

To:



Re: Review of A36 Material Test Reports for Weldability

Introduction & Scope

PADEYE.com is offering weldable forged lifting eyes engineered and certified to meet all ASME BTH-1 categories and classes. Included in the product offerings are 1/2 ton up to 6 1/2 ton lifting pad eyes made of forged A36 steel. A total of twenty six (26) specimens were tested for chemistry, tensile and brinell hardness and the subsequent values were submitted for review. The inspection reports submitted for review are attached in Appendix A. The objective of the review is to determine the general weldability based on the chemical analyses of the forged A36 material being offered and does not assume responsibility for the application of this material for any specific purposes.

Documents Reviewed

PMI, tensile, and hardness results for the following specimens were reviewed:

- 1/2 Ton Pad Eye - ID A, B
- 1 1/2 Ton Pad Eye - ID A, B, C, D, E, F
- 1 Ton Pad Eye - ID A, B, C, D
- 2 Ton Pad Eye - ID A, B, C, D, E, F, G, H, I, J
- 4 3/4 Ton Pad Eye - ID A, B
- 6 1/2 Ton Pad Eye - ID A, B

Review Basis

- ASME BTH-1 Design Category A
- ASME BTH-1 Service Class 0
- Temperature Range 25°F to 150°F

Statement of Results

- All materials under this review meet ASTM A36 chemical analysis requirements
- All materials reviewed are highly weldable
- The range of IIW carbon equivalencies (CE) among the entire 26 sample set is 0.22% to 0.28%
- For applications requiring improved impact properties, a higher Mn content is recommended

Table. 1 - Table of Results

Item	Document	ID	CE (IIW)	Results / Comment
1	1/2 Ton Pad Eye	A	0.26	Meets ASTM A36 / Very Weldable
2		B	0.23	Meets ASTM A36 / Very Weldable
3	1 1/2 Ton Pad Eye	A	0.25	Meets ASTM A36 / Very Weldable
4		B	0.27	Meets ASTM A36 / Very Weldable
5		C	0.26	Meets ASTM A36 / Very Weldable
6		D	0.25	Meets ASTM A36 / Very Weldable
7		E	0.26	Meets ASTM A36 / Very Weldable
8		F	0.26	Meets ASTM A36 / Very Weldable
9	1 Ton Pad Eye	A	0.22	Meets ASTM A36 / Very Weldable
10		B	0.25	Meets ASTM A36 / Very Weldable
11		C	0.25	Meets ASTM A36 / Very Weldable
12		D	0.24	Meets ASTM A36 / Very Weldable
13	2 Ton Pad Eye	A	0.25	Meets ASTM A36 / Very Weldable
14		B	0.28	Meets ASTM A36 / Very Weldable
15		C	0.24	Meets ASTM A36 / Very Weldable
16		D	0.28	Meets ASTM A36 / Very Weldable
17		E	0.26	Meets ASTM A36 / Very Weldable
18		F	0.27	Meets ASTM A36 / Very Weldable
19		G	0.27	Meets ASTM A36 / Very Weldable
20		H	0.28	Meets ASTM A36 / Very Weldable
21		I	0.26	Meets ASTM A36 / Very Weldable
22		J	0.27	Meets ASTM A36 / Very Weldable
23	4 3/4 Ton Pad Eye	A	0.25	Meets ASTM A36 / Very Weldable
24		B	0.26	Meets ASTM A36 / Very Weldable
25	6 1/2 Ton Pad Eye	A	0.26	Meets ASTM A36 / Very Weldable
26		B	0.26	Meets ASTM A36 / Very Weldable

Sincerely,

Mark R. Devall, P.E., AWS CWEng

President

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APPENDIX A
Material Inspection Reports



101 OLD UNDERWOOD RD. BLDG.J
LAPORTE, TEXAS, USA 77571
PHONE (281) 228-0000 FAX (281) 228-0009

PO: RM731-888
CUSTOMER: ROMAR MEC
STREET: 218 WEST RICHEY ROAD
CITY/ ST/ ZIP: HOUSTON, TEXAS 77090
TECHNICIAN: ELLIS HARGRAVES API 578
DATE: 3/18/2016

JOB: HB009-999
EQUIPMENT: GE ULTRA 91299/SPECTRO
SERIAL NO: XRAY FLUORESCENCE/OPTICAL EMISSIONS
PROCEDURE: PMI-1 R6/PMI-2 R0
PART/PALLET: PAD EYE 031615
DETECTOR CAL: (X) YES () NO

DESCRIPTION	ID	REQUIRED	PMI	TENSILE	BHN	C	MN	P	S	CU	SI	NI	CR	MO	NB	TI	AL	Accept Reject
1 1/2 Ton Pad Eye	A	A36	A36	65K	133	0.16	0.44	0.030	0.020	0.13	0.15	0.05	0.04	0.00	0.01	0.00		Accept
1 1/2 Ton Pad Eye	B	A36	A36	64K	131	0.18	0.42	0.031	0.019	0.11	0.13	0.07	0.02	0.01	0.02	0.01		Accept
1 1/2 Ton Pad Eye	C	A36	A36	64K	130	0.17	0.44	0.029	0.017	0.13	0.19	0.07	0.01	0.01	0.02	0.00		Accept
1 1/2 Ton Pad Eye	D	A36	A36	66K	136	0.16	0.42	0.029	0.021	0.09	0.20	0.05	0.03	0.00	0.00	0.02		Accept
1 1/2 Ton Pad Eye	E	A36	A36	65K	134	0.17	0.46	0.027	0.018	0.10	0.19	0.05	0.03	0.01	0.01	0.00		Accept
1 1/2 Ton Pad Eye	F	A36	A36	65K	133	0.17	0.42	0.026	0.021	0.11	0.18	0.05	0.02	0.01	0.02	0.00		Accept
Standard			A36	A36	213b	0.15	0.78			0.28		0.15	0.14	0.04	0.00	0.00		
Test						0.16	0.76			0.29		0.13	0.11	0.04	0.00	0.00		



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CITY/ ST/ ZIP: HOUSTON, TEXAS 77090

TECHNICIAN: ELLIS HARGRAVES API 578

DATE: 3/18/2016

JOB: HB009-999

EQUIPMENT: GE ULTRA 91299/SPECTRO

SERIAL NO: XRAY FLUORESCENCE/OPTICAL EMISSIONS

PROCEDURE: PMI-1 R6/PMI-2 R0

PART/PALLET: **PAD EYE 031614**

DETECTOR CAL: (X) YES () NO

DESCRIPTION	ID	REQUIRED	PMI	TENSILE	BHN	C	MN	P	S	CU	SI	NI	CR	MO	NB	TI	AL	Accept Reject	
1 Ton Pad Eye	A	A36	A36	62K	129	0.13	0.43	0.025	0.017	0.11	0.18	0.04	0.01	0.01	0.01	0.00		Accept	
1 Ton Pad Eye	B	A36	A36	64K	131	0.15	0.45	0.027	0.019	0.09	0.19	0.06	0.04	0.01	0.00	0.00		Accept	
1 Ton Pad Eye	C	A36	A36	65K	133	0.16	0.41	0.026	0.015	0.09	0.15	0.04	0.03	0.01	0.01	0.02		Accept	
1 Ton Pad Eye	D	A36	A36	62K	127	0.15	0.44	0.028	0.013	0.13	0.14	0.03	0.01	0.00	0.02	0.01		Accept	
Standard			A36	A36	213b	0.15	0.78			0.28		0.15	0.14	0.04	0.00	0.00			
Test						0.16	0.76			0.29		0.13	0.11	0.04	0.00	0.00			



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SERIAL NO: XRAY FLUORESCENCE/OPTICAL EMISSIONS
PROCEDURE: PMI-1 R6/PMI-2 R0
PART/PALLET: **PAD EYE 031616**
DETECTOR CAL: (X) YES () NO

DESCRIPTION	ID	REQUIRED	PMI	TENSILE	BHN	C	MN	P	S	CU	SI	NI	CR	MO	NB	TI	AL	Accept Reject
2 Ton Pad Eye	A	A36	A36	62K	128	0.16	0.42	0.022	0.011	0.11	0.13	0.04	0.03	0.00	0.01	0.01		Accept
2 Ton Pad Eye	B	A36	A36	65K	132	0.19	0.41	0.024	0.016	0.10	0.11	0.04	0.04	0.01	0.00	0.00		Accept
2 Ton Pad Eye	C	A36	A36	62K	128	0.15	0.43	0.031	0.010	0.10	0.17	0.05	0.02	0.00	0.01	0.00		Accept
2 Ton Pad Eye	D	A36	A36	61K	126	0.19	0.45	0.024	0.017	0.10	0.15	0.05	0.03	0.01	0.00	0.01		Accept
2 Ton Pad Eye	E	A36	A36	64K	131	0.17	0.42	0.021	0.017	0.10	0.16	0.04	0.02	0.01	0.00	0.00		Accept
2 Ton Pad Eye	F	A36	A36	64K	130	0.18	0.41	0.020	0.017	0.09	0.15	0.07	0.03	0.00	0.01	0.01		Accept
2 Ton Pad Eye	G	A36	A36	62K	129	0.18	0.44	0.028	0.013	0.12	0.12	0.05	0.02	0.01	0.01	0.00		Accept
2 Ton Pad Eye	H	A36	A36	66K	135	0.19	0.43	0.024	0.018	0.12	0.19	0.04	0.04	0.00	0.01	0.01		Accept
2 Ton Pad Eye	I	A36	A36	65K	132	0.17	0.43	0.025	0.019	0.12	0.19	0.04	0.04	0.00	0.02	0.02		Accept
2 Ton Pad Eye	J	A36	A36	62K	128	0.18	0.45	0.021	0.020	0.12	0.14	0.05	0.02	0.01	0.01	0.02		Accept
Standard			A36	A36	213b	0.15	0.78			0.28		0.15	0.14	0.04	0.00	0.00		
Test						0.16	0.76			0.29		0.13	0.11	0.04	0.00	0.00		



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DATE: 3/18/2016

JOB: HB009-999
EQUIPMENT: GE ULTRA 91299/SPECTRO
SERIAL NO: XRAY FLUORESCENCE/OPTICAL EMISSIONS
PROCEDURE: PMI-1 R6/PMI-2 R0
PART/PALLET: **PAD EYE 031617**
DETECTOR CAL: (X) YES () NO

DESCRIPTION	ID	REQUIRED	PMI	TENSILE	BHN	C	MN	P	S	CU	SI	NI	CR	MO	NB	TI	AL	Accept Reject
4 3/4 Ton Pad Eye	A	A36	A36	70K	144	0.15	0.46	0.030	0.017	0.10	0.14	0.06	0.04	0.00	0.00	0.02		Accept
4 3/4 Ton Pad Eye	B	A36	A36	72K	147	0.17	0.43	0.024	0.020	0.12	0.16	0.05	0.03	0.01	0.01	0.01		Accept
Standard			A36	A36	213b	0.15	0.78			0.28		0.15	0.14	0.04	0.00	0.00		
Test						0.16	0.76			0.29		0.13	0.11	0.04	0.00	0.00		



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DATE: 3/18/2016

JOB: HB009-999
EQUIPMENT: GE ULTRA 91299/SPECTRO
SERIAL NO: XRAY FLUORESCENCE/OPTICAL EMISSIONS
PROCEDURE: PMI-1 R6/PMI-2 R0
PART/PALLET: PAD EYE 031618
DETECTOR CAL: (X) YES () NO

DESCRIPTION	ID	REQUIRED	PMI	TENSILE	BHN	C	MN	P	S	CU	SI	NI	CR	MO	NB	TI	AL	Accept Reject	
6 1/2 Ton Pad Eye	A	A36	A36	64K	131	0.17	0.42	0.017	0.013	0.11	0.22	0.07	0.03	0.00	0.02	0.01		Accept	
6 1/2 Ton Pad Eye	B	A36	A36	67K	138	0.18	0.42	0.019	0.015	0.09	0.20	0.04	0.01	0.00	0.01	0.01		Accept	
Standard			A36	A36	213b	0.15	0.78			0.28		0.15	0.14	0.04	0.00	0.00			
Test						0.16	0.76			0.29		0.13	0.11	0.04	0.00	0.00			