

(Bukjeong-dong), 35,
 Sanmakgongdannam 11-gil,
 Yangsan-si, Gyeongsangnam-do,
 Korea
 TEL. 82-55-783-1000

MATERIAL TEST REPORT

(EN10204 3.1:2004)

BMT CO., LTD

CUSTOMER	SUPERLOK USA	CERT' NO	MTR-131125-01
P.O No	PO 325	Project Name	N/A
SPECIFICATION	ASTM A276	STEEL GRADE	316
RawMaterial Maker	Seah Special Steel Co., Ltd.	ISSUE DATE	Nov. 25, 2013

HCN (HEAT CODE NO)	DESCRIPTION	Q'TY (EA)	Heat Treatment	Dimension and Visual Inspection
SDW	IHRC-12N-4N	7	Solution Treatment	GOOD

CHEMICAL COMPOSITION (%)

HCN (HEAT CODE NO)	SPEC	C	Si	Mn	P	S	Cr	Mo	Ni	Cu			
SDW		0.02	0.42	1.41	0.030	0.023	16.80	2.11	10.07	0.35			

MECHANICAL PROPERTIES

HCN (HEAT CODE NO)	SPEC	TS	YS	EL	RA	HARDNESS	
		KSI	KSI	%	%	HB	
SDW		128	111	23	65	277	

REMARK

WE HEREBY CERTIFY THAT MATERIAL HAS BEEN TESTED IN ACCORDANCE WITH THE SPECIFICATION.

■ Approved by :

QA Dept. Managing Director

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MATERIAL TEST REPORT

(EN10204 3.1:2004)

 **BMT CO., LTD**

CUSTOMER	SUPERLOK USA	CERT' NO	MTR-131125-02
P.O No	PO 354	Project Name	N/A
SPECIFICATION	ASTM A276	STEEL GRADE	316
RawMaterial Maker	Seah Special Steel Co., Ltd.	ISSUE DATE	Nov. 25, 2013

HCN (HEAT CODE NO)	DESCRIPTION	Q'TY (EA)	Heat Treatment	Dimension and Visual Inspection
SEP	SMC-4-6N-TM	40	Solution Treatment	GOOD
SCV	SMA-8-16N	10	Solution Treatment	GOOD

CHEMICAL COMPOSITION (%)

HCN (HEAT CODE NO)	SPEC	C	Si	Mn	P	S	Cr	Mo	Ni	Cu			
SEP		0.02	0.42	1.42	0.028	0.020	16.73	2.09	10.07	0.27			
SCV		0.03	0.48	1.81	0.033	0.020	16.88	2.11	10.05	0.36			

MECHANICAL PROPERTIES

HCN (HEAT CODE NO)	SPEC	TS	YS	EL	RA	HARDNESS	
		KSI	KSI	%	%	HB	
SEP		134	109	24	62	275	
SCV		116	103	27	67	269	

REMARK

WE HEREBY CERTIFY THAT MATERIAL HAS BEEN TESTED IN ACCORDANCE WITH THE SPECIFICATION.

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MATERIAL TEST REPORT

(EN10204 3.1:2004)

BMT CO., LTD

CUSTOMER	SUPERLOK USA	CERT' NO	MTR-131125-03
P.O No	PO 355	Project Name	N/A
SPECIFICATION	ASTM A276	STEEL GRADE	316
RawMaterial Maker	POSCO SPECIALTY STEEL	ISSUE DATE	Nov. 25, 2013

HCN (HEAT CODE NO)	DESCRIPTION	Q'TY (EA)	Heat Treatment	Dimension and Visual Inspection
SQZ	SBVF3602-S6	130	Solution Treatment	GOOD

CHEMICAL COMPOSITION (%)

HCN (HEAT CODE NO)	SPEC	C	Si	Mn	P	S	Cr	Mo	Ni	Cu			
SQZ		0.03	0.39	1.35	0.035	0.024	16.91	2.06	10.01	0.32			

MECHANICAL PROPERTIES

HCN (HEAT CODE NO)	SPEC	TS	YS	EL	RA	HARDNESS	
		KSI	KSI	%	%	HB	
SQZ		88	42	56	76	158	

REMARK

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MATERIAL TEST REPORT

(EN10204 3.1:2004)

BMT CO., LTD

CUSTOMER	SUPERLOK USA	CERT' NO	MTR-131125-04
P.O No	PO 360	Project Name	N/A
SPECIFICATION	ASTM A276	STEEL GRADE	316
RawMaterial Maker	Seah Special Steel Co., Ltd.	ISSUE DATE	Nov. 25, 2013

HCN (HEAT CODE NO)	DESCRIPTION	Q'TY (EA)	Heat Treatment	Dimension and Visual Inspection
SNT	IHLN-2N-76L	40	Solution Treatment	GOOD
SEJ	SMA-4-4N	100	Solution Treatment	GOOD
SCN	SRUE-8-4	40	Solution Treatment	GOOD
SCD	SRUT-4-2	10	Solution Treatment	GOOD

CHEMICAL COMPOSITION (%)

HCN (HEAT CODE NO)	SPEC	C	Si	Mn	P	S	Cr	Mo	Ni	Cu			
SNT		0.02	0.39	1.41	0.030	0.017	16.88	2.07	10.09	0.36			
SEJ		0.02	0.39	1.41	0.029	0.018	16.77	2.07	10.08	0.27			
SCN		0.02	0.43	1.38	0.030	0.020	16.65	2.03	10.02	0.29			
SCD		0.02	0.37	1.44	0.030	0.022	16.77	2.04	10.03	0.25			

MECHANICAL PROPERTIES

HCN (HEAT CODE NO)	SPEC	TS	YS	EL	RA	HARDNESS	
		KSI	KSI	%	%	HB	
SNT		139	109	20	58	275	
SEJ		141	107	22	60	275	
SCN		97	64	44	74	209	
SCD		103	74	42	70	219	

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MATERIAL TEST REPORT

(EN10204 3.1:2004)

 **BMT CO., LTD**

CUSTOMER	SUPERLOK USA	CERT' NO	MTR-131125-05
P.O No	PO 368	Project Name	N/A
SPECIFICATION	ASTM A276	STEEL GRADE	316
RawMaterial Maker	Seah Special Steel Co., Ltd.	ISSUE DATE	Nov. 25, 2013

HCN (HEAT CODE NO)	DESCRIPTION	Q'TY (EA)	Heat Treatment	Dimension and Visual Inspection
SEP	SMC-8-4N	300	Solution Treatment	GOOD

CHEMICAL COMPOSITION (%)

HCN (HEAT CODE NO)	SPEC	C	Si	Mn	P	S	Cr	Mo	Ni	Cu			
SEP		0.03	0.48	1.44	0.030	0.021	16.82	2.05	10.04	0.27			

MECHANICAL PROPERTIES

HCN (HEAT CODE NO)	SPEC	TS	YS	EL	RA	HARDNESS	
		KSI	KSI	%	%	HB	
SEP		135	108	24	63	275	

REMARK

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MATERIAL TEST REPORT

(EN10204 3.1:2004)

BMT CO., LTD

CUSTOMER	SUPERLOK USA	CERT' NO	MTR-131125-06
P.O No	PO 369	Project Name	N/A
SPECIFICATION	ASTM A276	STEEL GRADE	316
RawMaterial Maker	POSCO SPECIALTY STEEL/ Seah Special Steel Co., Ltd.	ISSUE DATE	Nov. 25, 2013

HCN (HEAT CODE NO)	DESCRIPTION	Q'TY (EA)	Heat Treatment	Dimension and Visual Inspection
SRN	SHCV2-S8-1P	100	Solution Treatment	GOOD
SFV	SHCV2-S6-1P-E	100	Solution Treatment	GOOD
SNR	SINV3-S8-RS	50	Solution Treatment	GOOD
SEJ	SMC-1-1N	55	Solution Treatment	GOOD
SQZ	SP-4	1500	Solution Treatment	GOOD
SNB	SBV120H33-S6	10	Solution Treatment	GOOD

CHEMICAL COMPOSITION (%)

HCN (HEAT CODE NO)	SPEC	C	Si	Mn	P	S	Cr	Mo	Ni	Cu			
SRN		0.02	0.46	1.46	0.030	0.022	16.79	2.04	10.08	0.26			
SFV		0.02	0.37	1.41	0.031	0.021	16.82	2.11	10.02	0.27			
SNR		0.02	0.54	1.42	0.029	0.022	16.73	2.03	10.05	0.42			
SEJ		0.02	0.39	1.41	0.029	0.018	16.77	2.07	10.08	0.27			
SQZ		0.02	0.43	1.79	0.029	0.027	16.81	2.07	10.23	0.30			
SNB		0.02	0.42	1.81	0.031	0.023	16.72	2.08	10.01	0.36			

MECHANICAL PROPERTIES

HCN (HEAT CODE NO)	SPEC	TS	YS	EL	RA	HARDNESS	
		KSI	KSI	%	%	HB	
SRN		124	110	23	60	265	
SFV		128	103	23	61	275	
SNR		91	47	57	75	157	
SEJ		140	114	20	58	270	
SQZ		88	59	51	76	193	
SNB		89	49	55	80	159	

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MATERIAL TEST REPORT

(EN10204 3.1:2004)

 **BMT CO., LTD**

CUSTOMER	SUPERLOK USA	CERT' NO	MTR-131125-07
P.O No	PO 369	Project Name	N/A
SPECIFICATION	ASTM A276	STEEL GRADE	316
RawMaterial Maker	POSCO SPECIALTY STEEL	ISSUE DATE	Nov. 25, 2013

HCN (HEAT CODE NO)	DESCRIPTION	Q'TY (EA)	Heat Treatment	Dimension and Visual Inspection
SFO	IRSE-8N-6N	20	Solution Treatment	GOOD
SND	IRSE-8N-4N	5	Solution Treatment	GOOD

CHEMICAL COMPOSITION (%)

HCN (HEAT CODE NO)	SPEC	C	Si	Mn	P	S	Cr	Mo	Ni	Cu			
SFO		0.02	0.39	1.38	0.031	0.021	16.65	2.03	10.03	0.28			
SND		0.02	0.40	1.79	0.031	0.024	16.97	2.06	10.10	0.34			

MECHANICAL PROPERTIES

HCN (HEAT CODE NO)	SPEC	TS	YS	EL	RA	HARDNESS	
		KSI	KSI	%	%	HB	
SFO		87	44	57	79	148	
SND		91	49	52	76	163	

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MATERIAL TEST REPORT

(EN10204 3.1:2004)

 **BMT CO., LTD**

CUSTOMER	SUPERLOK USA	CERT' NO	MTR-131125-08
P.O No	PO 369-1	Project Name	N/A
SPECIFICATION	ASTM A276	STEEL GRADE	316
RawMaterial Maker	Seah Special Steel Co., Ltd.	ISSUE DATE	Nov. 25, 2013

HCN (HEAT CODE NO)	DESCRIPTION	Q'TY (EA)	Heat Treatment	Dimension and Visual Inspection
SCB	SBLV-M4N-S	40	Solution Treatment	GOOD
SRB	SRUE-2-1	20	Solution Treatment	GOOD

CHEMICAL COMPOSITION (%)

HCN (HEAT CODE NO)	SPEC	C	Si	Mn	P	S	Cr	Mo	Ni	Cu			
SCB		0.03	0.48	1.36	0.030	0.020	16.68	2.03	10.04	0.27			
SRB		0.02	0.41	1.37	0.030	0.024	16.59	2.16	10.20	0.39			

MECHANICAL PROPERTIES

HCN (HEAT CODE NO)	SPEC	TS	YS	EL	RA	HARDNESS	
		KSI	KSI	%	%	HB	
SCB		130	107	22	59	275	
SRB		107	84	40	70	238	

REMARK

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MATERIAL TEST REPORT

(EN10204 3.1:2004)

BMT CO., LTD

CUSTOMER	SUPERLOK USA	CERT' NO	MTR-131125-09
P.O No	SFS-372	Project Name	N/A
SPECIFICATION	ASTM A276	STEEL GRADE	316
RawMaterial Maker	POSCO SPECIALTY STEEL/ Seah Special Steel Co., Ltd.	ISSUE DATE	Nov. 25, 2013

HCN (HEAT CODE NO)	DESCRIPTION	Q'TY (EA)	Heat Treatment	Dimension and Visual Inspection
SRA	SMC-2-6N	40	Solution Treatment	GOOD
SND	SMC-16-16N	500	Solution Treatment	GOOD
SFV	SAA-8-8U	80	Solution Treatment	GOOD
SCV	SRUE-6-4	50	Solution Treatment	GOOD
SDW	IHN-8N	1200	Solution Treatment	GOOD
SRN	IRT-8N	150	Solution Treatment	GOOD

CHEMICAL COMPOSITION (%)

HCN (HEAT CODE NO)	SPEC	C	Si	Mn	P	S	Cr	Mo	Ni	Cu			
SRA		0.02	0.49	1.42	0.028	0.021	16.69	2.11	10.14	0.24			
SND		0.02	0.53	1.49	0.029	0.021	16.73	2.05	10.06	0.29			
SFV		0.02	0.35	1.39	0.029	0.020	16.88	2.06	10.09	0.27			
SCV		0.02	0.42	1.80	0.028	0.021	16.72	2.12	10.15	0.31			
SDW		0.02	0.41	1.40	0.030	0.024	16.61	2.13	10.10	0.40			
SRN		0.02	0.40	1.79	0.031	0.024	16.97	2.06	10.10	0.34			

MECHANICAL PROPERTIES

HCN (HEAT CODE NO)	SPEC	TS	YS	EL	RA	HARDNESS	
		KSI	KSI	%	%	HB	
SRA		130	106	23	60	265	
SND		121	116	32	63	269	
SFV		131	107	22	60	270	
SCV		92	50	52	77	149	
SDW		128	106	24	59	275	
SRN		91	49	52	76	163	

REMARK

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MATERIAL TEST REPORT

(EN10204 3.1:2004)

BMT CO., LTD

CUSTOMER	SUPERLOK USA	CERT' NO	MTR-131125-10
P.O No	SFS-372	Project Name	N/A
SPECIFICATION	ASTM A276	STEEL GRADE	316
RawMaterial Maker	Seah Special Steel Co., Ltd.	ISSUE DATE	Nov. 25, 2013

HCN (HEAT CODE NO)	DESCRIPTION	Q'TY (EA)	Heat Treatment	Dimension and Visual Inspection
SCA	SMA-2-2N	40	Solution Treatment	GOOD
SEP	IPP-2N	100	Solution Treatment	GOOD
SCN	SBHU-16	10	Solution Treatment	GOOD

CHEMICAL COMPOSITION (%)

HCN (HEAT CODE NO)	SPEC	C	Si	Mn	P	S	Cr	Mo	Ni	Cu			
SCA		0.02	0.51	1.41	0.035	0.023	16.57	2.04	10.21	0.34			
SEP		0.03	0.39	1.78	0.031	0.022	16.63	2.04	10.09	0.30			
SCN		0.02	0.43	1.77	0.030	0.023	16.80	2.06	10.04	0.34			

MECHANICAL PROPERTIES

HCN (HEAT CODE NO)	SPEC	TS	YS	EL	RA	HARDNESS	
		KSI	KSI	%	%	HB	
SCA		132	104	20	59	275	
SEP		140	117	20	60	295	
SCN		113	80	33	68	255	

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MATERIAL TEST REPORT

(EN10204 3.1:2004)

BMT CO., LTD

CUSTOMER	SUPERLOK USA	CERT' NO	MTR-131125-11
P.O No	PO 367	Project Name	N/A
SPECIFICATION	B124	STEEL GRADE	UNS C37700
RawMaterial Maker	DAE CHANG IND.CO.,LTD	ISSUE DATE	Nov. 25, 2013

HCN	DESCRIPTION	Q'TY (EA)	Heat Treatment	Dimension and Visual
SCA	SBHU-4-B	100	Annealing	GOOD

CHEMICAL COMPOSITION (%)

HCN	SPEC	Cu	Pb	Fe	Sn	Fe+Sn	Zn						
	Min	57.00	1.00	-	-	-	Rem						
	Max	61.00	2.50	-	-	1.0	Rem						
SCA		60.30	2.10	0.14	0.14	0.28	Rem						

MECHANICAL PROPERTIES

HCN	SPEC	TS	YS	EL	RA	HARDNESS	
		N/mm ²	N/mm ²	%	%	HV	
	Min	-	-	-	-		
Max	-	-	-	-			
SCA		427	-	-	-	141.8	

REMARK

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MATERIAL TEST REPORT

(EN10204 3.1:2004)

BMT CO., LTD

CUSTOMER	SUPERLOK USA	CERT' NO	MTR-131125-12
P.O No	PO 369	Project Name	N/A
SPECIFICATION	B124	STEEL GRADE	UNS C37700
RawMaterial Maker	DAE CHANG IND.CO.,LTD	ISSUE DATE	Nov. 25, 2013

HCN	DESCRIPTION	Q'TY (EA)	Heat Treatment	Dimension and Visual
SCA	SBHU-2-B	230	Annealing	GOOD

CHEMICAL COMPOSITION (%)

HCN	SPEC	Cu	Pb	Fe	Sn	Fe+Sn	Zn						
	Min	57.00	1.00	-	-	-	Rem						
	Max	61.00	2.50	-	-	1.0	Rem						
SCA		60.50	2.46	0.17	0.17	0.34	Rem						

MECHANICAL PROPERTIES

HCN	SPEC	TS	YS	EL	RA	HARDNESS	
		N/mm ²	N/mm ²	%	%	HV	
	Min	-	-	-	-	-	
Max	-	-	-	-	-		
SCA		432	-	-	-	145.4	

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MATERIAL TEST REPORT

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BMT CO., LTD

CUSTOMER	SUPERLOK USA	CERT' NO	MTR-131125-13
P.O No	SFS-372	Project Name	N/A
SPECIFICATION	B124	STEEL GRADE	UNS C37700
RawMaterial Maker	DAE CHANG IND.CO.,LTD	ISSUE DATE	Nov. 25, 2013

HCN	DESCRIPTION	Q'TY (EA)	Heat Treatment	Dimension and Visual
SCV	SMC-6-8N-B	95	Annealing	GOOD
SCD	SFC-4-4N-B	50	Annealing	GOOD
SRB	SRU-8-6-B	40	Annealing	GOOD
SFA	SUE-6-B	70	Annealing	GOOD
SCV	SUE-4-B	50	Annealing	GOOD

CHEMICAL COMPOSITION (%)

HCN	SPEC	Cu	Pb	Fe	Sn	Fe+Sn	Zn						
	Min	57.00	1.00	-	-	-	Rem						
	Max	61.00	2.50	-	-	1.0	Rem						
SCV		58.90	1.56	0.32	0.28	0.60	Rem						
SCD		60.25	1.22	0.43	0.54	0.97	Rem						
SRB		60.22	1.54	0.28	0.55	0.83	Rem						
SFA		59.45	2.46	0.16	0.67	0.83	Rem						
SCV		58.54	2.13	0.33	0.16	0.49	Rem						

MECHANICAL PROPERTIES

HCN	SPEC	TS	YS	EL	RA	HARDNESS	
		N/mm ²	N/mm ²	%	%	HV	
	Min	-	-	-	-	-	
Max	-	-	-	-	-		
SCV		452	-	-	-	132.7	
SCD		432	-	-	-	246.5	
SRB		416	-	-	-	146.5	
SFA		408	-	-	-	155.5	
SCV		411	-	-	-	321.4	

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