



RUSSIAN MARITIME REGISTER OF SHIPPING

CIRCULAR LETTER

No. 314-04-1610c

dated 10.08.2021

Re:

amendments to the Rules for the Classification and Construction of Sea-Going Ships; and Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships

Item(s) of supervision:

ships under construction, equipment, arrangements and products

Entry-into-force date¹:

From the date of publication

~~Cancels / amends / adds Circular Letter No~~

~~dated~~

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Appendices:

Appendix 1: information on amendments introduced by the Circular Letter

Appendix 2: text of amendments to Parts XIII "Materials" and XIV "Welding" of the Rules for the Classification and Construction of Sea-Going Ships and Part III "Technical Supervision during Manufacture of Materials" of the Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships

Director General

Konstantin G. Palnikov

Text of CL:

We hereby inform that the Rules for the Classification and Construction of Sea-Going Ships shall be amended as specified in the Appendices to the Circular Letter

It is necessary to do the following:

1. Bring the content of the Circular Letter to the notice of the RS surveyors, as well as interested organizations and persons in the area of the RS Branch Offices' activity.
2. Apply the provisions of the Circular Letter during review and approval of the technical documentation on ships, equipment, equipment, arrangements and products requested for review on or after 10.08.2021.

List of the amended and/or introduced paras/chapters/sections:

Rules for the Classification and Construction of Sea-Going Ships:

Part XIII: paras 5.1.1.1 and 5.1.1.2, Tables 5.1.2, 5.1.3-1 and 5.1.3-2

Part XIV: Tables 2.2.7-1, 2.2.7-2 and 4.9.1.3-2, para 4.9.3.6 and Table 4.9.3.6

Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships:

Part III: Tables 4.4.5.4-2, 7.2.2 and 7.4.2.2

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¹ Service remarks (*delete as appropriate*): ~~contains / does not contain mandatory international/national requirements~~
~~Urgent implementation is required.~~

**Information on amendments introduced by the Circular Letter
(for inclusion in the Revision History to the RS Publication)**

Nos.	Amended paras/chapters/sections	Information on amendments	Number and date of the Circular Letter	Entry-into-force date
1	Rules for the Classification and Construction of Sea-Going Ships, Part XIII, paras 5.1.1.1 and 5.1.1.2	Paras have been supplemented with requirements for new aluminum alloy 1581	314-04-1610c of 10.08.2021	10.08.2021
2	Rules for the Classification and Construction of Sea-Going Ships, Part XIII, Table 5.1.2	Table has been supplemented with requirements have been introduced for new aluminum alloy 1581	314-04-1610c of 10.08.2021	10.08.2021
3	Rules for the Classification and Construction of Sea-Going Ships, Part XIII, Table 5.1.3-1	Table has been supplemented with requirements have been introduced for new aluminum alloy 1581	314-04-1610c of 10.08.2021	10.08.2021
4	Rules for the Classification and Construction of Sea-Going Ships, Part XIII, Table 5.1.3-2	Table has been supplemented with requirements have been introduced for new aluminum alloy 1581	314-04-1610c of 10.08.2021	10.08.2021
5	Rules for the Classification and Construction of Sea-Going Ships, Part XIV, Table 2.2.7-1	Table has been supplemented with requirements have been introduced for new aluminum alloy 1581	314-04-1610c of 10.08.2021	10.08.2021
6	Rules for the Classification and Construction of Sea-Going Ships, Part XIV, Table 2.2.7-2	Table has been supplemented with requirements have been introduced for new aluminum alloy 1581	314-04-1610c of 10.08.2021	10.08.2021
7	Rules for the Classification and Construction of Sea-Going Ships, Part XIV, Table 4.9.1.3-2	Table has been supplemented with requirements have been introduced for new aluminum alloy 1581	314-04-1610c of 10.08.2021	10.08.2021
8	Rules for the Classification and Construction of Sea-Going Ships, Part XIV, para 4.9.3.6	Requirements for examination of macrosections have been specified	314-04-1610c of 10.08.2021	10.08.2021
9	Rules for the Classification and Construction of Sea-Going Ships, Part XIV, Table 4.9.3.6	Table has been supplemented with requirements have been introduced for new aluminum alloy 1581	314-04-1610c of 10.08.2021	10.08.2021

Nos.	Amended paras/chapters/sections	Information on amendments	Number and date of the Circular Letter	Entry-into-force date
10	Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships, Part III, Table 4.4.5.4-2	Table has been supplemented with requirements have been introduced for new aluminum alloy 1581 during welder qualification test and welding procedure approval	314-04-1610c of 10.08.2021	10.08.2021
11	Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships, Part III, Table 7.2.2	Classification of a new aluminum alloy 1581 has been introduced	314-04-1610c of 10.08.2021	10.08.2021
12	Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships, Part III, Table 7.4.2.2	Table has been supplemented with requirements have been introduced for new aluminum alloy 1581 during welder qualification test and welding procedure approval	314-04-1610c of 10.08.2021	10.08.2021

**RULES FOR THE CLASSIFICATION AND CONSTRUCTION
OF SEA-GOING SHIPS, 2021,**

ND No. 2-020101-124-E

PART XIII. MATERIALS

3 STEEL AND CAST IRON

1 **Paras 5.1.1.1 and 5.1.1.2** are replaced by the following text:

.1 rolled products (plates, strips and sheets): 5083, 5086, 5383, 5059, 5754, 5456;
temper conditions: O/H111/H112/H116/H321;

national alloys: 1530, 1550, 1561, 1561H, 1565ч, 1575, 1581;
temper conditions: O/H111/H112, H321;

.2 pressed sections (full sections, hollow sections, panels, angles and bars etc.): 5083, 5383, 5059, 5086;

temper conditions: O, H111, H112 и 6005A, 6061, 6082;

temper conditions: T5, T6;

national alloys: 1530, 1550, 1561, 1561H, 1565ч, 1575, 1581;

temper conditions: O/H111/H112.

Alloys 6005A, 6061 and 6000 series shall not be used in direct contact with sea water unless protected by anodes and/or coating system."

5 ALUMINIUM ALLOYS

2 **Table 5.1.2** is replaced by the following text:

"Table 5.1.2

Chemical composition

Grade	Al, %	Si, %	Fe, %	Cu, %	Mn, %	Mg, %	Cr, %	Zn, %	Ti, %	Other elements, %		Note
										Each	Total ¹	
5083	Base	≤ 0,40	≤ 0,40	≤ 0,10	0,40 – 1,0	4,0 – 4,9	0,05 – 0,25	≤ 0,25	≤ 0,15	≤ 0,05	≤ 0,15	
5383	Base	≤ 0,25	≤ 0,25	≤ 0,20	0,7 – 1,0	4,0 – 5,2	≤ 0,25	≤ 0,40	≤ 0,15	≤ 0,05 ²	≤ 0,15 ²	
5059	Base	≤ 0,45	≤ 0,50	≤ 0,25	0,6 – 1,2	5,0 – 6,0	≤ 0,25	0,4 – 0,9	≤ 0,20	≤ 0,05 ³	≤ 0,15 ³	
5086	Base	≤ 0,40	≤ 0,50	≤ 0,10	0,20 – 0,7	3,5 – 4,5	0,05 – 0,25	≤ 0,25	≤ 0,15	≤ 0,05	≤ 0,15	
5754	Base	≤ 0,40	≤ 0,40	≤ 0,10	≤ 0,50 ⁴	2,6 – 3,6	≤ 0,30	≤ 0,20	≤ 0,15	≤ 0,05	≤ 0,15	
5456	Base	≤ 0,25	≤ 0,40	≤ 0,10	0,5 – 1,0	4,7 – 5,5	0,05 – 0,20	≤ 0,25	≤ 0,20	≤ 0,05	≤ 0,15	
6005A	Base	0,50 – 0,90	≤ 0,35	≤ 0,30	≤ 0,50 ⁵	0,4 – 0,7	≤ 0,30 ⁵	≤ 0,20	≤ 0,10	≤ 0,05	≤ 0,15	
6061	Base	0,40 – 0,80	≤ 0,70	0,15 – 0,40	≤ 0,15	0,8 – 1,2	0,04 – 0,35	≤ 0,25	≤ 0,15	≤ 0,05	≤ 0,15	
6082	Base	0,70 – 1,30	≤ 0,50	≤ 0,10	0,4 – 1,0	0,6 – 1,2	≤ 0,25	≤ 0,20	≤ 0,10	≤ 0,05	≤ 0,15	
National alloys												
1530	Base	0,50 – 0,80	≤ 0,50	≤ 0,10	0,30 – 0,60	3,2 – 3,8	≤ 0,05	≤ 0,20	≤ 0,10	≤ 0,05	≤ 0,15	–
1550	Base	≤ 0,50	≤ 0,50	≤ 0,10	0,30 – 0,80	4,8 – 5,8	–	≤ 0,20	≤ 0,10	≤ 0,05	≤ 0,15	–
1561	Base	≤ 0,40	≤ 0,40	≤ 0,10	0,70 – 1,10	5,5 – 6,5	–	≤ 0,20	–	≤ 0,05	≤ 0,15	Zr (0,02 – 0,12)
1561H	Base	≤ 0,40	≤ 0,40	≤ 0,10	0,5 – 0,8	5,5 – 6,5	–	≤ 0,20	–	≤ 0,05	≤ 0,15	Zr (0,10 – 0,17)
1565ч	Base	≤ 0,20	≤ 0,3 ⁶	0,05 – 0,1	0,4 – 1,2	5,1 – 6,2 ⁷	0,02 – 0,25	0,45 – 1	≤ 0,10	≤ 0,05	≤ 0,15	Zr (0,08 – 0,13) Ni (0,05)
1575	Base	≤ 0,20	≤ 0,30	≤ 0,10	0,35 – 0,6	5,4 – 6,4	0,05 – 0,15	≤ 0,01	≤ 0,07	≤ 0,05	≤ 0,15	Zr (0,1 – 0,1)
1581	Base	0,08 – 0,16	0,12 – 0,22	≤ 0,10	0,40 – 0,80	4,30 – 5,30	0,08 – 0,18	≤ 0,25	0,02 – 0,15	≤ 0,05	≤ 0,15	Zr (0,08 – 0,16) Sc (0,01 – 0,09) Ca (≤ 0,10) V (0,01 – 0,06)

¹ Including Ni, Ga, V and other elements not given here.

² Zr: maximum 0,20. The total for other elements does not include Zirconium.

³ Zr: 0,05 – 0,25. The total for other elements does not include Zirconium.

⁴ Mn + Cr : 0,10 – 0,6.

⁵ Mn + Cr : 0,12 – 0,5.

⁶ Fe + Ni: ≤ 0,7.

⁷ Mg + Zn: 5,7 – 7,3

3 Table 5.1.3-1 is replaced by the following text:

"Table 5.1.3-1

Mechanical properties for rolled products

Grade	Temper condition	Thickness t , mm	Yield stress $R_{p0,2}$, MPa, min.	Tensile strength R_m , MPa, min.	Elongation, % min.	
					A_{50} mm	A_{5d}
5083	O	$3 \leq t \leq 50$	125	275 – 350	16	14
	H111		125	275 – 350	16	14
	H112		125	275	12	10
	H116		215	305	10	10
	H321		215 – 295	305 – 385	12	10
5383	O	$3 \leq t \leq 50$	145	290	–	17
	H111		145	290	–	17
	H116		220	305	10	10
	H321		220	305	10	10
5059	O	$3 \leq t \leq 50$	160	330	24	24
	H111	$3 \leq t \leq 50$	160	330	24	24
	H116	$3 \leq t \leq 50$	270	370	10	10
		$20 \leq t \leq 50$	260	360	–	10
	H321	$3 \leq t \leq 20$	270	370	10	10
		$20 \leq t \leq 50$	260	360	–	10
5086	O	$3 \leq t \leq 50$	95	240 – 305	16	14
	H111		95	240 – 305	16	14
	H112	$3 \leq t \leq 12,5$	125	250	8	–
		$12,5 \leq t \leq 50$	105	240	–	9
	H116	$3 \leq t \leq 50$	195	275	10 ¹⁾	9
5754	O	$3 \leq t \leq 50$	80	190 – 240	18	17
	H111		80	190 – 240	18	17
5456	O	$3 \leq t \leq 6,3$	130 – 205	290 – 365	16	–
		$6,3 \leq t \leq 50$	125 – 205	285 – 360	16	14
	H116	$3 \leq t \leq 30$	230	315	10	10
		$30 \leq t \leq 40$	215	305	–	10
		$40 \leq t \leq 50$	200	285	–	10
	H321	$3 \leq t \leq 12,5$	230 – 315	315 – 405	12	–
		$12,5 \leq t \leq 40$	215 – 305	305 – 385	–	10
		$40 \leq t \leq 50$	200 – 295	285 – 370	–	10
National alloys						
1530	O/H112	$3 \leq t \leq 12,5$	80	185	15	–
		$12,5 \leq t \leq 50$	60	165	–	11
1550	O/H112	$3 \leq t \leq 12,5$	125	275	15	–
		$12,5 \leq t \leq 50$	110	255	–	12
1561	O/H112	$3 \leq t \leq 12,5$	175	335	12	–
		$12,5 \leq t \leq 50$	175	335	–	10
1561H	H32/H321	$3 \leq t \leq 12,5$	245	355	10	–
		$12,5 \leq t \leq 50$	225	335	–	12
15654	O/H112	$2 \leq t \leq 4$	145	330	–	18
		5	170	330		15
		$5,5 \leq t \leq 10,5$	175	335		15
		$11,0 \leq t \leq 40,0$	175	335		15
		$40 \leq t \leq 60$	175	330		15
		$60 \leq t \leq 80$	170	310		12
1575	O/H112	$3 \leq t \leq 12,5$	295	400	11	–
1581	O/H112	$1,5 \leq t \leq 6,0$	205	345	–	15
		$6 < t \leq 10,5$	200	350		15
		$10,5 < t \leq 50,0$	190	350		14

¹⁾ 8 % for thicknesses up to and including 6,3 mm.

Notes : 1. The values in the Table are applicable for longitudinal and transverse specimens as well.

2. The mechanical properties for the O and H111 tempers are the same. However, they are separated to discourage dual certification as these tempers represent different processing.

4 Table 5.1.3-2 is replaced by the following text:

"Table 5.1.3-2

Mechanical properties for extruded products

Grade	Temper condition	Thickness t , mm	Yield stress $R_{p0,2}$, MPa, min.	Tensile strength R_m , MPa, min.	Elongation, % min.	
					A_{50} mm	A_{5d}
5083	O		110	270 – 350	14	12
	H111	$3 \leq t \leq 50$	165	275	12	10
	H112		110	270	12	10
5383	O		145	290	17	17
	H111	$3 \leq t \leq 50$	145	290	17	17
	H112		190	310		13
5059	H112	$3 \leq t \leq 50$	200	330		10
5086	O		95	240 – 315	14	12
	H111	$3 \leq t \leq 50$	145	250	12	10
	H112		95	240	12	10
6005A	T5	$3 \leq t \leq 50$	215	260	9	8
	T6	$3 \leq t \leq 10$	215	260	8	6
		$10 \leq t \leq 50$	200	250	8	6
6061	T6	$3 \leq t \leq 50$	240	260	10	8
6082	T5	$3 \leq t \leq 50$	230	270	8	6
	T6	$3 \leq t \leq 5$	250	290	6	
		$5 \leq t \leq 50$	260	310	10	8
National alloys ¹⁾						
1530	O/H111/H112	$3 \leq t \leq 12,5$	80	175	12	–
		$12,5 \leq t \leq 50$			–	12
1550	O/H111/H112	$3 \leq t \leq 12,5$	125	255	13	–
		$12,5 \leq t \leq 50$			–	13
1561	O/H111/H112	$3 \leq t \leq 12,5$	205	335	11	–
		$12,5 \leq t \leq 50$			–	11
1565ч	O/H112	$3 \leq t \leq 12,5$	185	335		12
		$5,5 \leq t \leq 50$	185	335		12
1575	O/H111/H112	$3 \leq t \leq 12,5$	295	400	11	–
		$12,5 \leq t \leq 50$			–	11
1581	O/H112	All thicknesses	215	355	–	12
¹⁾ The mechanical properties specified for national alloys also cover hollow sections made of these alloys if their crosssection does not exceed 60 mm ² or the diameter of a circumscribed circle is equal or less than 250 mm.						
Note . The values in the Table are applicable for longitudinal and transverse specimens as well.						

RULES FOR THE CLASSIFICATION AND CONSTRUCTION OF SEA-GOING SHIPS, 2021,

ND No. 2-020101-138-E

PART XIV. WELDING

2 TECHNOLOGICAL REQUIREMENTS FOR WELDING

5 **Table 2.2.7-1** is replaced by the following text:

"Table 2.2.7-2

Grade of welding consumable	Hull structural aluminium alloys												
	International						National						
	5754	5086	5083	5383, 5456	5059	6061, 6005A, 6082	1530	1550	1561	15654	1575	(AlSiMgMn)	1581
RAWA (5754)	+	-	-	-	-	-	+	-	-	-	-	-	-
RBWB (5086)	+	+	-	-	-	-	+	-	-	-	-	-	-
RCWC (5083)	+	+	+	-	-	+	+	+	-	-	-	+	-
RCWC (5383)	+	+	+	+	-	+	+	+	-	-	-	+	-
RCWC (5456)	+	+	+	+	-	+	+	+	-	-	-	+	-
RCWC (5059)	+	+	+	+	+	+	+	+	+	+	-	+	+
RDWD (6061)	-	-	-	-	-	+	-	-	-	-	-	+	-
RDWD (6005A)	-	-	-	-	-	+	-	-	-	-	-	+	-
RDWD (6082)	-	-	-	-	-	+	-	-	-	-	-	+	-
R1/W1 (1530)	+	-	-	-	-	-	+	-	-	-	-	-	-
R2/W2 (1550)	+	+	+	-	-	+	+	+	-	-	-	+	-
R3/W3 (1561)	+	+	+	+	+	+	+	+	+	+	-	+	+
R3/W3 (15654)	+	+	+	+	+	+	+	+	+	+	-	+	+
R3/W3 (1581)	+	+	+	+	+	+	+	+	+	+	+	+	+
R4/W4 (15654)	-	-	-	-	-	-	-	-	+	+	+	+	+
R4/W4 (1575)	-	-	-	-	+	-	-	-	+	+	+	-	+
R4/W4 (1581)	-	-	-	-	-	-	-	-	+	+	+	+	+
R5/W5 (AlSiMgMn)	-	-	-	-	-	+	-	-	-	-	-	+	-

"

6 **Table 2.2.7-2** is replaced by the following text:

"Table 2.2.7-2

Brand of welding consumable		Hull structural aluminium alloys												
		International						National						
Designation	Code of chemical composition	5754	5086	5083	5383, 5456	5059	6061, 6005A, 6082	1530	1550	1561	1565ч	1575	(AlSiMgMn)	1581
International materials ¹														
–	AlMg3	+	–	–	–	–	–	+	–	–	–	–	–	–
5356	AlMg5	+	+	+	–	–	+	+	+	–	–	–	+	+
5183	AlMg4,5Mn	+	+	+	+	–	+	+	+	–	–	–	+	+
–	AlMg6Mn1	+	+	+	+	+	+	+	+	+	–	–	+	+
National materials ²														
СвАМr3	AlMg3	+	–	–	–	–	–	+	–	–	–	–	–	–
СвАМr5	AlMg5	+	+	+	–	+	+	+	+	–	–	–	+	+
СвАМr61	AlMg6Mn1	+	+	+	+	+	+	+	+	+	+	–	+	+
Св01597	–	–	–	–	–	+	–	–	–	+	+	+	–	+

¹ Designations of the most common filler materials for welding international aluminium alloys (welding processes 141 = TIG and 131 = MIG) in accordance with ISO 18273:2015.

² Designations of welding wire brands for welding national aluminium alloys used in shipbuilding in accordance with the Russian standard GOST 7871:2019 (welding processes 141 = TIG and 131 = MIG).

4 WELDING CONSUMABLES

7 **Table 4.9.1.3-2** is replaced by the following text:

"Table 4.9.1.3-2

Grades of welding consumables for national aluminium alloys

Grade	Base metal for tests and alloy designation	
	Numerical code	Chemical symbol
R1/W1	1530	AlMg3,5Si0,6
R2/W2	1550	AlMg5,0Mn0,6
R3/W3	1561	AlMg6,0Mn1
R3/W3	1565ч	AlMg6,0Mn1
R3/W3	1581	AlMg5Sc0,03
R4/W4	1565ч	AlMg6,0Mn1
R4/W4	1575	AlMg6,0Mn0,5Sc
R4/W4	1581	AlMg5Sc0,03
R5/W5	–	AlSiMgMn

Note. Approval of higher strength AlMg base materials also covers the lower strength AlMg grades and their combinations.

8 **Para 4.9.3.6** is replaced by the following text:

"4.9.3.6 The mechanical properties of butt welded joints shall meet the requirements in Table 4.9.3.6. The test procedure and results evaluation, including repeated and annual tests, shall comply with the relevant requirements in 4.2. The position of a fracture on tensile test specimens shall be recorded in a test report. The macrosections shall be examined for defects such as a lack of fusion, cavities, inclusions, pores or cracks. At that the bending tests are performed with the "wrap around bending method" as shown in Fig. 4.9.3.6."

9 **Table 4.9.3.6** is replaced by the following text:

"Table 4.9.3.6

Requirements for mechanical properties of butt welded joints

Grade of welding consumable	Numerical code of base metal for testing	Tensile strength R_m , MPa	Bend test	
			Mandrel diameter D^1	Bend angle ² , deg.
International alloys				
RA/WA	5754	190	3t	180

Grade of welding consumable	Numerical code of base metal for testing	Tensile strength R_m , MPa	Bend test	
			Mandrel diameter D^1	Bend angle ² , deg.
RB/WB	5086	240	$6t$	
RC/WC	5083	275	$6t$	
	5383 или 5456	290	$6t$	
	5059	330	$6t$	
RD/WC	6061, 6005A or 6082	170	$6t$	
National alloys				
R1/W1	1530	185 ^{3,4}	$6t$	180
R2/W2	1550	275 ^{3,4}	$6t$	
R3/W3	1561	305 ^{3,4} / 335 ^{3, 5}	$6t$	
R3/W3	1565ч	305 ^{3,4} / 335 ^{3, 5}	$6t$	
R3/W3	1581	320 ⁴ / 355 ⁵	$6t$	
R4/W4	1565ч	335 ^{3,4}	$6t$	
R4/W4	1575	360 ⁴ / 400 ⁵	$6t$	
R4/W4	1581	355 ⁴	$6t$	
R5/W5	(AlSiMgMn)	170	$6t$	
¹ t — specimen thickness during test. ² When evaluating the test results, one should be guided by the following: no any single crack of over 3 mm long in any direction is allowed on the specimen surface; cracks at the corners of a test specimen may be ignored in the evaluation, unless there is evidence that they result from lack of fusion. ³ For welded joints of up to 12,5 mm thick inclusive. ⁴ For tensile testing of transverse flat tensile test specimens with weld reinforcement removed. ⁵ For tensile testing of transverse flat tensile test specimens with reinforcement complying with international and national standards.				

**RULES FOR TECHNICAL SUPERVISION DURING CONSTRUCTION OF SHIPS
AND MANUFACTURE OF MATERIALS AND PRODUCTS FOR SHIPS, 2021,**

ND No. 2-020101-139-E

PART III. TECHNICAL SUPERVISION DURING MANUFACTURE OF MATERIALS

4 WELDING. REGULATIONS FOR WELDERS' CERTIFICATION

10 **Table 4.4.5.4-2** is replaced by the following text:

"Table 4.4.5.4-2

Requirements for static bend test performance for shipbuilding aluminum alloys

Grade of aluminum alloy	Proportion d/t_s as for delivery condition				Bend angle, in deg
	O/H111	H112; H116; H32; H34; H36	T4	T5; T6	
International alloys					
5754	3	4	–	–	180
5086; 5083; 5383; 5456; 5059	6	6	–	–	180
6005A; 6061; 6082	4	–	6	7	180
National alloys					
1530	3	4	–	–	180
1550; 1561; 1565ч; 1575, 1581	6	6	–	–	180

7 APPROVAL OF WELDING PROCEDURES FOR ALUMINIUM ALLOYS

11 **Table 7.2.2** is replaced by the following text:

"Table 7.2.2

**Classification of international shipbuilding aluminium alloys by type composition groups
according to ISO/TR 15608**

Group	Subgroup	Type of alloy/characteristic	Typical specimen
21	–	Pure aluminium with admixtures or alloying elements content up to 1 % including	1050A[Al 99,5] 1200[Al 99,0]
22	Non-hardenable alloys		
	22.1	Aluminium-magnesium alloys	3103 [AlMn 1]
	22.2	Aluminium-magnesium alloys with Mg content $Mg \leq 1,5 \%$	5005 [AlMg 1(B)] 5050 [AlMg 1,5(C)]
	22.3	Aluminium-magnesium alloys with Mg content $1,5 \% < Mg \leq 3,5 \%$	5251 [AlMg2] 5052 [AlMg2,5] 5754, 1530 [AlMg3]* 5154 [AlMg3,5]
	22.4	Aluminium-magnesium alloys with Mg content $Mg > 3,5 \%$	5086 [AlMg4]* 5083 [AlMg4,5Mn0,7]* 5383 [AlMg4,5Mn0,9]* 5456, 1550 [AlMg5]* 5059[–]* 1561, 1565ч [AlMg6Mn1] 1575[AlMg6Mn0,5Sc] 1581 [AlMg5Sc0,03]
23	Hardenable alloys		
	23.1	Al-Mg-Si alloys	6060[AlMgSi] 6063[AlMg0,7Si] 6005A[AlSiMg(A)]* 6082[AlSi1MgMn]* 6061[AlMg1SiCu]*
	23.2	Al-Zn-Mg alloys	7075[AlZn6MgCu1,5]

24	Алюминиево-кремниевые сплавы с содержанием Cu ≤ 1 %		
	24.2	Al-Si alloys with Cu content Cu ≤ 1 %, 5 % < Si ≤ 15 % and 0,1 % < Mg ≤ 0,80 %	42100[AlSi7Mg0,3] 42200[AlSi7Mg0,6] 43100[AlSi10Mg(b)] 44100[AlSi12(b)]
* Marks shipbuilding aluminium alloys covered by the classification of Section 5, Part XIII "Materials" of the Rules for the Classification and Construction of Sea-Going Ships.			

12 Table 7.4.2.2 is replaced by the following text:

"Table 7.4.2.2

Base metal		Grade of welding consumable	Properties of welded joints (at least)		
Grade	Condition of supply		Tensile strength	Static bend ¹	
			R_m , MPa	Ratio d/t_s^2	Bend angle, in deg.
International alloys					
5754	O, F, H111, H24	RA/WA	190	4	180
5086	O, F, H111, H116, H32, H34	RB/WB	240	6	180
5083	O, F, H116, H321	RC/WC	270	6	180
5383,5456	O, H111, H116, H321	RC/WC	290	6	180
5059	O, H111, H116, H321	RC/WC	330	6	180
6005A	T5, T6	RD/WD	165	7	180
6061	T4	RD/WD	165	6	180
	T5, T6	RD/WD	165	7	180
6082	T4	RD/WD	170	6	180
	T5, T6	RD/WD	170	7	180
National alloys					
1530	O, H111, H112,	R1/W1			
	$t_s \leq 12,5$ mm		185	4	180
	$t_s > 12,5$ mm		165	4	180
1550	O, H111, H112,	R2/W2			
	$t_s \leq 12,5$ mm		275	6	180
	$t_s > 12,5$ mm		255	6	180
1561	O, H111, H112,	R3/W3	305	6	180
1565ч	O, H112	R3/W3	305	6	180
		R4/W4	335	6	180
1561H	H32, H321	R3/W3	305	6	180
1575	O, H111, H112	R4/W4	360	6	180
1581	O, H112	R3/W3	320	6	180
		R4/W4	355	6	180
[AlSi1MgMn]	T5, T6	R5/W5	165	7	180
¹ At assessment of the test results the following shall be taken into consideration: after the specimen bending through the required angle, no defects more than 3 mm in length shall appear on its surface; defects on the specimen edges may be neglected if they were not caused by poor fusion. ² Symbols: d — diameter of punch or inner roller, in mm; t_s — bend test specimen thickness, in mm.					