.01	<0.01	0.06

RADIOGRAPHIC TEST

Met requirements

MECHANICAL PROPERTIES

AS WELDED STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in): .045
 Amperage: 270
 Arc Voltage: 29.5
 Current Polarity: DCEP
 Electrical Extension (in): 3/4
 Shielding Gas: 75Ar/25CO₂
 No. of Passes/Layers: 12/6
 Interpass Temperature (°F): 300 +/-25
 Heat Input (KJ/in): 32

TEST RESULTS:

	<u>Requirements</u>	<u>Actual Results</u>
Tensile Strength (psi):	70,000 min.	83,400
Yield Strength (psi):	58,000 min.	70,400
Elongation (%):	22 min.	28
Charpy V-notch Impact: ft•lb f @ -20°F	20 min. avg.	20,40,19,28,39 29 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by: _____
 Ronald B. Smith, Technical Director



CERTIFICATE OF CONFORMANCE

Manufactured in the U.S.A. by :
 SELECT ARC, INC.
 600 Enterprise Dr.
 P. O. Box 259
 Fort Loramie, OH 45845

Supplied to :

Date:
 Customer Order Number :
 Order Number
 Weight :
 Lot/ Production No. Shipped:

This is to certify that **Select 70C-6LS** electrode, classification **E70C-6M-H4**, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used for testing on **February 9, 2012**. All tests required by specifications **AWS A5.18/ASME SFA-5.18**, for wire diameters .035" through 3/32", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus	Nickel	Chromium	Molybdenum	Vanadium	Copper
Requirements:	0.12 max.	1.75 max.	0.90 max.	0.03 max.	0.03 max.	0.50 max.	0.20 max.	0.30 max.	0.08 max.	0.50 max.
Deposit Analysis: .045" diam.	0.04	1.61	0.67	0.011	0.005	0.42	0.06	0.01	<0.01	0.07

RADIOGRAPHIC TEST

Met requirements

WELD METAL DIFFUSIBLE HYDROGEN (mL/100g) by Gas Chromatography method per AWS A4.3-93

Requirement: 4.0 avg. Actual: 2.2, 1.8, 1.5, 1.8 (1.8 avg)

MECHANICAL PROPERTIES

AS WELDED STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in): .045
 Amperage: 260
 Arc Voltage: 28
 Current Polarity: DCEP
 Electrical Extension (in): 3/4
 Shielding Gas: 90Ar/10CO₂
 No. of Passes/Layers: 14/7
 Interpass Temperature (°F): 300 +/-25
 Heat Input (KJ/in): 34

TEST RESULTS:

	Requirements	Actual Results
Tensile Strength (psi):	70,000 min.	80,500
Yield Strength (psi):	58,000 min.	67,000
Elongation (%):	22 min.	30
Charpy V-notch Impact: ft•lb f @ -20°F	20 min. avg.	54,36,40,43,25 40 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by: _____
Ronald B. Smith, Technical Director



CERTIFICATE OF CONFORMANCE

Manufactured in the U.S.A. by :
SELECT-ARC, INC.
 600 Enterprise Dr.
 P. O. Box 259
 Fort Loramie, OH 45845

Supplied to:

Date:
 Customer Order Number :
 Order Number :
 Weight :
 Lot/ Production No. Shipped:

This is to certify that **Select 70C-T** electrode, classification **E70C-6M**, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used for testing on **January 20, 2012**. All tests required by specifications **AWS A5.18/ASME SFA-5.18**, for wire diameters .035" through 1/16", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus	Nickel	Chromium	Molybdenum	Vanadium	Copper
Requirements:	0.12 max.	1.75 max.	0.90 max.	0.03 max.	0.03 max.	0.50 max.	0.20 max.	0.30 max.	0.08 max.	0.50 max.
Deposit Analysis:	0.04	1.62	0.74	0.009	0.007	0.39	0.04	<0.01	<0.01	0.05

RADIOGRAPHIC TEST

Met requirements

MECHANICAL PROPERTIES

AS WELDED STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in): .045
 Amperage: 250
 Arc Voltage: 29
 Current Polarity: DCEP
 Electrical Extension (in): 3/4
 Shielding Gas: 75Ar/25CO₂
 No. of Passes/Layers: 15/7
 Interpass Temperature (°F): 300 +/-25
 Heat Input (KJ/in): 33

TEST RESULTS:

	<u>Requirements</u>	<u>Actual Results</u>
Tensile Strength (psi):	70,000 min.	80,700
Yield Strength (psi):	58,000 min.	68,200
Elongation (%):	22 min.	32
Charpy V-notch Impact:		75,75,60,77,74
ft•lb f @ -20°F	20 min. avg.	75 avg.
ft•lb f @ -40°F	Not required	48,52,34,60,58
		53 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by: 
Ronald B. Smith, Technical Director



CERTIFICATE OF CONFORMANCE

SELECT-ARC, INC.
 600 Enterprise Dr.
 P. O. Box 259
 Fort Loramie, OH 45845

Supplied to :

Date:
 Customer Order Number :
 Order Number :
 Weight :
 Lot/ Production No. Shipped:

This is to certify that **Select ER70S-3** electrode, classification **ER70S-3**, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used for testing on **April 11, 2012**. All tests required by specifications **AWS A5.18/ASME SFA-5.18**, for wire diameters .035" through 1/16", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus	Nickel	Chromium	Molybdenum	Vanadium	Copper
Requirements:	0.06-0.15	0.90-1.40	0.45-0.75	0.035 max.	0.025 max.	0.15 max.	0.15 max.	0.15 max.	0.03 max.	0.50 max.
Electrode Analysis:	0.07	1.16	0.56	0.010	0.007	<0.01	0.01	0.01	0.002	<0.16

RADIOGRAPHIC TEST

Met requirements

MECHANICAL PROPERTIES

AS WELDED STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in): .045
 Amperage: 240
 Arc Voltage: 30
 Current Polarity: DCEP
 Shielding Gas: CO₂
 No. of Passes/Layers: 12/6
 Interpass Temperature (°F): 300 +/-25
 Heat Input (KJ/in): 34

TEST RESULTS:

	<u>Requirements</u>	<u>Actual Results</u>
Tensile Strength (psi):	70,000 min.	72,400
Yield Strength (psi):	58,000 min.	59,400
Elongation (%):	22 min.	31
Charpy V-notch Impact: ft•lb f @ 0°F	20 min. avg.	111,112,132,136,138 127 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by: _____
 Ronald B. Smith, Technical Director



CERTIFICATE OF CONFORMANCE

SELECT ARC, INC.
 600 Enterprise Dr.
 P. O. Box 259
 Fort Loramie, OH 45845

Supplied to :

Date:
 Customer Order Number :
 Order Number :
 Weight :
 Lot/ Production No. Shipped:

This is to certify that **Select ER70S-6** electrode, classification **ER70S-6**, as supplied on the above order number, is of the same classification, manufacturing process and material requirements as the electrode used for testing on **January 12, 2012**. All tests required by specifications **AWS A5.18/ASME SFA-5.18**, for wire diameters .035" through 1/16", were performed in conformance with these specifications and the results met all requirements. The test results were as follows:

CHEMICAL ANALYSIS (%)

	Carbon	Manganese	Silicon	Sulphur	Phosphorus	Nickel	Chromium	Molybdenum	Vanadium	Copper
Requirements:	0.06-0.15	1.40-1.85	0.80-1.15	0.035 max.	0.025 max.	0.15 max.	0.15 max.	0.15 max.	0.03 max.	0.50 max.
Electrode Analysis:	0.09	1.48	0.87	0.010	0.009	0.01	0.01	0.01	<0.01	<0.16

RADIOGRAPHIC TEST

Met requirements

MECHANICAL PROPERTIES

AS WELDED STRESS RELIEVED (hr @ °F)

WELDING PARAMETERS:

Electrode Diameter (in): .045
 Amperage: 245
 Arc Voltage: 30
 Current Polarity: DCEP
 Shielding Gas: CO₂
 No. of Passes/Layers: 15/7
 Interpass Temperature (°F): 300 +/-25
 Heat Input (KJ/in): 32

TEST RESULTS:

	<u>Requirements</u>	<u>Actual Results</u>
Tensile Strength (psi):	70,000 min.	81,100
Yield Strength (psi):	58,000 min.	77,300
Elongation (%):	22 min.	32
Charpy V-notch Impact: ft•lb f @ -20°F	20 min. avg.	38,57,53,58,68 56 avg.

The undersigned certifies that the product supplied will meet the requirements of the applicable AWS Filler Metal Specification when tested in accordance with that specification, and that no significant change has been made in the formulations and manufacturing procedures described in the qualification approval.

Signed by: _____
 Ronald B. Smith, Technical Director