

Contract No.	
Customer	DUFERCO
U/C No.	
P/O No.	32201411C311
Commodity	H-BEAM
Specification	ASTM A572 G50/A992/ CSA 350W

MILL TEST CERTIFICATE



Head Office	63, Jungbong-daero, Dong-gu, Incheon, 401-712, S. Korea
Certificate No.	IH20141103209 - 1
Class Cert. No.	
Date of issue	2014-11-17



Dimensions & Length	Heat No.	Pieces Weights (kg)	Chemical Composition (%)											Tensile Test			Impact Test (V-notch)				Remarks (Impact Specimen Size)		
			C	Si	Mn	P	S	Cu	Mo	Al	Nb	Sn	CE ⁽¹⁾	Tensile Strength	Yield point	Elongation ⁽²⁾	Yield Ratio	AVG	1	2		3	
			×100			×1000		×100		×1000			×100	N/mm ²		%		C					
10X8X33 40.00 FT	D 123432	6 3,594	18	17	59	22	7	25	2	7	1	17	15	34	523	398	24.0	0.76					
10X8X33 40.00 FT	D 123433	12 7,188	16	16	59	23	6	33	2	6	1	16	13	33	520	400	24.5	0.77					
10X8X33 40.00 FT	D 123434	54 32,346	18	17	60	25	6	30	2	5	1	15	12	35	525	405	24.0	0.77					
10X8X33 40.00 FT	D 123435	108 64,692	17	18	59	26	6	31	2	7	1	17	14	33	528	407	24.5	0.77					
10X8X39 40.00 FT	D 123430	24 16,992	18	14	64	23	5	31	3	6	2	19	13	35	511	376	27.0	0.74					
12X6-1/2X26 40.00 FT	D 123338	9 4,248	16	16	60	27	4	21	2	4	1	17	10	31	514	405	25.0	0.79					
12X6-1/2X26 40.00 FT	D 123339	96 45,312	16	16	59	17	5	26	2	4	1	17	11	31	518	405	25.0	0.78					
12X6-1/2X26 40.00 FT	D 123340	88 41,536	16	14	59	21	5	24	3	9	1	18	12	32	502	399	26.0	0.80					
12X6-1/2X26 40.00 FT	D 123341	72 33,984	16	15	59	16	4	26	2	5	1	17	13	31	523	410	24.0	0.78					
SUB TOTAL		469 249,892																					

(Note) (1) Ceq: (CE=C+Mn/6+Cr/5+V/5+Mo/5+Ni/15+Cu/15) (2) Gauge length : 200 mm (3) Yield Ratio = YP/TS

J. C. Ahn

General Manager of Q.A Team

WE HEREBY CERTIFY THAT THE MATERIAL HAS BEEN MADE AND TESTED IN ACCORDANCE WITH THE ABOVE SPECIFICATION AND ALSO WITH THE REQUIREMENTS CALLED FOR THE ABOVE ORDER

HMS I 102(A)-3a ※ QR마크 (Qreal App)를 통하여 원본 확인에 사용되는 미크로칩입니다. (QRcode scanner App : Qreal)

A4(210x297)

Contract No.	
Customer	DUFERCO
L/C No.	
P/O No.	32201411C311
Commodity	H-BEAM
Specification	ASTM A572 G50/A992/ CSA 350W

MILL TEST CERTIFICATE



Head Office	63, Jungbong-daero, Dong-gu, Incheon, 401-712, S. Korea
Certificate No.	IH20141103209 - 2
Class Cert. No.	
Date of Issue	2014-11-17



Dimensions & Length	Heat No.	Pieces Weights (kg)	Chemical Composition (%)											Tensile Test			Yield Ratio	Impact Test (V-notch)				Remarks (Impact Specimen Size)
			C	Si	Mn	P	S	Cu	Mo	Al	Nb	Sn	CE ⁽¹⁾	Tensile Strength	Yield point	Elongation ⁽²⁾		AVG	1	2	3	
			×100		×1000		×100		×1000		×100		N/mm ²	%	()	C						
12X6-1/2X26 40.00 FT	D 123342	64 30,208	18	19	70	21	5	22	2	5	20	13	35	550	427	24.0	0.78					
12X6-1/2X26 40.00 FT	D 123343	16 7,552	18	16	71	25	8	27	2	5	20	13	35	540	422	24.0	0.78					
12X6-1/2X30 40.00 FT	D 121670	6 3,264	16	14	80	21	2	26	1	5	16	11	30	517	380	25.0	0.74					
12X6-1/2X30 40.00 FT	D 123334	183 99,552	16	15	58	25	5	20	2	4	17	10	31	508	375	25.5	0.74					
12X6-1/2X30 40.00 FT	D 123335	95 52,224	17	16	59	24	6	23	2	4	15	14	32	499	382	24.5	0.77					
12X6-1/2X30 40.00 FT	D 123336	17 9,248	16	15	58	31	5	22	2	5	15	12	31	508	377	26.0	0.74					
18X7-1/2X50 40.00 FT	E 177710	12 10,884	17	19	64	24	6	27	2	5	17	5	15	521	398	26.0	0.76					
18X7-1/2X50 40.00 FT	E 177711	65 58,955	18	16	62	20	6	26	2	4	3	11	34	532	411	26.0	0.77					
18X7-1/2X50 40.00 FT	E 177712	43 39,001	20	19	65	25	6	28	2	6	5	17	36	524	409	26.0	0.78					
SUB TOTAL		502 310,888																				

(Note) (1) Ceq: (CE=C+Mn/6+Cr/5+V/5+Mo/5+Ni/15+Cu/15) (2) Gauge length : 200 mm (3) Yield Ratio = YP/TS

J. C. Ahn
General Manager of Q.A Team

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Commodity	H-BEAM
Specification	ASTM A572 G60/A992/ CSA 350W

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Head Office	63, Jungbong-daero, Dong-gu, Incheon, 401-712, S. Korea
Certificate No.	IH20141103209 - 3
Class Cert. No.	
Date of Issue	2014-11-17

Dimensions & Length	Heat No.	Pieces Weights (kg)	Chemical Composition (%)													Tensile Test			Impact Test (V-notch)				Remarks (Impact Specimen Size)			
			C	Si	Mn	P	S	Cu	Mo	Al	Nb	Sn	CE ⁽¹⁾	Tensile Strength	Yield point	Elongation ⁽²⁾	Yield Ratio	AVG	1	2	3					
			×100			×1000			×100			×1000				N/mm ²		%		C						
12X10X53 40.00 FT	E 177739	25 24,025	19	12	62	25	12	29	2	3	8	9	17	4	12	34	547	428	25.0	0.78						
12X10X53 40.00 FT	E 177740	8 7,688	18	16	65	26	8	32	2	4	8	8	16	5	13	34	535	414	25.5	0.77						
12X10X53 40.00 FT	E 177741	9 8,649	17	15	65	22	10	24	2	5	6	8	15	5	10	32	529	409	26.0	0.77						
12X10X53 40.00 FT	E 177742	14 13,454	17	16	66	24	10	27	2	4	7	11	16	5	12	33	535	420	25.5	0.78						
12X10X53 40.00 FT	E 177743	8 7,688	17	17	64	21	9	25	2	6	7	9	17	6	11	32	529	417	26.0	0.79						
12X10X53 40.00 FT	E 177744	3 2,883	17	16	63	24	8	26	2	4	9	10	16	4	11	33	522	407	25.5	0.78						
12X10X53 40.00 FT	E 177745	1 961	17	13	62	24	9	26	2	4	10	9	16	5	12	32	537	412	26.0	0.77						
12X10X58 40.00 FT	E 177755	12 12,624	18	16	64	27	9	31	2	5	9	12	17	6	15	34	549	412	26.0	0.75						
12X10X58 40.00 FT	E 177756	16 16,832	18	14	67	26	8	27	2	4	8	15	18	6	12	35	548	410	26.0	0.75						
12X10X58 40.00 FT	E 177756	16 16,832	18	14	67	26	8	27	2	4	8	15	18	6	12	35	548	410	26.0	0.75						
SUB TOTAL		96 94,804																								

(Note) (1) Ceq: (CE=C+Mn/6+Cr/5+V/5+Mo/5+Ni/15+Cu/15) (2) Gauge length : 200 mm (3) Yield Ratio = YP/TS

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General Manager of Q.A Team

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Certificate No.	IH20141103209 - 4
Class Cert. No.	
Date of Issue	2014-11-17

Dimensions & Length	Heat No.	Pieces Weights (kg)	Chemical Composition (%)													Tensile Test				Impact Test (V-notch)				Remarks (Impact Specimen Size)
			C	Si	Mn	P	S	Cu	Mo	Al	Nb	Sn	CE ⁽¹⁾	Tensile Strength	Yield point	Elongation ⁽²⁾	Yield Ratio	AVG	1	2	3			
			x100	x1000	x100	x1000	x100	x100	x1000	x1000	x100	x100	x100	N/mm ²	%	%	()	C	C	C	C			
12X10X58 40.00 FT	E 177757	16 16,832	19	17	64	26	7	25	2	5	6	12	35	542	417	24.0	0.77							
12X10X58 40.00 FT	E 177759	9 9,468	18	16	62	22	9	26	2	6	7	22	33	533	410	24.5	0.77							
12X10X58 40.00 FT	E 177760	7 7,364	18	19	65	35	10	30	2	7	7	22	35	526	394	26.0	0.75							
12X12X79 40.00 FT	E 177882	7 10,038	16	14	56	29	6	24	3	5	5	10	31	512	396	26.5	0.77							
12X12X79 40.00 FT	E 177883	38 54,492	15	15	52	23	7	21	2	3	4	10	20	504	390	26.0	0.77							
14X6-3/4X30 40.00 FT	D 123092	260 141,440	18	17	62	29	10	27	3	6	19	14	35	528	402	24.0	0.76							
14X6-3/4X30 40.00 FT	D 123101	10 5,440	18	14	60	18	4	31	3	5	16	14	34	518	399	25.5	0.77							
14X6-3/4X30 40.00 FT	D 123496	30 16,320	20	16	59	29	4	32	3	5	17	15	36	535	400	22.5	0.75							
14X8X43 40.00 FT	E 176874	12 9,360	18	15	65	22	10	26	2	4	4	16	34	538	411	24.0	0.76							
SUB TOTAL		389 270,754																						

(Note) (1) Ceq: (CE=C+Mn/6+Cr/5+V/5+Mo/5+Ni/15+Cu/15) (2) Gauge length : 200 mm (3) Yield Ratio = YP/TS

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General Manager of Q.A Team

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HMS 1102(A)-3a

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A4(210x297)

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MILL TEST CERTIFICATE



Head Office	63, Jungbong-daero, Dong-gu, Incheon, 401-712, S. Korea
Certificate No.	HH20141103209 - 6
Class Cert. No.	
Date of Issue	2014-11-17



Dimensions & Length	Heat No.	Pieces Weights (kg)	Chemical Composition (%)											Tensile Test			Impact Test (V-notch)				Remarks (Impact Specimen Size)		
			C	Si	Mn	P	S	Cu	Mo	Al	Nb	Sn	CE ⁽¹⁾	Tensile Strength	Yield point	Elongation ⁽²⁾	Yield Ratio	AVG	1	2		3	
			x100		x1000		x100		x1000		x100		x100		N/mm ²		%		C				
14X8X43 40.00 FT	E 177677	7 5,460	17	18	66	31	10	23	2	4	15	4	11	34	517	422	24.5	0.82					
14X8X43 40.00 FT	E 177681	7 5,460	17	17	63	24	8	27	2	4	11	5	12	33	500	398	27.0	0.80					
14X8X43 40.00 FT	E 177770	12 9,360	18	16	66	21	8	21	2	4	11	4	12	34	497	392	26.5	0.79					
14X8X43 40.00 FT	E 177789	43 37,440	16	15	63	20	10	29	2	3	8	4	13	31	514	409	24.5	0.80					
14X8X43 40.00 FT	E 177789	59 46,020	17	13	67	21	10	27	2	3	11	10	17	33	522	392	26.0	0.75					
14X8X48 40.00 FT	E 177767	86 74,906	17	16	66	19	10	23	3	3	10	9	18	33	532	406	25.0	0.76					
14X8X48 40.00 FT	E 177768	38 33,098	18	15	69	21	7	22	2	4	8	8	16	34	534	408	24.0	0.76					
14X8X53 40.00 FT	E 177761	14 13,454	18	15	63	26	7	25	2	5	8	14	16	34	545	409	24.0	0.75					
14X8X53 40.00 FT	E 177762	6 5,766	17	15	63	18	8	25	2	4	8	12	16	33	547	410	24.5	0.75					
SUB TOTAL		277 230,964																					

(Note) (1) Ceq: (CE=C+Mn/6+Cr/5+V/5+Mo/5+Ni/15+Cu/15) (2) Gauge length : 200 mm (3) Yield Ratio = YP/TS

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General Manager of Q.A Team

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Specification	ASTM A572 G50/A992/ CSA 350W

MILL TEST CERTIFICATE



Head Office	63, Jungbong-daero, Dong-gu, Incheon, 401-712, S. Korea
Certificate No.	IH20141103209 - 7
Class Cert. No.	
Date of Issue	2014-11-17

Dimensions & Length	Heat No.	Pieces Weights (kg)	Chemical Composition (%)													Tensile Test				Impact Test (V-notch)				Remarks (Impact Specimen Size)	
			C	Si	Mn	P	S	Cu	Mo	Al	Nb	Sn	CE ⁽¹⁾	Tensile Strength	Yield point	Elongation ⁽²⁾	Yield Ratio	AVG	1	2	3				
			x100			x1000			x100			x1000			x100	N/mm ²		%	C						
14X8X53 40.00 FT	E 177763	48 46.128	17	14	66	17	10	27	2	4						525	380	24.0	0.72						
14X10X61 40.00 FT	E 178129	4 4.428	15	13	54	25	8	27	2	4					523	382	23.5	0.72							
14X10X61 40.00 FT	E 178130	3 3.321	15	12	50	29	6	31	3	5					509	393	26.0	0.77							
14X10X61 40.00 FT	E 178131	1 1.107	16	14	52	17	9	26	3	5					538	436	22.5	0.81							
14X10X61 40.00 FT	E 178133	8 8.856	16	13	55	30	10	26	2	4					524	419	23.5	0.80							
14X10X61 40.00 FT	E 178134	7 7.749	16	14	52	29	11	28	2	4					515	397	27.0	0.77							
14X10X61 40.00 FT	E 178135	9 5.535	16	14	52	28	7	26	2	5					512	397	26.5	0.78							
16X5-1/2X26 40.00 FT	D 123117	3 1.416	17	16	59	30	9	27	3	6					520	397	26.5	0.76							
16X5-1/2X26 40.00 FT	D 123123	3 1.416	17	16	60	29	8	30	2	5					510	392	26.0	0.76							
SUB TOTAL		82 79.956																							

(Note) (1) Ceq: (CE=C+Mn/6+Cr/5+V/5+Mo/5+Ni/15+Cu/15) (2) Gauge length : 200 mm (3) Yield Ratio = YP/TS

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MILL TEST CERTIFICATE



Head Office	63, Jungbong-daero, Dong-gu, Incheon, 401-712, S. Korea
Certificate No.	11120141103209 - 8
Class Cert. No.	
Date of Issue	2014-11-17

Dimensions & Length	Heat No.	Pieces Weights (kg)	Chemical Composition (%)											Tensile Test			Impact Test (V-notch)				Remarks (Impact Specimen Size)	
			C	Si	Mn	P	S	Cu	Mo	Al	Nb	Sn	CE ⁽¹⁾	Tensile Strength	Yield point	Elongation ⁽²⁾	Yield Ratio	AVG	1	2		3
			×100	×1000	×100	×1000	×100	×1000	×100	×1000	×100	×1000	×100	N/mm ²		%		()	C			
16X5-1/2X26 40.00 FT	D 123672	20 9,440	21	18	71	26	8	30	3	6	18	20	40	539	421	24.5	0.78					
16X5-1/2X26 40.00 FT	D 123673	50 42,480	17	14	61	25	7	28	2	5	16	13	33	544	425	23.5	0.78					
16X5-1/2X26 40.00 FT	D 123674	115 54,280	17	16	60	21	10	26	2	6	17	12	32	533	414	23.5	0.78					
16X5-1/2X31 40.00 FT	D 123676	120 67,440	16	16	60	22	7	30	2	5	17	13	32	512	407	25.5	0.80					
16X5-1/2X31 40.00 FT	D 123580	75 42,150	16	16	58	16	8	24	2	6	17	11	31	521	395	25.5	0.76					
16X7X36 40.00 FT	E 177682	6 3,918	18	16	65	22	9	24	2	4	5	12	34	550	430	25.5	0.78					
16X7X36 40.00 FT	E 177683	13 8,489	19	17	63	24	7	25	2	6	5	11	35	540	419	27.0	0.78					
16X7X36 40.00 FT	E 177684	62 40,486	18	17	63	26	10	25	2	5	4	12	34	544	426	26.0	0.78					
16X7X36 40.00 FT	E 177688	35 22,855	18	15	64	23	8	24	2	5	4	12	34	540	425	27.0	0.79					
SUB TOTAL		536 291,538																				

(Note) (1) Ceq: (CE=C+Mn/6+Cr/5+V/5+Mo/5+Ni/15+Cu/15) (2) Gauge length : 200 mm (3) Yield Ratio = YP/TS

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Dimensions & Length	Heat No.	Pieces Weights (kg)	Chemical Composition (%)											Tensile Test			Impact Test (V-notch)				Remarks (Impact Specimen Size)		
			C	Si	Mn	P	S	Cu	Mo	Al	Nb	Sn	CE ⁽¹⁾	Tensile Strength	Yield point	Elongation ⁽²⁾	Yield Ratio	AVG	1	2		3	
			×100		×1000		×100		×1000		×100		×100		N/mm ²		%	()	C				
16X7X36 40.00 FT	E 177689	5 3,265	17	17	64	24	9	25	2	4			13	33	538	424	27.5	0.79					
16X7X36 40.00 FT	E 177693	39 25,467	18	16	66	29	10	25	3	5			15	36	532	409	27.0	0.77					
16X7X50 40.00 FT	E 177641	13 11,791	17	15	61	20	8	22	2	5			11	32	539	434	25.5	0.80					
16X7X50 40.00 FT	E 177642	57 51,699	17	15	63	24	10	24	2	4			13	32	546	442	24.0	0.81					
16X7X50 40.00 FT	E 177643	40 36,280	17	15	63	26	8	24	2	4			13	32	552	442	24.0	0.91					
16X7X50 40.00 FT	E 177645	1 907	18	16	61	18	8	23	2	4			11	33	556	444	24.0	0.80					
16X7X50 40.00 FT	E 177646	3 2,721	17	18	62	19	4	24	2	4			11	32	552	442	24.5	0.80					
16X10-1/4X67 40.00 FT	E 178005	24 29,184	16	13	56	35	13	29	2	7			14	32	514	402	25.0	0.78					
16X10-1/4X67 40.00 FT	E 178006	12 14,592	17	14	51	21	7	25	2	7			11	30	512	400	26.0	0.78					
SUB TOTAL		194 175,906																					

(Note) (1) Ceq: (CE=C+Mn/6+Cr/5+V/5+Mo/5+Ni/15+Cu/15) (2) Gauge length : 200 mm (3) Yield Ratio = YP/TS

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Date of Issue	2014-11-17



Dimensions & Length	Heat No.	Pieces Weights (kg)	Chemical Composition (%)											Tensile Test			Yield Ratio	Impact Test (V-notch)				Remarks (Impact Specimen Size)
			C	Si	Mn	P	S	Cu	Mo	Al	Nb	Sn	CE ⁽¹⁾	Tensile Strength	Yield point	Elongation ⁽²⁾		AVG	1	2	3	
			x100		x1000		x100		x1000		x100		N/mm ²		%	C						
21X8-1/4X62 40.00 FT	E 177540	10 11,250	18	18	66	25	6	25	2	7	4	16	35	530	390	24.0	0.74					
21X8-1/4X62 40.00 FT	E 178431	37 41,625	18	12	51	23	12	22	2	5	4	10	33	510	390	26.0	0.76					
21X8-1/4X62 40.00 FT	E 178432	9 10,125	16	14	51	22	6	21	3	7	4	10	29	504	392	25.5	0.78					
21X8-1/4X93 40.00 FT	E 178419	13 21,931	17	14	51	32	8	27	2	5	3	12	31	498	388	29.0	0.78					
21X8-1/4X93 40.00 FT	E 178420	23 38,801	18	14	55	28	10	31	2	6	5	13	33	521	408	25.5	0.78					
21X6-1/2X44 40.00 FT	E 177860	4 3,192	17	10	54	25	11	31	2	3	4	12	31	525	435	23.0	0.83					
21X6-1/2X44 40.00 FT	E 177866	28 22,344	17	14	52	25	8	35	2	5	4	12	31	530	441	22.5	0.83					
21X6-1/2X44 40.00 FT	E 177867	63 50,274	16	15	55	24	8	33	2	5	4	12	31	535	428	25.0	0.80					
21X6-1/2X44 40.00 FT	E 177868	53 42,294	16	13	57	26	9	31	2	4	4	12	31	525	421	24.5	0.80					
SUB TOTAL		240 241,836																				

(Note) (1) Ceq: (CE=C+Mn/6+Cr/5+V/5+Mo/5+Ni/15+Cu/15) (2) Gauge length : 200 mm (3) Yield Ratio = YP/TS

J. C. Ahn
General Manager of Q.A Team

WE HEREBY CERTIFY THAT THE MATERIAL HAS BEEN MADE AND TESTED IN ACCORDANCE WITH THE ABOVE SPECIFICATION AND ALSO WITH THE REQUIREMENTS CALLED FOR THE ABOVE ORDER

Contract No.	
Customer	DUFERCO
L/C No.	
P/O No.	32201411C311
Commodity	H-BEAM
Specification	ASTM A572 (550/A992) CSA 350W

MILL TEST CERTIFICATE



Head Office	63, Jungbong-daero, Dong-gu, Incheon, 401-712, S. Korea
Certificate No.	1120141103209 - 11
Class Cert. No.	
Date of Issue	2014-11-17

Dimensions & Length	Heat No.	Pieces Weights (kg)	Chemical Composition (%)											Tensile Test			Impact Test (V-notch)				Remarks (Impact Specimen Size)	
			C	Si	Mn	P	S	Cu	Mo	Al	Nb	Sn	CE ⁽¹⁾	Tensile Strength	Yield point	Elongation ⁽²⁾	Yield Ratio	AVG	1	2		3
			x100		x1000		x100		x1000		x100		N/mm ²		%	C						
21X6-1/2X44 40.00 FT	E 177869	36 28,728	15	14	55	23	8	31	2	4	4	12	30	526	425	25.0	0.81					
21X6-1/2X44 40.00 FT	E 177872	8 6,384	17	18	61	29	6	29	2	5	6	14	33	525	412	25.5	0.79					
21X6-1/2X44 40.00 FT	E 177873	16 12,768	17	16	53	28	6	27	2	5	4	11	31	527	411	26.0	0.78					
21X6-1/2X44 40.00 FT	E 177874	3 2,394	18	14	51	19	7	28	2	4	4	12	31	521	415	26.0	0.80					
21X6-1/2X44 40.00 FT	E 177875	1 798	18	16	54	22	7	29	2	4	5	11	32	548	440	22.0	0.80					
21X6-1/2X44 40.00 FT	E 177880	1 798	15	13	51	26	6	29	2	6	6	13	29	518	405	27.5	0.78					
21X6-1/2X44 40.00 FT	E 178335	49 39,102	15	13	53	27	10	27	2	4	3	13	28	522	407	27.0	0.78					
21X6-1/2X44 40.00 FT	E 178336	34 27,132	15	13	54	28	10	32	2	4	4	12	30	527	410	24.0	0.78					
21X6-1/2X44 40.00 FT	E 178371	27 21,546	16	18	54	18	8	23	2	7	7	11	29	524	407	24.5	0.78					
SUB TOTAL		175 139,650																				

(Note) (1) Ceq: (CE=C+Mn/6+Cr/5+V/5+Mo/5+Ni/15+Cu/15) (2) Gauge length : 200 mm (3) Yield Ratio = YP/TS

J. C. Ahn
General Manager of Q.A Team

WE HEREBY CERTIFY THAT THE MATERIAL HAS BEEN MADE AND TESTED IN ACCORDANCE WITH THE ABOVE SPECIFICATION AND ALSO WITH THE REQUIREMENTS CALLED FOR THE ABOVE ORDER

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A4(210x297)

Contract No.	
Customer	DUFERCO
L/C No.	
P/O No.	32201411C311
Commodity	H-BEAM
Specification	ASTM A572 G50/A992/ CSA 350W

MILL TEST CERTIFICATE



Head Office	63, Jungbong-daero, Dong-gu, Incheon, 401-712, S. Korea
Certificate No.	IH20141103209 - 12
Class Cert. No.	
Date of Issue	2014-11-17

Dimensions & Length	Heat No.	Pieces Weights (kg)	Chemical Composition (%)											Tensile Test			Impact Test (V-notch)				Remarks (Impact Specimen Size)	
			C	Si	Mn	P	S	Cu	Mo	Al	Nb	Sn	CE ⁽¹⁾	Tensile Strength	Yield point	Elongation ⁽²⁾	Yield Ratio	AVG	1	2		3
			x100		x1000		x100		x1000		x100		x100		N/mm ²		%		C			
21X6-1/2X44 40.00 FT	E 178373	2 1,596	17	14	51	16	9	27	2	5	6	12	30	538	421	23.5	0.78					
21X6-1/2X44 40.00 FT	E 178375	20 15,960	15	13	50	18	8	24	2	5	4	10	28	541	427	23.0	0.79					
21X6-1/2X50 40.00 FT	E 177812	4 3,628	16	15	60	19	15	28	2	4	5	16	31	530	448	21.0	0.84					
21X6-1/2X50 40.00 FT	E 177854	28 25,396	17	15	54	26	9	31	2	6	6	13	31	527	438	23.0	0.83					
21X6-1/2X50 40.00 FT	E 177855	22 19,254	16	13	57	26	9	31	2	5	6	13	31	532	443	22.5	0.83					
21X6-1/2X50 40.00 FT	E 177856	10 9,070	16	13	53	26	12	31	2	5	6	13	30	535	445	23.0	0.83					
21X6-1/2X50 40.00 FT	E 177860	8 7,256	17	10	54	25	11	31	2	3	4	12	31	534	446	23.0	0.84					
21X6-1/2X57 40.00 FT	E 177795	21 21,714	16	13	51	16	7	30	2	4	3	11	30	518	403	24.0	0.78					
21X6-1/2X57 40.00 FT	E 177807	17 17,578	16	12	56	21	10	28	2	4	5	12	30	520	421	23.5	0.81					
SUB TOTAL		132 122,152																				

(Note) (1) Ceq: (CE=C+Mn/6+Cr/5+V/5+Mo/5+Ni/15+Cu/15) (2) Gauge length : 200 mm (3) Yield Ratio = YP/TS

J. C. Ahn
General Manager of Q.A Team

WE HEREBY CERTIFY THAT THE MATERIAL HAS BEEN MADE AND TESTED IN ACCORDANCE WITH THE ABOVE SPECIFICATION AND ALSO WITH THE REQUIREMENTS CALLED FOR THE ABOVE ORDER

HMS 1102(A)-3a * QR마크: 'Qreal' App를 통하여 원본 확인에 사용되는 마크입니다. (QRcode scanner App : 'Qreal') A4(210x297)

Contract No.	
Customer	DUFERCO
L/C No.	
P/O No.	32201411C311
Commodity	H-BEAM
Specification	ASTM A572 G50/A992/ CSA 350W

MILL TEST CERTIFICATE



Head Office	63, Jungbong-daero, Dong-gu, Incheon, 401-712, S. Korea
Certificate No.	IH20141103209 - 13
Class Cert. No.	
Date of Issue	2014-11-17

Dimensions & Length	Heat No.	Pieces Weights (kg)	Chemical Composition (%)											Tensile Test			Impact Test (V-notch)				Remarks (Impact Specimen Size)				
			C	Si	Mn	P	S	Cu	Mo	Al	Nb	Sn	CE ⁽¹⁾	Tensile Strength	Yield point	Elongation ⁽²⁾	Yield Ratio	AVG	1	2		3			
			x100		x1000		x100		x1000		x100		x100		N/mm ²		%		C						
21X6-1/2X57 40.00 FT	E 177808	18 18,612	16	13	58	18	5	24	3	5	8	13	4	12	30	516	404	25.0	0.78						
21X6-1/2X57 40.00 FT	E 177809	4 4,136	17	14	51	21	10	27	3	5	9	8	13	4	12	30	504	392	25.0	0.78					
21X12-1/4X101 40.00 FT	N 025947	12 21,984	18	17	65	23	12	23	3	5	10	14	17	6	11	35	531	375	25.0	0.71					
24X9X68 40.00 FT	N 025796	15 18,510	18	20	67	18	8	19	2	4	7	8	27	4	10	33	543	442	24.0	0.81					
24X9X68 40.00 FT	N 025799	3 3,702	18	18	65	33	7	19	2	5	7	21	25	5	10	36	580	446	23.0	0.80					
24X9X68 40.00 FT	N 025804	6 7,404	18	15	64	21	10	24	2	4	8	13	26	4	12	34	557	446	23.0	0.80					
24X9X68 40.00 FT	N 025810	11 13,574	19	15	66	23	12	22	2	4	7	12	28	5	12	35	548	423	25.0	0.77					
24X9X68 40.00 FT	N 025811	1 1,234	19	17	69	23	11	28	2	5	8	12	27	5	15	36	541	410	25.0	0.76					
24X9X68 40.00 FT	N 026378	12 14,808	20	14	66	24	11	25	2	5	8	12	15	3	15	36	522	388	27.5	0.74					
SUB TOTAL		82 103,964																							



(Note) (1) Ceq: (CE=C+Mn/6+Cr/5+V/5+Mo/5+Ni/15+Cu/15) (2) Gauge length : 200 mm (3) Yield Ratio = YP/TS

J. C. Ahn
General Manager of Q.A Team

WE HEREBY CERTIFY THAT THE MATERIAL HAS BEEN MADE AND TESTED IN ACCORDANCE WITH THE ABOVE SPECIFICATION AND ALSO WITH THE REQUIREMENTS CALLED FOR THE ABOVE ORDER

Contract No.	
Customer	DUFERCO
L/C No.	
P/O No.	32201411C311
Commodity	H-BEAM
Specification	ASTM A572 G50/A992/ CSA 350W

MILL TEST CERTIFICATE

		
Head Office	63, Jungbong-daero, Dong-gu, Incheon, 401-712, S. Korea	
Certificate No.	IH20141103208 - 14	
Class Cert. No.		
Date of Issue	2014-11-17	

Dimensions & Length	Heat No.	Pieces Weights (kg)	Chemical Composition (%)													Tensile Test			Impact Test (V-notch)				Remarks (Impact Specimen Size)
			C	Si	Mn	P	S	Cu	Mo	Al	Nb	Sn	CE ⁽¹⁾	Tensile Strength	Yield point	Elongation ⁽²⁾	Yield Ratio	AVG	1	2	3		
			×100			×1000			×100			×1000			×100		N/mm ²	%	%	()	C		
24X9X68 40.00 FT	N 026379	42 51,828	18	14	66	31	11	35	2	4	15	2	17	35	532	394	27.0	0.74					
24X9X68 40.00 FT	N 026380	52 64,166	18	14	70	28	10	28	2	4	15	2	13	35	525	384	26.0	0.73					
24X9X68 40.00 FT	N 026381	10 12,340	19	14	69	24	9	26	2	4	16	2	12	36	516	380	27.5	0.74					
24X9X68 40.00 FT	N 026382	1 1,234	18	15	65	27	6	24	2	5	15	2	10	34	509	372	27.5	0.73					
24X9X68 40.00 FT	N 026387	14 1,234	18	14	65	27	9	29	2	4	14	3	16	35	521	385	27.5	0.74					
24X9X68 40.00 FT	N 026388	17 20,978	18	14	67	28	10	28	2	3	14	2	13	35	525	383	27.0	0.73					
24X9X68 40.00 FT	N 026389	43 53,062	18	16	65	31	7	25	1	5	14	4	12	33	502	365	28.5	0.73					
24X9X68 40.00 FT	N 026390	8 9,872	19	20	66	29	7	26	2	5	14	2	13	36	510	369	27.0	0.72					
24X9X84 40.00 FT	N 025777	21 32,004	19	18	65	28	8	22	2	7	16	4	11	36	552	446	25.0	0.79					
SUB TOTAL		195 246,720																					

(Note) (1) Ceq: (CE=C+Mn/6+Cr/5+V/5+Mo/5+Ni/15+Cu/15) (2) Gauge length : 200 mm (3) Yield Ratio = YP/TS

<p style="font-size: 24px; font-weight: bold;">J. C. Ahn</p> <p>General Manager of Q.A Team</p>	<p>WE HEREBY CERTIFY THAT THE MATERIAL HAS BEEN MADE AND TESTED IN ACCORDANCE WITH THE ABOVE SPECIFICATION AND ALSO WITH THE REQUIREMENTS CALLED FOR THE ABOVE ORDER</p>	
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A4(210×297)

Contract No.	
Customer	DUFERCO
L/C No.	
P/O No.	32201411C311
Commodity	H-BEAM
Specification	ASTM A572 G50/A992/ CSA 350W

MILL TEST CERTIFICATE



Head Office	63, Jungbong-daero, Dong-gu, Incheon, 401-712, S. Korea
Certificate No.	HH20141103209 - 15
Class Cert. No.	
Date of Issue	2014-11-17

Dimensions & Length	Heat No.	Pieces Weights (kg)	Chemical Composition (%)											Tensile Test			Impact Test (V-notch)				Remarks (Impact Specimen Size)			
			C	Si	Mn	P	S	Cu	Mo	Al	Nb	Sn	CE ⁽¹⁾	Tensile Strength	Yield point	Elongation ⁽²⁾	Yield Ratio	AVG	1	2		3		
			×100		×1000		×100		×1000			×100		N/mm ²		%		C						
24X9X84 40.00 FT	N 025778	20 30,480	18	19	64	27	10	21	2	9			4	11	34	564	448	24.0	0.79					
24X9X84 40.00 FT	N 025779	19 28,956	18	18	66	26	8	20	2	7			4	10	34	567	448	22.5	0.79					
24X9X84 40.00 FT	N 025780	1 1,524	19	15	68	27	11	20	3	6			5	11	37	563	446	24.5	0.79					
24X9X84 40.00 FT	N 025781	2 3,048	20	16	66	28	11	21	2	7			6	12	37	565	447	24.0	0.79					
24X9X94 40.00 FT	N 025771	19 32,414	19	16	65	25	13	18	2	5			5	9	35	542	427	25.0	0.79					
24X9X94 40.00 FT	N 025772	15 25,590	19	20	64	24	11	18	2	6			5	9	34	555	440	25.0	0.79					
24X9X94 40.00 FT	N 025773	10 17,060	18	20	66	27	10	22	2	7			4	10	35	552	439	25.0	0.80					
24X9X94 40.00 FT	N 025774	12 20,472	20	15	66	30	12	22	2	7			4	11	37	569	446	24.5	0.78					
24X9X94 40.00 FT	N 025775	1 1,706	20	16	66	31	10	21	2	7			4	10	38	570	447	24.0	0.78					
SUB TOTAL		99 161,250																						

(Note) (1) Ceq: (CE=C+Mn/6+Cr/5+V/5+Mo/5+Ni/15+Cu/15) (2) Gauge length : 200 mm (3) Yield Ratio = YP/TS

J. C. Ahn
General Manager of Q.A Team

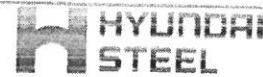
WE HEREBY CERTIFY THAT THE MATERIAL HAS BEEN MADE AND TESTED IN ACCORDANCE WITH THE ABOVE SPECIFICATION AND ALSO WITH THE REQUIREMENTS CALLED FOR THE ABOVE ORDER

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A4(210x297)

Contract No.	
Customer	DUFERCO
L/C No.	
P/O No.	32201411C311
Commodity	H-BEAM
Specification	ASTM A572 G50/A992/ CSA 350W

MILL TEST CERTIFICATE



Head Office	63, Jungbong-daero, Dong-gu, Incheon, 401-712, S. Korea
Certificate No.	1120141103209 - 16
Class Cert. No.	
Date of Issue	2014-11-17



Dimensions & Length	Heat No.	Pieces	Weights (kg)	Chemical Composition (%)											Tensile Test			Impact Test (V-notch)				Remarks (Impact Specimen Size)				
				C	Si	Mn	P	S	Cu	Mo	Al	Nb	Sn	CE ⁽¹⁾	Tensile Strength	Yield point	Elongation ⁽²⁾	Yield Ratio	AVG	1	2		3			
				×100		×1000		×100		×1000			×100	N/mm ²		%		()	C							
24X9X94 40.00 FT	N 025776	9	15,354	19	18	68	28	7	22	2	8	19	26	5	11	37	578	440	23.0	0.78						
24X7X62 40.00 FT	E 177808	11	12,375	16	13	58	18	5	24	3	5	8	13	4	12	30	502	380	27.0	0.76						
24X7X62 40.00 FT	E 177853	1	1,125	16	17	53	23	9	26	2	6	8	10	13	4	11	30	502	375	26.5	0.75					
24X7X62 40.00 FT	E 177874	1	1,125	15	14	51	19	7	28	2	4	8	12	4	12	31	512	386	25.0	0.75						
24X7X62 40.00 FT	E 177878	1	1,125	16	18	54	22	7	29	2	7	8	11	12	5	11	32	512	392	26.0	0.77					
24X7X62 40.00 FT	E 177883	12	13,500	16	15	52	23	7	21	2	5	8	9	12	4	10	29	609	386	26.5	0.76					
24X7X62 40.00 FT	E 177887	3	3,375	16	14	51	31	7	26	4	6	10	12	13	4	11	30	539	391	25.0	0.72					
24X7X62 40.00 FT	E 177902	2	2,250	16	15	55	25	5	25	4	6	10	12	13	6	11	31	504	383	27.0	0.76					
24X7X62 40.00 FT	E 177906	3	3,375	15	11	54	22	9	29	2	4	10	11	12	4	13	29	501	372	26.0	0.74					
SUB TOTAL		43	53,604															506	374	26.5	0.74					

(Note) (1) Ceq: (CE=C+Mn/6+Cr/5+V/5+Mo/5+Ni/15+Cu/15)

(2) Gauge length : 200 mm

(3) Yield Ratio = YP/TS

J. C. Ahn

General Manager of Q.A Team

WE HEREBY CERTIFY THAT THE MATERIAL HAS BEEN MADE AND TESTED IN ACCORDANCE WITH THE ABOVE SPECIFICATION AND ALSO WITH THE REQUIREMENTS CALLED FOR THE ABOVE ORDER

HMS I 102(A)-3a

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A4(210x297)

MILL TEST CERTIFICATE



Contract No.	
Customer	DUFERCO
L/C No.	
P/O No.	32201411C311
Commodity	H-BEAM
Specification	ASTM A572 G50/A992/ CSA 350W

Head Office	63, Jungbong-daero, Dong-gu, Incheon, 401-712, S. Korea
Certificate No.	IH20141103209 - 17
Class Cert. No.	
Date of Issue	2014-11-17

Dimensions & Length	Heat No.	Pieces Weights (kg)	Chemical Composition (%)											Tensile Test			Impact Test (V-notch)				Remarks (Impact Specimen Size)		
			C	Si	Mn	P	S	Cu	Mo	Al	Nb	Sn	CE ⁽¹⁾	Tensile Strength	Yield point	Elongation ⁽²⁾	Yield Ratio	AVG	1	2		3	
			×100			×1000		×100		×1000			×100	N/mm ²		%		()	C				
24X7X62 40.00 FT	E 177916	1 1,125	16	12	52	18	8	26	2	7	14	5	11	29	506	381	26.0	0.75					
24X7X62 40.00 FT	E 177919	12 13,500	17	12	57	29	7	25	2	4	15	5	10	32	510	388	26.0	0.76					
24X7X62 40.00 FT	E 177920	8 9,000	16	13	54	26	7	29	2	4	13	5	11	30	508	382	25.0	0.75					
TOTAL		3,645 2,885,643												510	384	25.5	0.75						

===== END =====

(Note) (1) Ceq: (CE=C+Mn/6+Cr/5+V/5+Mo/5+Ni/15+Cu/15) (2) Gauge length : 200 mm (3) Yield Ratio = YP/TS

J. C. Ahn
General Manager of Q.A Team

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