

ILLINOIS POWER COMPANY

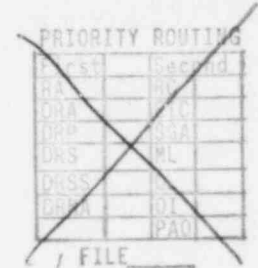


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CLINTON POWER STATION, P.O. BOX 678, CLINTON, ILLINOIS 61727

U-10270

April 24, 1985



Mr. Paul Cortland  
U. S. Nuclear Regulatory Commission  
359 E/W-W  
Washington, DC 20555

Subject: 10CFR50.55(e) Investigation of ASTM A36 Plate Material

Dear Mr. Cortland:

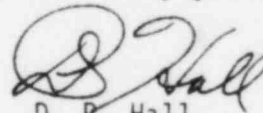
In response to your request of Mr. J. M. Gruber of the Illinois Power Company Quality Assurance Department, enclosed please find documentation pertinent to the 10CFR50.55(e) investigation (84-18) concerning A36 plate material. The information is summarized below.

Attachment 1 - The results of the tests performed by St. Louis Testing Laboratories, Inc. on the Interstate supplied plate materials available from our construction stock. The test reports include the material manufacturer and the tab index number for correlation to the Certified Material Test Reports (CMTRs) provided to you on October 25, 1984. Please note that the heats of material listed in Appendix A of Attachment 1 were retested by St. Louis Testing Laboratories, Inc. The results of the retests are included.

Attachment 2 - The heats of material furnished to Illinois Power Company as full sheets (i.e. 4' X 8' or 5' X 9') not as smaller sheared plates.

We trust that this will provide the data necessary for your investigation. If you should require further information, please contact Illinois Power.

Sincerely yours,

  
D. P. Hall  
Vice President

JG:lsc  
attach.

cc: NRC Resident Office  
Regional Administrator, Region III, USNRC  
Director, Office of I & E, USNRC  
Washington, DC 20555  
Illinois Dept. of Nuclear Safety

8505030091 850424  
PDR ADOCK 05000461  
S PDR

APR 26 1985

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Attachment 1

Heats of Materials Tested

**Saint Louis  
Testing  
Laboratories, Inc.**



2810 Clark Avenue  
St. Louis, Missouri 63103  
314/531-8080

December 28, 1984  
Report No. 84-7726  
Lab No. 84C3230  
84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/8" X 10 X 10, RIR #S11926, Heat #401K7921, 1 & 2

*BETHLEHEM STEEL TAB No. 1*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#1	1.521	.382	.5810	1.090	.180	.1962	66.2	25740	44302	40250	69277	.85	42.5	D
#2	1.516	.383	.5806	1.157	.231	.2672	53.9	24840	42783	39300	67688	.78	39.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#1	.21	.02	.011	1.01	.011	.02
#2	.19	.02	.012	.96	.011	.02

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmmb

**Saint Louis  
Testing  
Laboratories, Inc.**



2810 Clark Avenue  
St. Louis, Missouri 63103  
314/531-8080

December 28, 1984  
Report No. 84-7726  
Lab No. 84C3230  
84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1/4" X 10 X 10. RIR #S11926, Heat #402K5811, 15 & 16 *BETHLEHEM STEEL TAB No. 1*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#15	1.497	.244	.3652	1.124	.148	.1663	54.4	17700	48466	26575	72768	.73	36.5	D
#16	1.504	.247	.3714	1.131	.137	.1549	58.2	18360	49434	27425	73842	.77	38.5	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#15	.20	.03	.017	1.01	.015	.03
#16	.20	.03	.017	1.02	.014	.03

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson



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BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 5/8" X 12 X 12, RIR #S-11926, Heat #422C5351, 11 & 12 *BETHLEHEM STEEL TAB No. 1*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#11	1.514	.624	.9447	1.051	.348	.3657	61.2	40500	42870	67800	71768	.92	46.0	D
#12	1.515	.617	.9347	1.066	.350	.3731	60.0	45780	48978	68100	72857	.90	45.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#11	.21	.03	.017	.99	.017	.07
#12	.23	.03	.024	1.04	.020	.07

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmmb

**Saint Louis  
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December 28, 1984  
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Lab No. 84C3230  
84P3525  
P.O. No. C.48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 5/8" X 11 X 11, RIR #S-11926, Heat #494H2651, 17 & 18 *BETHLEHEM STEEL TAB No. 1*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#17	1.515	.623	.9438	1.043	.322	.3358	64.4	34140	36172	63000	66751	.95	47.5	D
#18	1.509	.627	.9461	1.132	.420	.4754	49.7	33600	35514	62300	65849	.85	42.5	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#17	.19	.01	.017	1.01	.008	.01
#18	.19	.01	.017	1.01	.007	.01

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

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December 28, 1984  
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BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1/2" X 9 X 9, RIR #S-13084, Heat #A84913, 19 & 20 *U.S. STEEL CORP TAB No. 2*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#19	1.510	.480	.7248	1.140	.313	.3568	50.7	25980	35844	46500	64155	.80	40.0	D
#20	1.505	.482	.7254	1.128	.323	.3643	49.7	25980	35814	47450	65412	.76	38.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#19	.22	.02	.013	.40	.011	.02
#20	.22	.02	.014	.40	.011	.02

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

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P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/4 X 12 X 12, RIR #S-13084, Heat #411L0351, 23 & 24 *BETHLEHEM STEEL TAB No. 2*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac.
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#23	1.515	.750	1.136	1.022	.470	.4803	57.7	47760	42042	79200	69718	.98	49.0	D
#24	1.517	.752	1.140	1.009	.473	.4772	58.1	45900	40263	78700	69035	.98	49.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#23	.19	.02	.017	1.11	.014	.01
#24	.21	.03	.014	1.03	.011	.02

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

**Saint Louis  
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December 28, 1984  
Report No. 84-7726  
Lab No. 84C3230  
84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample /Part ID: 3/4" X 12 X 12, RIR #S-13084, Heat #412L0791, 25 & 26 *BETHLEHEM STEEL TAB Lb. 2*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#25	1.510	.754	1.138	1.090	.492	.5362	52.8	48540	42653	86500	76010	.83	41.5	D
#26	1.503	.748	1.124	1.114	.520	.5792	48.4	44160	39288	75700	67348	.80	40.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#25	.20	.04	.013	1.01	.010	.02
#26	.18	.02	.017	1.11	.014	.01

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

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84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample /Part ID: 3/8" X 10 X 10, RIR #S-13084, Heat #422L5391, 27 & 28 *BETHLEHEM STEEL TAB NO. 2*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#27	1.514	.386	.5844	1.099	.194	.2132	63.5	28200	48254	42350	72467	.83	41.5	D
#28	1.511	.384	.5802	1.090	.195	.2125	63.3	26040	44881	41300	71182	.83	41.5	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#27	.20	.04	.009	.95	.008	.03
#28	.20	.04	.012	.97	.009	.03

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist



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December 28, 1984  
Report No. 84-7726  
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84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/8" X 6 X 8, RIR #S-13085, Heat #12788, 31 & 32 *CONVERS STEEL TAB No. 3*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#31	.481	.381	.1832	.368	.264	.0971	46.9	10080	55021	14700	80240	.53	26.5	D
#32	.492	.377	.1854	.340	.238	.0809	56.3	9750	51618	14350	77400	.58	29.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#31	.24	.30	.029	.49	.036	.24
#32	.22	.28	.029	.51	.036	.24

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmb



**Saint Louis  
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St. Louis, Missouri 63103  
314/531-8080

December 28, 1984  
Report No. 84-7726  
Lab No. 84C3230  
84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample / Part ID: 1/2 X 8 X 9, RIR #S-13457, Heat #23535, 33 & 34

*CANVERS STEEL TAB No. 3*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#33	1.531	.488	.7471	1.135	.292	.3314	55.6	33900	45375	53950	72212	.82	41.0	D
#34	1.532	.486	.7445	1.128	.281	.3169	57.4	34080	45775	54200	72800	.83	41.5	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#33	.20	.19	.018	.49	.013	.16
#34	.21	.19	.019	.49	.013	.16

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

J. W. Davidson  
Chief Chemist

**Saint Louis  
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December 28, 1984  
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P.O. No. C 48903

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample /Part ID: 3/8" X 14 X 16, RIR #S-12947, Heat #496K1721, 37 & 38

*BETHLEHEM STEEL TAB No. 3*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#37	1.512	.375	.567	1.193	.254	.3030	46.5	49500	87301	62600	110405	.57	28.5	D
#38	1.514	.372	.5632	1.180	.221	.2607	53.7	50220	89169	62700	111328	.58	29.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#37	.18	.46	.007	1.48	.015	.05
#38	.17	.46	.006	1.47	.015	.05

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*

J. W. Davidson  
Chief Chemist

JWD:mmmb

**Saint Louis  
Testing  
Laboratories, Inc.**



2810 Clark Avenue  
St. Louis, Missouri 63102  
314/531-8080

December 28, 1984  
Report No. 84-7726  
Lab No. 84C3230  
84P3525  
P.O. No. C.48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 5/8" X 14 X 18, RIR #S-13080, Heat #F39964, 41 & 42 *POHANG IRON & STEEL TAB No. A*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Trac.
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#41	1.511	.641	.9685	1.096	.385	.4219	56.4	37080	38286	67000	69179	.87	43.5	D
#42	1.507	.632	.9524	1.090	.364	.3967	58.3	37680	39563	65100	68353	.89	44.5	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#41	.21	.04	.014	.71	.016	.02
#42	.23	.04	.014	.74	.015	.02

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmmb

**Saint Louis  
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BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample /Part ID: 3/4 X 14 X 18, RIR #S-13167, Heat #S17301, 45 & 46 *POHANG IRON & STEEL TAB No. 4*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#45	1.515	.766	1.1604	1.200	.566	.6792	41.4	43080	37125	76900	66270	.81	40.5	D
#46	1.513	.768	1.1619	1.194	.539	.6435	44.6	44160	38006	75000	64549	.83	41.5	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#45	.21	.04	.030	.94	.015	.02
#46	.19	.04	.022	.90	.014	.01

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

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BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/4" X 14 X 14, RIR #S-13080, Heat #S17765, 49 & 50 *POHANY IRON & STEEL TAB No. 4*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#49	1.505	.774	1.1648	1.120	.544	.6092	47.6	45000	38633	81100	69625	.85	42.5	D
#50	1.512	.772	1.1672	1.154	.538	.6208	46.8	48000	41124	81900	70167	.82	41.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#49	.25	.05	.024	.97	.018	.02
#50	.25	.05	.021	.94	.017	.02

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmmb

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BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1" X 15 X 15, RIR #S-13167, Heat #S17871, 51 & 52 *POHANG IRON & STEEL TAB No. 4*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac.
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#51	1.005	1.005	1.0100	.708	.695	.4920	51.2	40020	39623	74000	73267	.88	44.0	D
#52	1.005	1.004	1.0090	.678	.587	.3979	60.5	35860	35559	71900	71258	.92	46.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#51	.24	.05	.022	1.00	.025	.02
#52	.22	.05	.017	.97	.024	.02

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmmb



**Saint Louis  
Testing  
Laboratories, Inc.**



2810 Clark Avenue  
St. Louis, Missouri 63103  
314-531-8080

December 28, 1984  
Report No. 84-7726  
Lab No. 84C3230  
84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/4" X 14 X 18, RIR #S-13167, Heat #S19547, 53 & 54 *POHANG IRON & STEEL TAB No. 4*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac.
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#53	1.510	.774	1.1687	1.104	.510	.5630	51.8	44400	37990	81300	69564	.88	44.0	D
#54	1.508	.773	1.1656	1.094	.465	.5087	56.3	45960	39430	80900	69406	.90	45.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#53	.29	.05	.036	.98	.037	.02
#54	.28	.04	.037	.98	.038	.02

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmmb



**Saint Louis  
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2810 Clark Avenue  
St. Louis, Missouri 63103  
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December 28, 1984  
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Lab No. 84C3230  
84P3525  
P.O. No. C.48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/4" X 14 X 18, RIR #S-13167, Heat #S19569, 55 & 56 *POHANG IRON & STEEL TAB No. 4*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac.
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#55	1.510	.763	1.1521	1.060	.429	.4547	60.5	42720	37080	76800	66660	.96	48.0	D
#56	1.512	.765	1.1566	1.063	.451	.4794	58.5	44220	38232	78800	68130	.93	46.5	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#55	.20	.05	.015	.96	.017	.02
#56	.20	.05	.014	.93	.017	.02

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*

J. W. Davidson  
Chief Chemist

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314/531-8080

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P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/8" X 8 X 8, RIR #S-13458, Heat #492N0492, 61 & 62 *BETHLEHEM STEEL TAB No. 5*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation In 2"		Frac.
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#61	.500	.378	.1890	.259	.147	.0380	79.8	6510	34444	9350	49470	.92	46.0	D
#62	.497	.382	.1898	.346	.226	.0781	58.8	6744	35532	10270	54109	.72	36.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#61	.04	.02	.010	.27	.010	.05
#62	.18	.02	.013	.48	.011	.02

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*

J. W. Davidson  
Chief Chemist

JWD:mmm

**Saint Louis  
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Laboratories, Inc.**



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84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1/2" X 14 X 18, RIR #S-13458, Heat #432L7521, 202 & 203 *BETHLEHEM STEEL TAB No. 5*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#202	1.513	.495	.7489	1.021	.246	.2511	66.4	22260	29723	42300	56482	.93	46.5	D
#203	1.533	.493	.7557	1.007	.229	.2306	69.4	21420	28344	32950	43601	1.06	53.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#202	.17	< .01	.014	.44	.025	.01
#203	.07	< .01	.009	.26	.007	.02

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J.W. Davidson*

J. W. Davidson  
Chief Chemist

JWD:mmmb

**Saint Louis  
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P.O. No. C. 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1/2" X 12 X 12, RIR #S-13738, Heat #S17824, 69 & 70 *POHANG IRON & STEEL TAB No. 7*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#69	1.492	.498	.7430	1.078	.274	.2953	60.2	28740	38681	47950	64535	.86	43.0	D
#70	1.490	.505	.7524	1.128	.343	.3869	48.5	28860	38357	44800	59542	.81	40.5	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#69	.18	.05	.019	.74	.019	.02
#70	.16	.07	.017	.78	.017	.02

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*

J. W. Davidson  
Chief Chemist

JWD:mmmb

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84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/4" X 9 X 9, RIR #S-14236, Heat #S17810, 77 & 78

*POHANG IRON & STEEL TAB No. 9*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#77	1.507	.753	1.134	1.120	.517	.5790	48.9	47100	41534	80300	70811	.87	43.5	D
#78	1.508	.756	1.140	1.066	.473	.5042	55.7	43740	38368	80500	70614	.96	48.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#77	.19	.22	.014	1.04	.020	.02
#78	.21	.22	.016	1.08	.021	.02

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmmb

**Saint Louis  
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P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1/2" X 14 X 14, RIR #S-14236, Heat #S19542, 79 & 80 *PHANX IRON & STEEL TAB No. 9*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#79	1.491	.500	.7455	1.070	.289	.3092	58.5	28140	37746	47850	64185	.83	41.5	D
#80	1.497	.505	.7559	1.114	.294	.3275	56.6	32760	43339	55450	73356	.81	40.5	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#79	.21	.05	.019	.82	.021	.02
#80	.28	.06	.017	.99	.021	.02

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*

J. W. Davidson  
Chief Chemist



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P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/8" X 7 X 7, RIR #S-13991, Heat #8158921, 81 & 82

*PHOENIX STEEL TAB No. 9*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#81	.499	.377	.1881	.360	.250	.090	52.1	8160	43381	12700	67517	.63	31.5	D
#82	.512	.378	.1935	.370	.265	.0980	49.3	8220	42480	12775	66020	.58	29.0	D

Yield taken at .2% offset.

<u>Sample ID</u>	<u>Carbon, %</u>	<u>Silicon, %</u>	<u>Sulfur, %</u>	<u>Manganese, %</u>	<u>Phosphorus, %</u>	<u>Copper, %</u>
#81	.24	.04	.012	.42	.023	.03
#82	.25	.04	.017	.43	.027	.03

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*

J. W. Davidson  
Chief Chemist

JWD:mmmb



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P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1/4" X 12 X 12, RIR #S-14653, Heat #540K8490, 83 & 84 *BETHLEHEM STEEL TAB No. 10*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac.
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#83	1.515	.251	.3802	1.081	.138	.1491	60.7	13440	35349	21150	55628	.88	44.0	D
#84	1.515	.250	.3787	1.087	.124	.1347	64.4	12870	33984	21175	55914	.91	45.5	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#83	.16	.01	.020	.37	.007	.03
#84	.15	.01	.022	.37	.007	.03

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmmb

**Saint Louis  
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BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/8" X 10 X 10, RIR #S-14577, Heat #411N7321, 85 & 86

*BETHLEHEM STEEL TAB No. 11*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#85	1.508	.371	.5594	1.165	.231	.2691	51.8	22920	40972	38850	69449	.76	38.0	D
#86	1.500	.371	.5565	1.140	.235	.2679	51.8	23400	42048	39500	70979	.79	39.5	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#85	.20	.03	.014	.93	.011	.01
#86	.22	.03	.014	.97	.012	.01

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*

J. W. Davidson  
Chief Chemist

JWD:mmmb

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P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/8" X 12 X 12, RIR #S-14654, Heat #486K2790, 87 & 88 *BETHLEHEM STEEL TAB No. 11*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac.
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#87	1.507	.372	.5606	1.106	.209	.2311	58.7	15000	26757	31150	55565	.88	44.0	D
#88	1.510	.371	.5602	1.141	.231	.2635	52.9	15420	27525	30750	54891	.83	41.5	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#87	.21	.04	.015	.39	.009	.02
#88	.25	.05	.017	.40	.010	.03

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*

J. W. Davidson  
Chief Chemist

JWD:mmmb

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P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/8" X 10 X 10, RIR #S-14577, Heat #490N1831, 89 & 90 *BETHLEHEM STEEL TAB No. 11*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#89	1.503	.374	.5621	1.138	.235	.2674	52.4	22860	40668	38000	67603	.80	40.0	D
#90	1.514	.372	.5632	1.127	.244	.2749	51.1	23400	41548	37750	67027	.82	41.0	D

Yield taken at .2% offset.

<u>Sample ID</u>	<u>Carbon, %</u>	<u>Silicon, %</u>	<u>Sulfur, %</u>	<u>Manganese, %</u>	<u>Phosphorus, %</u>	<u>Copper, %</u>
#89	.23	.01	.015	.79	.009	.02
#90	.19	.01	.014	.72	.008	.02

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

J. W. Davidson  
Chief Chemist

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BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1/2" X 2 X 6, RIR #S-14654, Heat #550K2890, 92 & 93 *BETHLEHEM STEEL TAB No. 11*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#92	.505	.494	.2494	.395	.365	.1441	42.2	8130	32598	13975	56034	.59	29.5	D
#93	.508	.494	.2509	.370	.341	.1261	49.7	8256	32905	13575	54105	.60	30.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#92	.18	.01	.023	.49	.019	.01
#93	.17	< .01	.015	.46	.017	.01

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmmb

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BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/4" X 12 X 12, RIR #S-14833, Heat #9215521, 94 & 95 *PHOENIX STEEL TAB No. 11*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#94	1.506	.762	1.1475	1.049	.515	.5402	52.9	46740	40732	70900	61786	.94	47.0	D
#95	1.505	.758	1.1407	1.010	.408	.4120	63.8	45240	39659	71100	62330	1.00	50.0	D

Yield taken at .2% offset.

<u>Sample ID</u>	<u>Carbon, %</u>	<u>Silicon, %</u>	<u>Sulfur, %</u>	<u>Manganese, %</u>	<u>Phosphorus, %</u>	<u>Copper, %</u>
#94	.09	.20	.010	.36	.012	.16
#95	.11	.20	.012	.37	.012	.16

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmmb



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BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample /Part ID: 1/2" X 10 X 10, RIR #S-15056, Heat #8201721, 98 & 99 *PHOENIX STEEL TAB No. 12*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#98	1.504	.500	.7520	1.055	.258	.2721	63.8	31440	41808	47000	62500	.92	46.0	D
#99	1.512	.506	.7650	1.068	.268	.2862	62.5	32040	41882	48600	63529	.92	46.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#98	.11	.20	.017	.36	.013	.17
#99	.11	.20	.017	.37	.014	.17

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

J. W. Davidson  
Chief Chemist

JWD:mmmb



**Saint Louis  
Testing  
Laboratories, Inc.**



2810 Clark Avenue  
St. Louis, Missouri 63103  
314/531-8080

December 28, 1984  
Report No. 84-7726  
Lab. No. 84C3230  
84P3525  
P.O. No. C.48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1" X 15 X 15, RIR #S-15935, Heat #8226725, 102 & 103 *PHOENIX STEEL TAB No. 14*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#102	.990	1.005	.9949	.686	.666	.4568	54.0	41160	41370	69700	70057	.88	44.0	D
#103	1.000	1.011	1.011	.733	.714	.5233	48.2	41520	41068	70900	70128	.82	41.0	D

Yield taken at .2% offset.

<u>Sample ID</u>	<u>Carbon, %</u>	<u>Silicon, %</u>	<u>Sulfur, %</u>	<u>Manganese, %</u>	<u>Phosphorus, %</u>	<u>Copper, %</u>
#102	.14	.21	.021	.98	.015	.28
#103	.13	.21	.020	.96	.014	.28

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

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December 28, 1984  
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84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1" X 14 X 18, RIR #S-16688, Heat #D31562C, 104 & 105

*LUKENS STEEL TAB No. 15*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac.
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#104	1.018	1.022	1.040	.670	.640	.4288	58.7	48480	46615	77400	74423	.88	44.0	D
#105	1.006	1.016	1.022	.634	.610	.3867	62.1	47520	46497	74700	73091	.95	47.5	D

Yield taken at .2% offset.

<u>Sample ID</u>	<u>Carbon, %</u>	<u>Silicon, %</u>	<u>Sulfur, %</u>	<u>Manganese, %</u>	<u>Phosphorus, %</u>	<u>Copper, %</u>
#104	.17	.23	.017	.93	.018	.29
#105	.14	.22	.014	.89	.015	.27

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmmb

**Saint Louis  
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P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/8" X 8 X 9, RIR #S-16688, heat #14768, 106 & 107 *COVERS STEEL TAB No. 15*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac.
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#106	1.520	.368	.5593	1.143	.191	.2183	60.9	28200	50420	41000	73305	.79	39.5	D
#107	1.526	.372	.5676	1.161	.213	.2472	56.4	29160	51374	42000	73995	.76	38.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#106	.16	.19	.031	.72	.022	.40
#107	.18	.19	.032	.76	.022	.40

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmm

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84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1/2" X 8 X 16, RIR #S-16688, Heat #15268, 108 & 109

*COLLAPSE STEEL TAB No. 15*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac.
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#108	1.534	.493	.7562	1.115	.321	.3579	52.6	34380	45464	52000	68764	.86	43.0	D
#109	1.525	.495	.7548	1.094	.285	.3117	71.5	33420	44276	50100	66375	.87	43.5	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#108	.15	.24	.034	.83	.023	.38
#109	.17	.23	.021	.58	.016	.17

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*

J. W. Davidson  
Chief Chemist

JWD:mmmb

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84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1" X 8 X 16, RIR #S-16688, Heat #9232824, 110 & 111 *PHOENIX STEEL TAB No. 15*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#110	1.011	.998	1.008	.643	.596	.3832	61.9	38340	38035	64800	64285	.98	49.0	D
#111	.999	1.017	1.015	.649	.622	.4036	60.2	38400	37832	64900	63940	.98	49.0	D

Yield taken at .2% offset.

<u>Sample ID</u>	<u>Carbon, %</u>	<u>Silicon, %</u>	<u>Sulfur, %</u>	<u>Manganese, %</u>	<u>Phosphorus, %</u>	<u>Copper, %</u>
#110	.11	.24	.011	.77	.010	.10
#111	.10	.24	.012	.76	.010	.10

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*

J. W. Davidson  
Chief Chemist

**Saint Louis  
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2810 Clark Avenue  
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December 28, 1984  
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Lab No. 84C3230  
84P3525  
T.O. No. C.48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/8" X 8 X 9, RIR #S-16892, Heat #27101, 112 & 113

*CONCRETE STEEL TAB No. 15*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#112	1.506	.364	.5481	1.108	.221	.2448	55.3	23340	42583	36550	66684	.80	40.0	D
#113	1.512	.367	.5549	1.104	.193	.2130	61.6	26760	48224	40600	73166	.84	42.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#112	.14	.27	.023	.48	.018	.12
#113	.14	.27	.028	.65	.023	.30

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist



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December 28, 1984  
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Lab No. 84C3230  
84P3525  
P.O. No. C.48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample /Part ID: 5/8" X 11 X 11, RIR #S-20137, Heat #402W8091/ABN, 116 *BETHLEHEM STEEL TAB No. 17*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#116	1.507	.627	.9448	1.117	.421	.4702	50.2	54900	58107	74500	78852	.78	39.0	D

Yield taken at .2% offset.

<u>Sample ID</u>	<u>Carbon, %</u>	<u>Silicon, %</u>	<u>Sulfur, %</u>	<u>Manganese, %</u>	<u>Phosphorus, %</u>	<u>Copper, %</u>
#116	.22	.23	.017	1.51	.015	.01

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmb

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P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/4" X 13 X 13, RIR #S-20137, Heat #421W0001, 118 & 119 *BETHLEHEM STEEL TAB No. 17*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#118	1.510	.752	1.135	1.156	.553	.6392	43.6	42960	37850	75900	66872	.79	39.5	D
#119	1.511	.755	1.1408	1.158	.546	.6322	43.9	37140	32556	76900	67408	.76	38.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#118	.29	< .01	.020	1.13	.012	.02
#119	.21	< .01	.014	1.02	.009	.02

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmmb

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84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/4" X 13 X 13, RIR #S-20137, Heat #421W1681, 120 *BETHLEHEM STEEL TAB No. 17*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#120	1.500	.746	1.1190	1.093	.507	.5541	50.4	47280	42252	76500	68364	.87	43.5	D

Yield taken at .2% offset.

<u>Sample ID</u>	<u>Carbon, %</u>	<u>Silicon, %</u>	<u>Sulfur, %</u>	<u>Manganese, %</u>	<u>Phosphorus, %</u>	<u>Copper, %</u>
#120	.22	.04	.011	1.01	.012	.01

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmb

**Saint Louis  
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December 28, 1984  
Report No. 84-7726  
Lab No. 84C3230  
84P3525  
P.O. No. C.48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/4" X 13 X 13, RIR #S-20137, Heat #422W7811, 122 & 123 *BETHLEHEM STEEL TAB No. 17*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac.
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#122	1.520	.765	1.1628	1.120	.509	.5700	50.9	67800	58307	85500	73529	.84	42.0	D
#123	1.480	.771	1.1410	1.004	.442	.4437	61.1	54000	47326	82200	72042	1.14	57.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#122	.23	.05	.014	1.04	.015	.02
#123	.23	.05	.016	1.05	.015	.02

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

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December 28, 1984  
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84P3525  
P.O. No. C.48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1/4" X 11 X 11, RIR #S-20137, Heat #422X4731/ABH, 124 & 125 *BETHLEHEM STEEL TAB No. 17*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#124	1.485	.255	.3786	1.124	.145	.1629	56.9	18270	48256	27000	71315	.75	37.5	D
#125	1.483	.252	.3737	1.118	.144	.1609	56.9	18510	49531	26700	71447	.74	37.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#124	.21	.01	.012	.96	.014	.01
#125	.21	.01	.014	.96	.014	.01

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson

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P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1/4" X 9 X 9, RIR #S-20137, Heat #422X5051/ABG, 126 & 127 *BETHLEHEM STEEL TAB No. 17*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#126	1.522	.257	.3911	1.162	.133	.1545	60.4	22890	58527	29550	75556	.70	35.0	D
#127	1.526	.252	.3845	1.176	.150	.1764	54.1	21960	57113	28350	73732	.73	36.5	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#126	.18	.03	.016	.97	.015	.01
#127	.18	.04	.016	.96	.014	.01

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmmb



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P.O. No. C.48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 5/8" X 12 X 12, RIR #S-20137, Heat #9371221/ABL, 128 & 129 *PHOENIX STEEL TAB No. 17*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac.
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#128	1.504	.635	.9550	1.088	.384	.4177	56.2	36720	38450	62400	65340	.86	43.0	D
#129	1.488	.634	.9433	1.052	.390	.4102	56.5	39900	42298	60700	64348	.90	45.0	D

Yield taken at .2% offset.

<u>Sample ID</u>	<u>Carbon, %</u>	<u>Silicon, %</u>	<u>Sulfur, %</u>	<u>Manganese, %</u>	<u>Phosphorus, %</u>	<u>Copper, %</u>
#128	.11	.25	.010	.34	.010	.17
#129	.12	.25	.010	.35	.010	.17

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*

J. W. Davidson  
Chief Chemist

JWD:mmm

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BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 5/8" X 12 X 12, RIR #S-20137, Heat #9385521/ABK, 130 & 131 *PHOENIX STEEL TAB No. 17*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac.
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#130	1.511	.636	.9609	1.038	.372	.3861	59.8	40620	42272	59800	62233	.94	47.0	D
#131	1.502	.630	.9462	1.030	.356	.3666	61.2	39000	41217	59050	62407	.94	47.0	D

Yield taken at .2% offset.

<u>Sample ID</u>	<u>Carbon, %</u>	<u>Silicon, %</u>	<u>Sulfur, %</u>	<u>Manganese, %</u>	<u>Phosphorus, %</u>	<u>Copper, %</u>
#130	.11	.24	.013	.37	.007	.10
#131	.12	.25	.016	.38	.007	.11

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmm

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BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1/2" X 10 X 10, RIR #S-20344, Heat #9440021/ACU, 132 *PHOENIX STEEL TAB No. 17*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac.
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#132	1.500	.504	.7560	1.092	.294	.3210	57.5	33060	43730	52000	68783	.81	40.5	D

Yield taken at .2% offset.

<u>Sample ID</u>	<u>Carbon, %</u>	<u>Silicon, %</u>	<u>Sulfur, %</u>	<u>Manganese, %</u>	<u>Phosphorus, %</u>	<u>Copper, %</u>
#132	.13	.23	.009	.40	.009	.22

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmmb

**Saint Louis  
Testing  
Laboratories, Inc.**



2810 Clark Avenue  
St. Louis, Missouri 63103  
314/531-8080

December 28, 1984  
Report No. 84-7726  
Lab No. 84C3230  
84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1/2" X 11 X 11, RIR #S-20344, Heat #9440021/ACU 133 *PHOENIX STEEL TAB No. 17*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac.
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#133	1.513	.502	.7595	1.073	.282	.3025	60.1	33180	43686	51450	67741	.87	43.5	D

Yield taken at .2% offset.

<u>Sample ID</u>	<u>Carbon, %</u>	<u>Silicon, %</u>	<u>Sulfur, %</u>	<u>Manganese, %</u>	<u>Phosphorus, %</u>	<u>Copper, %</u>
#133	.13	.23	.009	.39	.010	.21

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*

J. W. Davidson  
Chief Chemist

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St. Louis, Missouri 63103  
314/531-8080

December 28, 1984  
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84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/4" X 18 X 18, RIR #S-20138, Heat #8392521/AAY, 134 & 135 *PHOENIX STEEL TAB No. 18*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac.
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#134	1.508	.759	1.144	1.056	.424	.4477	60.8	47280	41328	76100	66520	.94	47.0	D
#135	1.515	.752	1.139	1.094	.471	.5152	54.7	44880	39402	75500	66286	.90	45.0	D

Yield taken at .2% offset.

<u>Sample ID</u>	<u>Carbon, %</u>	<u>Silicon, %</u>	<u>Sulfur, %</u>	<u>Manganese, %</u>	<u>Phosphorus, %</u>	<u>Copper, %</u>
#134	.12	.16	.012	.42	.011	.27
#135	.13	.16	.010	.44	.011	.28

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

J. W. Davidson  
Chief Chemist

JWD:mmmb

**Saint Louis  
Testing  
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December 28, 1984  
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Lab No. 84C3230  
84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample /Part ID: 3/8" X 9 X 9, RIR #S-20239, Heat #9239621/ABT, 136 & 137 *PHOENIX STEEL TAB No. 18*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#136	1.527	.393	.6001	1.142	.246	.2809	53.1	27240	45392	39600	65989	.81	40.5	D
#137	1.497	.408	.6107	1.096	.227	.2487	59.2	27480	44997	40100	65662	.83	41.5	D

Yield taken at .2% offset.

<u>Sample ID</u>	<u>Carbon, %</u>	<u>Silicon, %</u>	<u>Sulfur, %</u>	<u>Manganese, %</u>	<u>Phosphorus, %</u>	<u>Copper, %</u>
#136	.11	.18	.011	.48	.026	.23
#137	.11	.18	.011	.47	.025	.23

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*

J. W. Davidson  
Chief Chemist



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December 28, 1984  
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Lab No. 84C3230  
84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/8" X 9 X 9, RIR #S-20239, Heat #8293221/ABU, 138 & 139 *PHOENIX STEEL TAB No. 18*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#138	1.502	.384	.5767	1.091	.202	.2203	61.7	27420	47546	38500	66759	.80	40.0	D
#139	1.507	.377	.5681	1.095	.187	.2047	63.9	26040	45837	37300	65657	.82	41.0	D

Yield taken at .2% offset.

<u>Sample ID</u>	<u>Carbon, %</u>	<u>Silicon, %</u>	<u>Sulfur, %</u>	<u>Manganese, %</u>	<u>Phosphorus, %</u>	<u>Copper, %</u>
#138	.11	.27	.013	.41	.008	.26
#139	.11	.27	.012	.40	.008	.26

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

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314/531-6060

December 28, 1984  
Report No. 84-7726  
Lab No. 84C3230  
84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/8" X 9" 9, RIR #S-20239, Heat #8346621/ABV, 140 & 141 *PHOENIX STEEL TAB No. 18*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#140	1.517	.377	.5719	1.119	.215	.2405	57.9	26400	46161	37450	65483	.83	41.5	D
#141	1.517	.378	.5734	1.114	.219	.2439	57.4	25980	45308	37750	65835	.83	41.5	D

Yield taken at .2% offset.

<u>Sample ID</u>	<u>Carbon, %</u>	<u>Silicon, %</u>	<u>Sulfur, %</u>	<u>Manganese, %</u>	<u>Phosphorus, %</u>	<u>Copper, %</u>
#140	.10	.25	.013	.45	.008	.23
#141	.10	.25	.014	.45	.008	.23

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmmb

**Saint Louis  
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Lab No. 84C3230  
84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/8" X 9 X 9, RIR #S-20239, Heat #9324421/ABW, 142 & 143 *PHOENIX STEEL TAB No. 18*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#142	1.532	.402	.6158	1.143	.254	.2903	52.8	28200	45794	42050	63285	.78	39.0	D
#143	1.530	.395	.6043	1.093	.186	.2032	66.3	28080	46466	40200	66523	.88	44.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#142	.12	.27	.013	.46	.012	.17
#143	.12	.28	.016	.47	.013	.18

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*

J. W. Davidson  
Chief Chemist

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P.O. No. C 48908

BALDWIN ASSOCIATES  
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Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/8" X 12 X 12, RIR #S-20239, Heat #432N4251/ABX, 144 & 145 *BETHLEHEM STEEL TAB No. 18*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#144	1.488	.391	.5818	1.091	.232	.2531	56.4	25080	43107	39900	68580	.81	40.5	D
#145	1.513	.393	.5946	1.060	.193	.2045	65.6	24120	40565	40100	67440	.88	44.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#144	.13	.20	.014	.94	.009	.02
#145	.13	.20	.015	.97	.010	.02

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*

J. W. Davidson  
Chief Chemist

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BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/8" X 9 X 9, RIR #S-20239, Heat #8229319/ACA, 146 & 147 *PHOENIX STEEL TAB No. 18*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#146	1.500	.392	.5880	1.082	.225	.2434	58.6	26760	45510	36950	62840	.86	43.0	D
#147	1.503	.389	.5846	1.055	.185	.1951	66.6	25200	43106	36500	62435	.92	46.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#146	.12	.11	.011	.38	.011	.19
#147	.12	.12	.011	.39	.012	.19

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

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Lab No. 84C3230  
84P3525  
P.O. No. C-48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/8" X 12 X 12, RIR #S-20239, Heat #9242221/ACB, 148 & 149 *PHOENIX STEEL TAB No. 18*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#148	1.528	.381	.5821	1.101	.195	.2146	63.1	28260	48548	38450	66053	.87	43.5	D
#149	1.500	.395	.5925	1.155	.257	.2968	49.9	29340	49518	43800	73924	.73	36.5	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#148	.11	.25	.015	.36	.012	.18
#149	.24	.20	.021	.43	.015	.16

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*

J. W. Davidson  
Chief Chemist

JWD:mmmb



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BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/8" X 9 X 9, RIR #S-20239, Heat #9301021/ACC, 150 & 151 *PHOENIX STEEL TAB No. 18*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#150	1.529	.386	.5901	1.118	.211	.2358	60.0	26220	44433	37400	63379	.84	42.0	D
#151	1.500	.387	.5805	1.075	.229	.2461	57.6	26340	45374	35700	61498	.84	42.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#150	.09	.21	.009	.48	.010	.18
#151	.09	.21	.009	.47	.010	.18

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*

J. W. Davidson  
Chief Chemist

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BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/8" X 9 X 9, RIR #S-20239, Heat #9323623/ACD, 152 & 153 *PHOENIX STEEL TAB No. 18*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#152	1.515	.389	.5893	1.147	.241	.2764	53.0	34920	59256	42500	72119	.72	36.0	D
#153	1.504	.380	.5715	1.124	.237	.2663	53.4	30420	53228	40150	70253	.75	37.5	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#152	.10	.25	.014	.61	.012	.18
#153	.11	.25	.013	.62	.013	.19

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmmb

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Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample /Part ID: 3/8" X 12 X 12, RIR #S-20239, Heat #412T0331/ABY, 154 & 155 *BETHLEHEM STEEL TAB No. 18*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#154	1.519	.383	.5817	1.130	.204	.2305	60.3	26040	44765	39000	67044	.84	42.0	D
#155	1.500	.382	.5730	1.112	.224	.2490	56.5	23280	40628	38450	67102	.83	41.5	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#154	.18	.01	.015	1.03	.011	.01
#155	.19	.01	.017	1.02	.012	.01

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*

J. W. Davidson  
Chief Chemist

JWD:mmb

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84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
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Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/4" X 18 X 18, RIR #S-20239, Heat #9381321/AAZ, 156 & 157 *PHOENIX STEEL TAB No. 1B*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#156	1.529	.780	1.192	1.078	.490	.5282	55.6	46320	38359	73700	61828	.94	47.0	D
#157	1.512	.778	1.176	1.026	.491	.5037	57.1	45600	38775	72200	61394	1.02	51.0	D

Yield taken at .2% offset.

<u>Sample ID</u>	<u>Carbon, %</u>	<u>Silicon, %</u>	<u>Sulfur, %</u>	<u>Manganese, %</u>	<u>Phosphorus, %</u>	<u>Copper, %</u>
#156	.13	.23	.018	.39	.009	.16
#157	.14	.23	.017	.40	.009	.15

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*

J. W. Davidson  
Chief Chemist

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December 28, 1984  
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Lab No. 84C3230  
84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/4" X 18 X 18, RIR #S-20239, Heat #8364721/AAX, 160 & 161 *PHOENIX STEEL TAB NO. 18*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#160	1.500	.761	1.141	1.105	.516	.5701	50.0	42780	37493	72300	63540	.87	43.5	D
#161	1.496	.761	1.138	1.030	.482	.4964	56.3	43260	36110	72000	63268	.98	49.0	D

Yield taken at .2% offset.

<u>Sample ID</u>	<u>Carbon, %</u>	<u>Silicon, %</u>	<u>Sulfur, %</u>	<u>Manganese, %</u>	<u>Phosphorus, %</u>	<u>Copper, %</u>
#160	.13	.23	.022	.38	.012	.26
#161	.13	.23	.021	.38	.012	.26

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*

J. W. Davidson  
Chief Chemist

JWD:mmmb

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December 28, 1984  
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Lab No. 84C3230  
84P3525  
P.O. No. C 48906

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1" X 14 X 14, RIR #S-20239, 8392067/ABA, 162 & 163 *PHOENIX STEEL TAB No. 18*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#162	.987	1.000	.987	.662	.657	.4349	55.9	55200	55927	81600	82674	.78	39.0	D
#163	.998	1.010	1.007	.651	.652	.4244	57.8	57720	57318	83000	82423	.82	41.0	D

Yield taken at .2% offset.

<u>Sample ID</u>	<u>Carbon, %</u>	<u>Silicon, %</u>	<u>Sulfur, %</u>	<u>Manganese, %</u>	<u>Phosphorus, %</u>	<u>Copper, %</u>
#162	.13	.28	.013	1.16	.009	.24
#163	.13	.30	.013	1.20	.009	.24

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmmb



**Saint Louis  
Testing  
Laboratories, Inc.**



2810 Clark Avenue  
St. Louis, Missouri 63103  
314/531-8080

December 28, 1984  
Report No. 84-7726  
Lab No. 84C3230  
84P3525  
P.O. No. C.48908

BALDWIN ASSOCIATES.  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1" X 14 X 14, RIR #S-20239, Heat #9419425/ABB, 164 & 165 *PHOENIX STEEL TAB No 18*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#164	1.083	1.029	1.114	.723	.649	.4692	57.8	45120	40502	81400	73070	.92	46.0	D
#165	0.999	1.028	1.026	.680	.667	.4535	55.7	41460	40409	74300	72417	.88	44.0	D

Yield taken at .2% offset.

<u>Sample ID</u>	<u>Carbon, %</u>	<u>Silicon, %</u>	<u>Sulfur, %</u>	<u>Manganese, %</u>	<u>Phosphorus, %</u>	<u>Copper, %</u>
#164	.14	.24	.012	1.01	.011	.22
#165	.14	.24	.010	1.00	.012	.21

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*

J. W. Davidson  
Chief Chemist

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December 28, 1984  
Report No. 84-7726  
Lab No. 84C3230  
84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1" X 14 X 14, RIR #S-20239, Heat #8387467/ABC, 166 & 167 *PHOENIX STEEL TAB No. 18*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac.
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#166	.992	1.025	1.016	.650	.653	.4244	58.2	4900	49015	85300	83956	.79	39.5	D
#167	.989	1.015	1.003	.666	.655	.4362	56.5	4800	48059	84000	83748	.80	40.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#166	.13	.27	.010	1.11	.018	.24
#167	.12	.27	.012	1.08	.017	.24

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*

J. W. Davidson  
Chief Chemist

JWD:mmb

**Saint Louis  
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2810 Clark Avenue  
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December 28, 1984  
Report No. 84-7726  
Lab No. 84C3230  
84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 3/4" X 12 X 12, RIR #S-20497, Heat #9342121/ABZ, 168 & 169 *PHOENIX STEEL TAB No. 18*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#168	1.568	.749	1.174	1.056	.510	.5385	54.1	46260	39403	75100	63969	.93	46.5	D
#169	1.496	.748	1.119	1.010	.474	.4787	57.2	44820	40053	74300	66398	.95	47.5	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#168	.11	.23	.012	.44	.012	.18
#169	.13	.25	.014	.47	.014	.19

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmmb

**Saint Louis  
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Laboratories, Inc.**



2810 Clark Avenue  
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314/531-8080

December 28, 1984  
Report No. 84-7726  
Lab No. 84C3230  
84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1/2" X 14 X 14, RIR #S20497, Heat #944062R/ACW, 176 & 177 *PHOENIX STEEL TAB No. 18*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac.
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#176	1.511	.517	.781	1.043	.334	.3483	55.4	31260	40025	51550	66005	.92	46.0	D
#177	1.521	.517	.7863	1.109	.312	.3460	55.9	34800	44257	52550	66831	.87	43.5	D

Yield taken at .2% offset.

<u>Sample ID</u>	<u>Carbon, %</u>	<u>Silicon, %</u>	<u>Sulfur, %</u>	<u>Manganese, %</u>	<u>Phosphorus, %</u>	<u>Copper, %</u>
#176	.10	.23	.014	.46	.013	.27
#177	.10	.22	.013	.45	.012	.27

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmb

**Saint Louis  
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Laboratories, Inc.**



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314/531-8080

December 28, 1984  
Report No. 84-7726  
Lab No. 84C3230  
84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1/2" X 12 X 12, RIR #S-20497, Heat #9385921/ACE, 178 & 179 *PHOENIX STEEL TAB No. 18*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac.
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#178	1.510	.508	.7670	1.056	.260	.2745	64.2	32460	42320	49650	64732	.91	45.5	D
#179	1.503	.506	.7605	1.052	.268	.2819	62.9	35460	46627	50050	65811	.92	46.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#178	.12	.23	.020	.43	.020	.31
#179	.12	.23	.022	.43	.021	.31

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*

J. W. Davidson  
Chief Chemist

JWD:mmmb

**Saint Louis  
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December 28, 1984  
Report No. 84-7726  
Lab No. 84C3230  
84P3525  
P.O. No. C. 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1/2" X 10 X 10, RIR #S-20497, Heat #9421421/ACM 182 & 183 *PHENIX STEEL TAB No. 18*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac.
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#182	1.495	.511	.7639	1.066	.294	.3134	58.9	20520	26862	49450	64733	.87	43.5	D
#183	1.497	.518	.7754	1.074	.315	.3383	56.3	31980	41243	49250	63515	.87	43.5	D

Yield taken at .2% offset.

<u>Sample ID</u>	<u>Carbon, %</u>	<u>Silicon, %</u>	<u>Sulfur, %</u>	<u>Manganese, %</u>	<u>Phosphorus, %</u>	<u>Copper, %</u>
#182	.12	.22	.005	.45	.009	.26
#183	.11	.23	.005	.44	.008	.27

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

J. W. Davidson  
Chief Chemist

JWD:mmmb



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December 28, 1984  
Report No. 84-7726  
Lab No. 84C3230  
84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1/2" X 10 X 10, RIR #S-20497, Heat #8352821/ACV, 186 & 187 *PHOENIX STEEL TAB NO. 18*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac.
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#186	1.513	.501	.7580	1.056	.263	.2777	63.3	28020	36965	48650	64182	.90	45.0	D
#187	1.505	.498	.74949	1.092	.303	.3308	55.8	24360	32502	47800	63776	.84	42.0	D

Yield taken at .2% offset.

<u>Sample ID</u>	<u>Carbon, %</u>	<u>Silicon, %</u>	<u>Sulfur, %</u>	<u>Manganese, %</u>	<u>Phosphorus, %</u>	<u>Copper, %</u>
#186	.13	.29	.016	.35	.010	.16
#187	.13	.28	.018	.35	.011	.16

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,,

*J. W. Davidson*

J. W. Davidson  
Chief Chemist

JWD:mmm

**Saint Louis  
Testing  
Laboratories, Inc.**



2810 Clark Avenue  
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December 28, 1984  
Report No. 84-7728  
Lab No. 84C3230  
84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1/2" X 12 X 12. RIR #S20497, Heat #9193821/ACJ, 190 & 191 *PHOENIX STEEL TAB No. 18*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#190	1.512	.520	.7862	1.102	.314	.3460	55.9	33480	42584	50150	63787	.84	42.0	D
#191	1.514	.519	.7857	1.102	.324	.3570	54.5	31920	40626	50850	64719	.85	42.5	D

Yield taken at .2% offset.

<u>Sample ID</u>	<u>Carbon, %</u>	<u>Silicon, %</u>	<u>Sulfur, %</u>	<u>Manganese, %</u>	<u>Phosphorus, %</u>	<u>Copper, %</u>
#190	.11	.20	.013	.42	.015	.23
#191	.10	.19	.013	.41	.015	.23

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

**Saint Louis  
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December 28, 1984  
Report No. 84-7726  
Lab No. 84C3230  
84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1/2 X 14 X 14, RIR #S-20497, Heat #432W8141/ACT, 194 & 195 *BETHLEHEM STEEL TAB No. 18*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#194	1.513	.516	.7807	1.080	.281	.3034	61.1	32880	42116	56650	72563	.87	43.5	D
#195	1.519	.515	.7822	1.093	.262	.2863	63.3	33300	42572	56650	72423	.88	44.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#194	.26	.04	.017	1.04	.017	.02
#195	.26	.04	.016	1.03	.015	.02

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

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December 28, 1984  
Report No. 84-7726  
Lab No. 84C3230  
84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1/2 X 10 X 10, RIR #S-20497, Heat #9316221/ACS, 196 & 197 *PHOENIX STEEL TAB No. 18*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation in 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#196	1.515	.503	.7620	1.073	.269	.2886	62.1	22440	29448	48500	63648	.90	45.0	D
#197	1.512	.500	.7560	1.050	.245	.2572	65.9	27000	35714	48550	64219	.90	45.0	D

Yield taken at .2% offset.

Sample ID	Carbon, %	Silicon, %	Sulfur, %	Manganese, %	Phosphorus, %	Copper, %
#196	.12	.23	.013	.47	.011	.23
#197	.10	.24	.013	.43	.009	.23

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmmb

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December 28, 1984  
Report No. 84-7726  
Lab No. 84C3230  
84P3525  
P.O. No. C 48908

BALDWIN ASSOCIATES  
P.O. Box 306  
Clinton, Illinois 61727

Attention: Quality Assurance Manager

REPORT OF TESTS

Sample/Part ID: 1/2" X 9 X 9, RIR #S-20497, Heat #412T3081/ACF, 198 & 199 *BETHLEHEM STEEL TAB No. 18*

Sample ID	Original			Reduced			Reduct. in Area %	Yield Point		Tensile		Elongation In 2"		Frac
	Width	Thick.	Area	Width	Thick.	Area		Actual	PSI	Actual	PSI	Inches	%	
#198	1.488	.531	.7901	1.088	.327	.3557	54.9	18000	22781	54250	68662	.84	42.0	D
#199	1.495	.533	.7968	1.060	.296	.3137	60.6	31800	39909	53850	67582	.85	42.5	D

Yield taken at .2% offset.

<u>Sample ID</u>	<u>Carbon, %</u>	<u>Silicon, %</u>	<u>Sulfur, %</u>	<u>Manganese, %</u>	<u>Phosphorus, %</u>	<u>Copper, %</u>
#198	.20	.03	.016	.85	.010	.01
#199	.22	.03	.019	.88	.012	.01

The testing was performed in accordance with St. Louis Testing Laboratories, Inc., Quality Assurance Program, 1-09-80 Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

*J. W. Davidson*  
J. W. Davidson  
Chief Chemist

JWD:mmh

Appendix A

Heats of Material Retested

<u>Tab Index No</u>	<u>Mfg.'s Heat No.</u>	<u>St. Louis Testing Sample ID No.</u>
5	492N0492	61,62
5	432L7521	202,203
10	540K8490	83,84
11	486K2790	87,88
17	421W0001	118,119
18	9421421	182,183
18	9316221	196,197
18	412T3081	198,199



C. D. TROWBRIDGE, Director

# St. Louis Testing Laboratories, Inc.



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631-8080 Code 314

*Chemical, Metallurgical, Physical, Non-Destructive, Spectrographic,  
Agricultural Testing and Analyses  
Investigations, Research and Development, Inspection, Field Services*



**ST. LOUIS TEST**

March 7, 1985  
Report No. 85-1337  
Lab No. 85P581  
PO No. C48908 Rider 1

BALDWIN ASSOCIATES  
PO Box 306  
Clinton, IL 61727

Attention: Manager of Quality Assurance

## REPORT OF ANALYSIS

MATERIAL: Carbon steel plates

SUBJECT: Mill rolling direction

### PROCEDURE AND RESULTS:

The sheets were identified and samples were marked with corresponding sheet numbers. A cross section, 1/2" wide X 1" long, was removed from each of the sheets in the longitudinal and/or transverse directions, ground, and polished in accordance with ASTM E-3 for micro-examination. Examined in the unetched condition at 30x to 800x magnification. Etched in accordance with ASTM E-407, Table 2, Composition 74a and re-examined. The unetched and etched cross sections revealed the nonmetallic inclusions and grain directions as to rolling. These samples were marked as to rolling direction along with the submitted plate samples for further testing. For details of this analysis see Appendix A.

Respectfully submitted,

  
C. D. TROWBRIDGE  
Metallurgist

**Saint Louis  
Testing  
Laboratories, Inc.**



2810 Clark Avenue  
St. Louis, Missouri 63103  
314/531-8080

Baldwin Associates  
Lab No. 85P581  
PO No. C48908 Rider 1  
Page -2-

APPENDIX A

X = Longitudinal Direction

<u>Sample</u>	<u>1/2" Direction</u>	<u>1" Direction</u>
61	-	X
62	X	-
83	X	-
84	-	X
87	X	-
88	-	X
118	X	-
119	X	-
182	X	-
183	X	-
196	-	X
197	X	-
198	-	X
199	-	X
202	X	-
203	-	X

C. D. TROWBRIDGE, Director

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*Chemical, Metallurgical, Physical, Non-Destructive, Spectrographic,  
Agricultural Testing and Analyses*

*Investigations, Research and Development, Inspection, Field Services*



ST. LOUIS TEST

March 7, 1985  
Report No. 85-1337  
Lab No. 85P581  
PO No. C48908 Rider #1

BALDWIN ASSOCIATES  
PO Box 306  
Clinton, Il. 61727

Attention: Manager of Quality Assurance

## REPORT OF ANALYSIS


MATERIAL: Carbon steel samples as listed on Data sheets

SUBJECT: Tensile tests per ASTM A-370 (Longitudinal or Transverse)

### RESULTS:

The attached Data sheets are for Baldwin samples on PO #C48908, Rider #1. Testing was performed in accordance with St. Louis Testing Labs. Quality Assurance Program 1-9-80, Rev. 3, which was surveyed, qualified and audited by Baldwin Associates.

Respectfully submitted,

  
Richard F. Kemlage  
Physical Testing Dept.

Saint Louis  
Testing  
Laboratories, Inc.



2810 Clark Avenue  
St. Louis, Missouri 63103  
314/531-8080

Baldwin Associates  
Lab No. 85P581  
PO No. C48908 Rider 1  
Page -2-

Yield taken at .2% offset

Sample	Original Area	Reduced Area	Reduction In Area %	Yield PSI	Tensile PSI	Elongation in 2" %	Plate Direction	Fracture
61	0.5741	0.1690	70.5	33757	49904	52.0	Transverse	Ductile
62	0.5745	0.2334	59.3	36971	55352	43.0	Transverse	Ductile
83	0.3847	0.1986	48.3	38913	55757	40.0	Transverse	Ductile
83	0.3843	0.1824	52.5	37626	55685	46.0	Longitudinal	Ductile
84	0.3815	0.1788	53.1	36723	55897	43.0	Transverse	Ductile
84	0.3830	0.1514	60.4	33681	54830	45.5	Longitudinal	Ductile
87	0.5768	0.3610	37.4	26421	56085	38.0	Transverse	Ductile
87	0.5670	0.2582	54.4	27989	55820	43.5	Longitudinal	Ductile
88	0.5685	0.2725	52.0	26385	54881	42.5	Transverse	Ductile
88	0.5658	0.2430	57.0	29321	54789	44.0	Longitudinal	Ductile
118	1.1407	0.7334	35.7	34715	67239	33.5	Transverse	Ductile
119	1.1400	0.6515	42.8	34210	67105	40.0	Transverse	Ductile
182	0.7876	0.3326	57.7	40832	64182	46.0	Transverse	Ductile
183	0.7826	0.3383	56.7	42703	63378	45.0	Transverse	Ductile
196	0.7746	0.3266	57.8	42060	63581	45.0	Transverse	Ductile
197	0.7615	0.3007	60.5	38214	64215	44.0	Transverse	Ductile
198	0.8094	0.3101	61.6	38547	67642	45.0	Transverse	Ductile
199	0.8077	0.3830	52.5	33948	67042	43.5	Transverse	Ductile
202	0.7498	0.3560	52.5	38410	57882	38.5	Transverse	Ductile
203	0.7414	0.2254	69.5	33989	43802	56.5	Transverse	Ductile

Attachment 2

Heats Supplied as Full Size Sheets

Attachment 2

Heats Supplied as Full Size Sheets

<u>Tab Index No.</u>	<u>Mfg's Heat No.</u>
4	494L0731
8	B5915
8	411C1371
11	411N7321 (1)
11	490N1831 (1)
12	8201721 (1)
14	8226725 (1)
16	490S1431
17	402W8091 (1)
17	421W0001 (2)
17	421W1681 (1)
17	422W7811 (1)
17	422X4731 (1)
17	422X5051 (1)
17	9371221 (1)
17	9385521 (1)
17	9440021

- (1) This material was tested by St. Louis Testing Laboratories, Inc. The results are included in Attachment 1.
- (2) This heat was retested by St. Louis Testing Laboratories, Inc. The results are included in Appendix A of Attachment 1.