

CERTIFICATE OF MATERIAL

(EN10204 : 2004 3.1)

Customer: Southwest Stainless & Alloy	Project:	P.O. No. : 688199-00	Heat Treatment #1																
Spec. For Material : A/SA182 F316/316L+NACE (2017ED)	Chemical Composition (%)																		
	Spec.	C	Si	Mn	P	S	Ni	Cr	Mo	V	Cu	Nb	Al	W	Ti	N	Ceq	Co	
	Min.						10.00	16.00	2.00										
	Max.	0.030	1.00	2.00	0.045	0.030	14.00	16.00	3.00							0.10			
Heat No. & Lot No. : OUTOKUMPU E171382-91.6A	H	0.019	0.50	1.41	0.034	0.031	10.08	17.05	2.43							0.047		0.290	
	F																		

Raw Certificate No. : R040771		Tension Test						Charpy Impact Test (10*10*55mm)				Bending Test	Dimensional Inspection		
Direction #3	Specimen		Spec	Yield Strength MPa	Tensile Strength MPa	Elongation %	Red. of Area %	Hardness (HBW)	Individual		Average		Notch Type	Temp.	GOOD
	Dia. mm	Gage Length mm							MIN	MAX	Test Result				
	12.5	50.0	Min. Max.	205	515	30	50	297	1	2	3	Ave.		Visual Inspection	
L	12.5	50.0		282	553	55	72	163,165						GOOD	

Description				Remark	
No.	Dimension	Q. %	Item No. /POR No.		
3	B16.5 150# BL RF 3/4	5 EA		- NACE MR0175; ISO 15156/MRO'03/ISO 17945 (2016E1)	
9	B16.5 300# BL RF 4"	25 EA			
17	B16.5 300# LJ 3"	100 EA		- No repair welding	
32	B16.5 150# SO RF 3"	25 EA		- PED 2014/68/EU (Cert No.: CE-PED-MW-D-1-001-17-KOR)	
33	B16.5 150# SO RF 4"	25 EA			
46	B16.5 150# SW RF 3" S/40S	15 EA		- ISO 9001:2015 (Cert No.: 102BK00860)	
57	B16.5 300# THREAD RF 3/4"	5 EA		Melting process : EAF+VD	
74	B16.5 150# WN RF 3" S/10S	1 EA			
79	B16.5 300# WN RF 3" S/10S	1 EA			

We hereby certify that the material herein has been made and tested in accordance with the above specification and also with the requirements called for by the above order.

Inspector: _____ Manager of Quality Assurance Dept: _____

Notes #1 Heat Treatment : N = Normalizing A = Annealing Q = Quenching T = Tempering R = Stress Relieving S = Solution Treatment SA = Solution Annealing
 STA = Stabilized Annealed O = Other Q1 = Quenching Tempering Z = Stabilization NT = Normalizing Tempering
 #2 TR : Trace A.C = Air Cooled W.C = Water Cooled F.C = Furnace Cooled O.C = Oil Cooled R.C = Rapid Air Cooling S.A = Solution Annealing A.Q = Water Quenched
 #3 Direction : C=Crosswise L=Longitudinal Tr=Transverse T=Tangential R=Radial J-LW-12(Direction Parallel to the Axis of the Vessel)

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 SSFLANGE 3/4IN 150# 316 SS BLIND
 FLANGE IMPORT



HEAT TREATMENT CERTIFICATE

RECORD NO. : DHH190516-32	Mill Identity No. : E180463
Customer	Heating No. : 19-05-16-1
Order No. : 6000160-00	Lot No. : 95168
DH Work No. : 99-1902-68	Method of Heat Treatment : Solution Treatment
Project Name	Material Specification : A5A182 F316/316L+NACE (2017ED)

ITEM LIST		Heat Treatment Cycle	
No.	DESCRIPTION	Qty	
94	B16.5 150# WN RF 3" S/40S	50	
101	B16.5 300# WN RF 3/4" S/80S	50	
TOTAL BLANK		380	

Heat treatment Furnace Information				Inspection						
Furnace ID No.	DHM4-22			Kind of Inspection	Standard	1	2	3	4	5
Working Zone (mm)	3200W*2200H*620D				Visual	No crack/defect	GOOD			
Max. Load	50Ton/Chg			Hardness	MAX. 237 HBW	160	163			
Thermocouple	6 PCS			Location of the thermocouple (Roof fixed)		REMARK				
Calibration Status										
Equip.	Serial No.	Date of calibration	Expiration date							
Controller	DN10ZE359	2019-07-01	2020-06-30							
	KN113LD22	2019-07-01	2020-06-30							
Recorder	S5E605524	2019-07-01	2020-06-30							
Thermocouple	DH1	2019-01-29	2020-01-28							
	DH2	2019-01-29	2020-01-28							
	DH3	2019-01-29	2020-01-28							
	DH4	2019-01-29	2020-01-28							
	DH7	2019-01-29	2020-01-28							
	DH8	2019-01-29	2020-01-28							
				Inspector						

OSP-11-008 (rev.3)

DAE HEUNG IND. CO., LTD.

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 SSFLANGE 3/4IN 150# 316 SS BLIND
 FLANGE IMPORT

1063-20-0-06113-1108-1-2019-05-10

DAE HEUNG IND. Co., Ltd.

HEAT TREATMENT CHART

REPORT No.	011180518-42	DATE	2019-05-10
METHOD	Solution Treatment	THERMO. COUPLE	6PCS
HOLDING TEMP. & TIME	1650 ± 9 28HRS	RECORD SPEED	25 mm/hr
CUSTOMER	LOT No.	ITEM	QTY
	95-16B	19, 27, 40, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000	185 EA
Material, Stainless & Alloy	PO No.		
	6006183-00		

(Q. no. 1)

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SSFLANGE 3/4IN 150# 316 SS BLIND
FLANGE IMPORT

HYUNDAE FITTING CO., LTD.
 #101, Myeongryesandan 5-ro, Jangam-eup,
 Gijang-gu, 46028, Busan, Korea
 TEL : (051) 831-0891-5 / FAX : (051) 831-0895

MATERIAL TEST CERTIFICATE

Date 2019-10-18 Page : 1/1

EN 10204 (ISO 10474) 3.1

Certificate No : MCT-GA-1910-0645 Material : A/SA182-F316/316L+NACE Control No :
 Customer : Project No : Raw Material No : 180628-FX01PW-0001A1-0001
 Class Cert No : Specification : ASTM A182/ASME SA182-F316/316L+NACE Others : POSCO


Heat No.	Spec	Chemical Composition (%) *4														Heat Treatment *1		
		C	Si	Mn	P	S	Ni	Cr	Mo	Cu	V	Nb	N	Ti	Al		W	CEQ
SD93939	Min	0.03	1.00	2.00	0.045	0.03	10.00	16.00	2.00									
	Max						18.00	18.00	3.00				0.100					
Heat (L)		0.027	0.48	1.25	0.029	0.001	10.05	16.62	2.02	0.23			0.070					

Location	Tensile Test						Impact Test		Hardness Test	Bending Test	Remark	Dimension & Visual
	Size of Specimen		Temp °C	Y.S	T.S	EL	RA	Temperature (°C)				
	Dia (mm)	Gage Length (mm)		MPa	MPa	%	%	Notch Type				
			*3	Min	Min	Min	Min	Min(I)	Avg(I)	Max		
T	12.5	50.0	RT	205	515	30	50			237		U.T
	12.5	50.0	RT	314	528	51	75			180,160		NA

Class	Product	Size	Qty	Pd. No.	Line No	PCR No	Customer Requirement
150#	BLRF	3/4"	15	6000864-00	13		NACE MR0175/ISO 15158_2015 NACE MR0103/ISO 17495-1:2016
150#	LJFF	6"	50	6000864-00	40		
150#	SCFF	1/2"	25	6000864-00	62		ASME SEC. II PART "A" (17ED) ASTM A182/A182M-16a
150#	SCFF	4"	25	6000864-00	68		
150#	SCFF	6"	15	6000864-00	70		Country of Origin : Republic of Korea Design Code : ASME B16.5

Reviewed By: _____ Witnessed By: _____

We hereby certify that the material herein has been made and tested in accordance with the above specification and also with the requirements called for by the above order.



* Notes 1 - N = Normalized, A = Annealed, Q = Quenched, T = Tempered, S.T = Solution Treated, A.C = Air Cooled, W.C = Water Cooled, O.C = Oil Cooled
 * Notes 2 - T = Tangential, Tr = Transverse, L = Longitudinal, Z = Through-Thick * Notes 3 - RT = Room Temperature * Notes 4 - T.R = Trace

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 SSFLANGE 3/4IN 150# 316 SS BLIND
 FLANGE IMPORT

DAE HEUNG IND. CO., LTD.

HEAT TREATMENT CHART

REPORT No.	DATE	ITEM	QTY
DHHT 900622-41	2019-05-22	ITEM 3	318 EA
METHOD	SOULDER TREATMENT	ITEM 3	318 EA
HOLDING TEMP. & TIME	055°C - 10.5 HRS	ITEM 3	318 EA
CUSTOMER	SOULWEST STEELWORKS & ALLOY	ITEM 3	318 EA
EQ. NO.	033229	ITEM 3	318 EA
PO. NO.	6800083300	ITEM 3	318 EA
HEAT NO.	HT-2019-05-22-019	ITEM 3	318 EA

100% (100% Satisfied)

DAE HEUNG IND. CO., LTD.
19-05-22-1

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 SS FLANGE 3/4IN 150# 316 SS BLIND
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