APPENDIX I

COMPARISON OF THE MATERIALS
LISTED IN THE APPENDIX
TO REPORT N° 4 WITH
BRITISH & AMERICAN SPECIFICATIONS

1. CARBON STEEL BAR OR FORGING

Nº	NAME	TENSILE STRENGTH		0.2% PROOF STRESS		ELONGATION IN 2"	HARDNESS		BRITISH AND/OR AMERICAN SPECIFICATION EQUIVALENT			JAPANESE CODE NUMBER
		TONS PER SQ. IN.	POUNDS PER SQ. IN.	TONS PER SQ. IN.	POUNDS PER SQ. IN.	%	BRINELL	ROCKWELL	OVERALL	CHEMICAL	PHYSICAL	
1	EXTRA MILD STEEL	22.8 – 26.6	51,000 – 59,600	12.1 – 18.4	28,300 – 41,200	>30	82 – 100	B48 – B60	BS. 32 Grade 4. (E)0543	—	—	T 001
2	SEMI-MILD STEEL	>28.5	>63,700	>17.8	>39,800	>28	110 – 160	B65 – B84	AN-QQ-S-646	—	—	T 002
3	MILD STEEL	>31.7	>71,000	>19.7	>44,100	>24	120 – 170	B70 – B87	S6	—	—	T 003
		>31.7	>71,000	>25.4	>56,700	>22	170 – 230	B87 – B98	S76	—	—	T 003
4	SEMI-HARD STEEL.	>44.4	>99,100	>31.7	>70,900	>17	200 – 250	B94 – C24	—	—	—	T 004
5	HARD STEEL	>50.8	>113,400	>38.1	>85,000	>14	230 – 280	C21 – C29	S79	—	—	T 005

2 CARBON STEEL SHEET

Nº	NAME	TENSILE STRENGTH		ELONGATION IN 2" %	MINIMUM BEND RADIUS	BRITISH AND/OR AMERICAN SPECIFICATION EQUIVALENT			JAPANESE CODE NUMBER
		TONS PER SQ.IN	POUNDS PER SQ. IN			OVERALL	CHEMICAL	PHYSICAL	
1	EXTRA-MILD STEEL	21·6-	48,300	>25	BENT	S 94	—	—	□ 001
		26·0	58,100		FLAT				
2	SEMI-MILD STEEL	24·7-	55,100-	>21	1 × THICKNESS	AN-S-11	—	—	—
		29·8	66,500		OF SHEET				
3	SEMI-HARD STEEL	27·9-	62,100-	>20	1·5 × THICKNESS	—	—	S 3	—
		31·7	70,900		OF SHEET				
4	HARD STEEL	>31·7	>70,900	>17	2 × THICKNESS	—	—	—	□ 005
					OF SHEET				

2. CARBON STEEL TUBE

Nº	NAME	TENSILE STRENGTH		ELONGATION IN 2"	BRITISH AND/OR AMERICAN SPECIFICATION EQUIVALENT			JAPANESE CODE NUMBER
		TONS PER SQ.IN.	POUNDS PER SQ. IN.	%	OVERALL	CHEMICAL	PHYSICAL	
1	EXTRA-MILD STEEL	>19·1	>42,700	>30	T 26	—	—	∧001A
2	SEMI-MILD STEEL	>29·2	>65,100	>30	AN-WW-T-846	—	—	∧002A
		>27·9	>62,100	—	T35, DTD 563S, AN-WW-T-846	—	—	∧002A
3	SEMI-HARD STEEL	>34·9	>76,900	—	T 1	—	—	—
		>49·4	>110,000	—	T 50	—	—	—
4	HARD STEEL	>29·8	>66,500	—	—	—	—	∧005

3 SPECIAL STEELS (GROUP I) BAR OR FORGING

N°	NAME	TENSILE STRENGTH		0·2% PROOF STRESS		ELONGATION IN 2" %	HARDNESS		BRITISH AND/OR AMERICAN SPECIFICATION EQUIVALENT			JAPANESE CODE NUMBER
		TONS PER SQ IN	POUNDS PER SQ IN.	TONS PER SQ IN	POUNDS PER SQ. IN.		BRINELL	ROCKWELL	OVERALL	CHEMICAL	PHYSICAL	
1	80 KGM Ni-Cr STEEL	>54·5	>122,000	>44·4	>99,000	>18	250-302	C24-C32	S11	—	—	T 204
2	94 KGM Ni-Cr STEEL	>59·7	>133,000	>49·5	>110,500	>15	270-321	C28-C34	S81	—	—	T 205
3	100 KGM Ni-Cr STEEL	>64·7	>144,000	—	—	>17	290-341	C31-C36	S65	—	—	T 206
4	115 KGM Ni-Cr STEEL	>73·0	>163,000	>63·5	>142,000	>14	350	C37	DTD 331	—	—	T 208
5	160 KGM Ni-Cr STEEL	>101·6	>227,000	—	—	>7	>447	>C46	S28	—	—	T 210
6	TAHARD STEEL	>116·0	>259,500	—	—	13	APPROX 500	APPROX C50	—	—	—	—
		>107·8	>241,000	—	—	15	465-475	C47-C49	—	—	—	—
		>69·8	>156,000	—	—	>17	APPROX 363	APPROX C38	—	—	—	—

SPECIAL STEELS (GROUP 2) BAR OR FORGING

N°	NAME	TENSILE STRENGTH		0.2% PROOF STRESS		ELONGATION IN 2"	HARDNESS		BRITISH AND/OR AMERICAN SPECIFICATION EQUIVALENT			JAPANESE CODE NUMBER
		TONS PER SQ IN.	POUNDS PER SQ. IN.	TONS PER SQ IN.	POUNDS PER SQ. IN.	%	BRINELL	ROCKWELL	OVERALL	CHEMICAL	PHYSICAL	
1	Cr SEMI-HARD STEEL	>50·8	>113,300	>43·2	>96,400	>15	250-290	C24-C31	—	—	—	T 201
2	Cr-Va STEEL	—	—	—	—	—	—	—	—	AN-QQ-S-687	—	T 112A
3	Cr-Va STEEL	>60·3	>134,700	—	—	>16	270-320	C28-C34	AN-QQ-S-687	—	—	T 112A
4	Cr-Mo STEEL	53·9	120,200	44·4	99000	15	200-275	B94-C29	AN-QQ-S-684	—	—	T 203
5	Si-Mn STEEL	50·8-60·3	113,300-134,700	44·4-50·8	99,000-113,300	15-10	—	—	—	DTD115	—	—
6	Cr-Mo STEEL	>53·9	>120,200	>44·4	>99,000	>16	241	C23	DTD188	—	—	T 234

5 SURFACE CEMENTATION STEEL BAR OR FORGING

Nº	NAME	TENSILE STRENGTH		0·2% PROOF STRESS		ELONGATION IN 2"	HARDNESS		BRITISH AND/OR AMERICAN SPECIFICATION EQUIVALENT			JAPANESE CODE NUMBER
		TONS PER SQ. IN.	POUNDS PER SQ. IN.	TONS PER SQ. IN.	POUNDS PER SQ. IN.	%	BRINELL	ROCKWELL	OVERALL	CHEMICAL	PHYSICAL	
1	LOW CARBON STEEL	>31·7	>71,000	>20·3	>45400	>21	640–735	C59–C64	S14	—	—	T010
2	Cr STEEL	31·7–88·0	71,000–196,600	19·1–62·2	42,700–139,000	30–0	—	—	—	—	—	T 106
3	LOW NICKEL STEEL	>50·8	>113,400	>31·7	>71,000	>15	584–693	C56–C62	S15	—	—	T 102
4	HIGH NICKEL STEEL	>57·1	>127500	>44·4	>99,000	>15	584–693	C56–C62	S67	—	—	T 103
5	LOW Ni Cr STEEL	>63·5	>142,000	>50·8	>113400	>12	584–693	C56–C62	DTD519	—	—	T 104
6	HIGH Ni Cr STEEL	>69·8	>156,000	>57·1	>127,500	>12	518–093	C53–C62	S82	—	—	T 105
7	Cr–Mo STEEL	44·4	99,000	—	—	—	200	B94	—	—	—	T 107
		57·1–69·8	127,500–156,000	38·1	85000	8	—	—	—	—	—	T 107
8	Cr Mo STEEL	47·6	106,300	—	—	—	215	B96	—	—	—	—
		69·8–86·0	156,000–192,200	50·8	113,400	5	—	—	—	—	—	—

6 CASE HARDENING (NITRIDING) STEEL BAR OR FORGING

Nº	NAME	TENSILE STRENGTH		0·2 % PROOF STRESS		ELONGATION IN 2"	HARDNESS		BRITISH AND/OR AMERICAN SPECIFICATION EQUIVALENT			JAPANESE CODE NUMBER
		TONS PER SQ IN.	POUNDS PER SQ. IN.	TONS PER SQ IN.	POUNDS PER SQ. IN.	%	BRINELL	ROCKWELL	OVERALL	CHEMICAL	PHYSICAL	
1	—	54·5	121,700	46·2	103,200	25	260–270	C26–C28	DTD 87	—	—	T 131
		55·8	124,600	52·0	116,000	6·8	830–890	—	DTD 87	—	—	T 131
2	—	53·3	119,000	46·9	104,600	26	260	C 26	DTD 286	—	—	—
		54·5	121,700	48·2	107,600	18	630–660	C60–C63	DTD 286	—	—	—
3	—	>53·9	>120,200	>47·6	>106,300	> 15	900–1050	—	DTD 87, AN-S-19	—	—	T 131
4	—	60·3	134,700	50·8	113,400	24	280–300	C29–C32	—	—	—	—
		64·6	142,700	53·3	119,000	7·5	1100–1130	—	—	—	—	—

Nº	NAME	TENSILE STRENGTH		0.2% PROOF STRESS		ELONGATION IN 2"	HARDNESS		BRITISH AND/OR AMERICAN SPECIFICATION EQUIVALENT			JAPANESE
		TONS PER SQ IN.	POUNDS PER SQ. IN.	TONS PER SQ IN.	POUNDS PER SQ. IN.	%	BRINELL	ROCKWELL	OVERALL	CHEMICAL	PHYSICAL	CODE NUMBER
7	STAINLESS STEEL BAR OR FORGING											
1	Ni-Cr STAINLESS	66·0	147,300	50·8	113,400	18	—	—	AN-QQ-S-771	—	—	—
		43·2	96,400	17·8	39,800	60	175	888	DTD176 AN-QQ-S-771	—	—	—
2	Ni-Cr STAINLESS	—	—	—	—	—	—	—	—	DTD176, AN-QQ-S-771	—	—
3	Cr STAINLESS	—	—	—	—	—	—	—	—	S62	—	1·401
		—	—	—	—	—	—	—	—	DTD463	—	1·401
4	Cr STAINLESS	50·8-57·1	113,400-127,500	44·4-50·8	99,000-113,400	10-12	—	—	S61	—	—	—
5	Cr STAINLESS	—	—	—	—	—	—	—	—	AN-QQ-S-771	—	1·402
8	SPECIAL STEEL TUBE											
2	Ni STEEL	46·4	103,500	—	—	47	—	—	—	—	—	—
3	Cr Mo STEEL	>40·0	>89,300	>31·7	>71,000	>15	—	—	DTD178, AN-WW-T-850	—	—	7\202 (2)
4	Cr STEEL	>38·1	>85,000	>25·4	>56,700	>25	—	—	DTD97, 102	—	—	7\401
1	Cr-Ni STEEL	92-111	205,500-248,000	85·5-103·5	191,000-231,000	11-18	—	—	—	DTD207, 211, AN-WW-T-855, 858	—	7\402

Nº	NAME	TENSILE STRENGTH		0·2 % PROOF STRESS		ELONGATION IN 2" %	HARDNESS		BRITISH AND/OR AMERICAN SPECIFICATION EQUIVALENT			JAPANESE CODE NUMBER
		TONS PER SQ. IN.	POUNDS PER SQ. IN.	TONS PER SQ. IN.	POUNDS PER SQ. IN.		BRINELL	ROCKWELL	OVERALL	CHEMICAL	PHYSICAL	
9	STEEL WIRE	44·3	99,800	—	—	23·3	180	B89	—	DTD 4	—	= 553
1	Cr-V STEEL	104·6	235000	101·5	227000	12·2	APPROX. 400	APPROX. C42	DTD 4	—	—	= 553
2	Si-Mn STEEL	114·0–127·0	255000–284,500	101·5–114·0	227000–255000	8–6	—	—	—	—	DTD 215	= 562
3	Si-Mn-Cr STEEL	>79·2	>177400	>57·0	>127700	>11	>362	>C38	—	—	—	—
10	SPRING STEEL SHEET OR STRIP											
1	CARBON STEEL	>28·5	>63,800	—	—	>10	—	—	DTD167, AN-QQ-S-666	—	—	D 521
2	Si STEEL	95·0	212,600	85·7	192,000	7	—	—	BS970-EN 48	—	—	—
3	Si-Cr STEEL	62·0	138,900	53·9	120,800	12	—	—	BS970-EN47	—	—	—
4	Si-Mn STEEL	>41·2	>92,300	—	—	>12	—	—	—	—	—	—
5	LOW Mn STEEL	73·0–85·7	163,500–192,000	—	—	—	—	—	—	—	—	—
11	STEEL FOR BALL AND ROLLER BEARINGS											
1	—	—	—	—	—	—	—	—	—	BS970-EN 31	—	T 501
2	—	<44·4	<99400	<28·5	<63800	>17	<220	<C19	—	SAA DOCUMENT 100/1/419	—	T 501
		—	—	—	—	—	APPROX. 600	APPROX. C63	SAA DOCUMENT 100/1/419	—	—	T 501

Nº	NAME	TENSILE STRENGTH		0·2 % PROOF STRESS		ELONGATION IN 2" %	HARDNESS		BRITISH AND/OR AMERICAN SPECIFICATION EQUIVALENT			JAPANESE CODE NUMBER
		TONS PER SQ IN.	POUNDS PER SQ. IN.	TONS PER SQ IN.	POUNDS PER SQ. IN.		BRINELL	ROCKWELL	OVERALL	CHEMICAL	PHYSICAL	
1	FORGED HIGH STRENGTH ALUMINIUM ALLOY											
1	Al-Cu-Mg TYPE D	>15·24	>34,170	—	—	>10	>65	>819	—	L1, L39	—	† 201 † 211
		>24·13	>54,100	13·97	31,300	>14	>90	>853	L1, L39	—	—	† 201 † 211
	Al-Cu-Mg TYPE SD, 24S	>26·65	>59,700	16·50	36,980	>12	>100	>859	QQ-A-354 CONDITION T	—	—	† 202 † 212
2	Al-Cu-Si TYPE 25S	>24·13	>54,100	13·97	31,300	>14	>90	>853	QQ-A-367 CONDITION T	—	—	—
3	Al-Cu-Mg-Si HIROMINE	>27·32	>61,200	15·88	35,570	> 8	>120	>870	—	DTD 364	—	—
4	Al-Mg-Si TYPE A51S, ARMINE	>19·05	>42,700	—	—	> 10	>80	>845	QQ-A-367 CONDITION T	—	—	—
2	HIGH STRENGTH ALUMINIUM ALLOY SHEET											
—	Al-Cu-Mg TYPE D	>24·13	>54,100	13·97	31,300	>15	—	—	L 3	—	—	† 221
		<15·88	<35,570	—	—	>10	—	—	—	L 3	—	† 221
—	Al-Cu-Mg TYPE SD, 24 S	>27·32	>61,200	17·78	39,830	> 14	—	—	QQ-A-355 CONDITION T	—	—	† 222 Z
		>27·95	>62,600	20·33	45,500	>10	—	—	QQ-A-355 CONDITION TR	—	—	† 222 ~~Z~~
—	Al-Cu-Mg TYPE C17S	>27·32	>61,200	17·78	39,830	>14	—	—	—	—	QQ-A-355 CONDITION T	—

Nº	NAME	TENSILE STRENGTH		0·2 % PROOF STRESS		ELONGATION IN 2" %	HARDNESS		BRITISH AND/OR AMERICAN SPECIFICATION EQUIVALENT			JAPANESE CODE NUMBER
		TONS PER SQ IN.	POUNDS PER SQ. IN.	TONS PER SQ IN	POUNDS PER SQ. IN.		BRINELL	ROCKWELL	OVERALL	CHEMICAL	PHYSICAL	
3	HIGH STRENGTH ALUMINIUM ALLOY SHEET (CLAD)											
—	OUTER PANEL TYPE SA3	<14·60	<32,700	—	—	>10	—	—	—	—	—	—
—	INNER PANEL TYPE 5D, 24S	>26·67	>59,700	17·15	38,400	>12	—	—	QQ-A-362 CONDITION T	—	—	〒232 Z
		>27·30	>61,000	19·69	44,050	>10	—	—	QQ-A-362 CONDITION TR	—	—	〒232 R
4	FORGED HEAT RESISTING ALUMINIUM ALLOY											
1	Al-Cu-Ni, 'Y' ALLOY	>13·97	>31,280	—	—	>5	>60	>811	—	L 25	—	〒311 Φ
		>19·05	>42,650	—	—	>3	>90	>853	—	L 25	—	〒311 Z
	Al-Cu-Ni, RR 56	>25·40	>56900	—	—	>10	>120	>870	—	DTD130, 410	—	—
	Al-Cu-Ni, RR 59	>22·23	>49,800	—	—	>10	>120	>870	—	L 42	—	—
2	Al-Si, TYPE 325 SILTON	>22·23	>49,800	—	—	>2	>110	>865	—	DTD 324 QQ-A-367		
5	ALUMINIUM ALLOY RIVET MATERIAL AND MISCELLANEOUS											
—	Al RIVET	>9·52	>21,330	—	—	>2	—	—	—	L 36 AN-QQ-W-298	—	〒082
—	D RIVET	>24·13	>54,050	—	—	>16	—	—	L 37 AN-QQ-W-298	—	—	〒281
—	MILD D RIVET	>16·50	>36970	—	—	>20	—	—	DTD 327 AN-QQ-W-298	—	—	〒181
—	Hy RIVET	>15·88	>35,600	—	—	>25	—	—	DTD 303 AN-QQ-W-298	—	—	〒481
—	E. S. D	—	—	—	—	—	—	—	—	DTD 363	—	—
—	H. D	—	—	—	—	—	—	—	—	DTD 683	—	—

6 ALUMINIUM ALLOY CASTING

Nº	NAME		TENSILE STRENGTH		ELONGATION IN 2"	HARDNESS		BRITISH AND/OR AMERICAN SPECIFICATION EQUIVALENT			JAPANESE CODE NUMBER
			TONS PER SQ.IN	POUNDS PER SQ. IN.	%	BRINELL	ROCKWELL	OVERALL	CHEMICAL	PHYSICAL	
—	Al-Cu	(a) Nº 195	>9·52	>21,330	> 5	—	—	AN-QQ-A-	—	—	—
								390			
—			>16 50	>36,970	>3	>70	>B34	QQ-A-601	—	—	—
								CLASS 4			
								CONDITION HT3			
—		(b) L 8	>11·43	>25,620	>1	—	—	—	L 8	—	—
—		(c) Nº 12	> 8·89	>19,920	>3	—	—	—	L11	—	—
—	Al-Cu-Si	H S A	>10·17	>22,780	>2	—	—	DTD 424	—	—	千 502 甲
—		LAUTAL	>17 78	>39,850	>1	>85	>B50	—	—	DTD 304	千 502 乙
—	Al-Cu-Ni	(a) "Y" ALLOY	>11 43	>25,620	—	>65	>B19	—	L24	—	—
—			>17 78	>39,850	—	>95	>B57	—	L35	—	—
—		(b) RR 50	>11 43	>25,620	>3	>70	>B34	—	DTD 133	—	—
—			>12·70	>28,450	>2	>75	>B42	—	DTD 133	—	—
—		(c) RR 53	>11 43	>25,620	—	>75	>B42	—	DTD 238	—	—
—			>17 78	>39,850	—	130-150	B74-B81	DTD 131	—	—	—
—	Al-Si	(a) SILUMIN	>11 43	>25,620	>4	—	—	L 33	—	—	—
—		(b) 26 G,	>11 43	>25,620	>3	—	—	—	—	—	—
—		Y SILUMIN	>15·88	>35,600	>2	>85	>B50	—	—	—	—
—		(c) Zn SILUMIN	>12 07	>27,000	>4	—	—	—	—	—	—
—	Al-Mg	(a) Hy, SA2	>11 43	>25,620	>5	>70	>B34	—	—	—	—
—		(b) PANTAL,	>9·52	>21,330	>1·5	>60	>B11	—	—	—	—
—		ANTICORODAL	>15·88	>35,600	>1	>90	>B53	—	—	—	—
—		(c) TI SEEWASSER	>10·17	>22,780	>2	>60	>B11	—	—	—	—
—		(KS SEEWASSER)	>15·88	>35,600	>1	>80	>B45	—	—	—	—

Nº	NAME		TENSILE STRENGTH		ELONGATION IN 2" %	BRITISH AND/OR AMERICAN SPECIFICATION EQUIVALENT			JAPANESE CODE NUMBER
			TONS PER SQ. IN.	POUNDS PER SQ. IN.		OVERALL	CHEMICAL	PHYSICAL	
1	MAGNESIUM ALLOY CASTING								
—	CLASS 1 CASTING		>11·43	>25,620	> 5	AN-QQ-M-56 CONDITION A0	—	—	—
—	CLASS 2 CASTING		>9·52	>21,330	>1	—	DTD 136	—	) 502 Φ
			>13·33	>29,870	>1	DTD 281	—	—	) 502 Z
—	DIE CASTING		>9·52	>21, 330	>1	AN-M-16 CONDITION HT			) 601
2	MAGNESIUM ALLOY SHEET, BAR, FORGING AND EXTRUSION								
	CLASS 1	SHEET	>15·88	>35,600	>8	—	AN-M-28	—	) 223
		BAR, FORGING	>15·88	>35,600	>8	—	AN-M-20	—	—
		EXTRUSION.	>13·97	>31,280	>8	—	AN-M 24	—	—
	CLASS 3	SHEET	>12·70	>28,450	>3	—	DTD118, AN-M-30	—	—
		BAR, FORGING	>12·70	>28,450	>2	—	AN-M-22	—	—
		EXTRUSION	>11·43	>25,620	>2	—	DTD 142, AN-M-26	—	) 202

No.	NAME	TENSILE STRENGTH		ELONGATION IN 2" %	BRITISH AND/OR AMERICAN SPECIFICATION EQUIVALENT			JAPANESE CODE NUMBER
		TONS PER SQ. IN.	POUNDS PER SQ. IN		OVERALL	CHEMICAL	PHYSCIAL	
1	SPECIAL BRASS							
—	NAVAL BRASS	> 22·23	> 49,800	> 20	BSS 251	——	——	H 101
—	HIGH STRENGTH BRASS (Mn BRONZE)	38·1 - 41·2	85,000-92,300	> 18	——	QQ-B-721 CLASS B	——	——
		31 7 - 34·9	71,000-76,900	> 18	BSS 1002	——	——	——
2	PHOSPHOR BRONZE							
1	ROLLED FORGED	> 29·8	> 66,500	> 15	BSS 369	——	——	H 201
	EXTRUDED, DRAWN	> 29·8	> 66,500	> 15	——	——	——	H 201
2	ROLLED SHEET	> 41·2	> 92,300	> 7	——	BSS 407 GRADE 3	——	H 211
	EXTRUDED WIRE	> 55·2	>123,700	——	BSS 384	——	——	H 231
3	CASTING	> 9·52	> 21,330	>1·5	B 8	——	——	H 245
3	BEARING METAL							
—	HOYT Nº 11	——	——	——	——	B 22 QQ-M-161 GRADE 1	——	——
—	YAMATO METAL	5·56	12,470	——	——	B22, QQ-M-161 GRADE 1	——	——
—	ISODA METAL	5 08	11,380	11·5	——	——	——	——
—		5 72	12,820	——	——	——	——	——