

1. | STANDARDS OF MECHANICAL PROPERTIES

The standard mechanical properties listed below have been taken from

- EN 485 – 2: Aluminium and aluminium alloys – Sheet, strip and plate – Part 2: Mechanical properties
- EN 1386: Aluminium and aluminium alloys – Tread plate, Specifications
- EN 755 – 2: Extruded rod/bar, tube and profiles – Mechanical properties

ALLOY 5454										
Semi Products	Temper	Dimension (mm) Diameter D Thickness t Width across flats C	Rm (MPa)		Rp _{0,2} (MPa)		A% min		Folding radius	
			min	max	min	max	A ₅₀	A	180 °	90 °
Sheet and Plate	O – H111	3,0 < t ≤ 6,0	215	275	85		17			1,5 t
		6,0 < t ≤ 12,5	215	275	85		18			2,5 t
		12,5 < t ≤ 80	215	275	85			16		
	H24 – H34	3,0 < t ≤ 6,0	270	325	200		7			3,0 t
		6,0 < t ≤ 12,5	270	325	200		5			4,0 t
		12,5 < t ≤ 25,0	270	325	200			7		
Extruded Profile	F/H112	t ≤ 25	200		85		16	14		
Extruded Tube	F/H112	t ≤ 25	200		85		16	14		
	O/H111	t ≤ 25	200	275	85		18	15		
Extruded Bar	F/H112	D ≤ 200	200		85		16	14		
		C ≤ 200	200		85		16	14		
	O/H111	D ≤ 200	200	275	85		18	16		
		C ≤ 200	200	275	85		18	16		

Table I

ALLOY 5754										
Semi Products	Temper	Dimension (mm)	Rm (MPa)		Rp _{0,2} (MPa)		A% min		Folding radius	
		Diameter D Thickness t Width across flats C	min	max	min	max	A ₅₀	A	180 °	90 °
Sheet and Plate	O / H111	3,0 < t ≤ 6,0	190	240	80		18		1,0 t	1,0 t
		6,0 < t ≤ 12,5	190	240	80		18			2,0 t
		12,5 < t ≤ 100	190	240	80		17			
	H24 – H34	3,0 < t ≤ 6,0	240	280			8			2,5 t
		6,0 < t ≤ 12,5	240	280			10			3,0 t
		12,5 < t ≤ 25	240	280				8		
Tread Plate	H114	1,5 < t ≤ 3,0	190	260	80		10			
		3,0 < t ≤ 6,0	190	260	80		12			2,0 t
		6,0 < t ≤ 20	190	260	80		14	15		2,0 t
Extruded Profile	F/H112	t ≤ 25	180		80		14	12		
Extruded Tube	F/H112	t ≤ 25	180		80		14	12		
	O/H111	t ≤ 25	180	50	80		17	15		
Extruded Bar	F/H112	D ≤ 150	180		80		14	12		
		150 < D ≤ 200	180		70		13			
		C ≤ 150	180		80		14	12		
		150 < C ≤ 200	180		70		13			
	O/H111	D ≤ 150	180	250	80		17	15		
		C ≤ 150	180	250	80		17	15		

Table II

ALLOY 5086

Semi Products	Temper	Dimension (mm) Diameter D Thickness t Width across flats C	Rm (MPa)		Rp _{0,2} (MPa)		A% min		Folding radius	
			min	max	min	max	A ₅₀	A	180 °	90 °
Sheet and Plate	O / H111	3,0 < t ≤ 6,0	240	310	100		15		1,5 t	1,5 t
		6,0 < t ≤ 12,5	240	310	100		17			
		12,5 < t ≤ 150	240	310	100			16		
	H116	3,0 < t ≤ 6,0	275		195		9			2,5 t
		6,0 < t ≤ 12,5	275		195		10			
		12,5 < t ≤ 50	275		195			9		
	H24 – H34	3,0 < t ≤ 6,0	300	360	220					3,5 t
		6,0 < t ≤ 12,5	300	360	220					
		12,5 < t ≤ 25,0	300	360	220					
Tread Plate	H114	1,5 < t ≤ 3,0	240	310	100		8			2,0 t
		3,0 < t ≤ 6,0	240	310	100		10			
		6,0 < t ≤ 20,0	240	310	100		12	16		
	H116	1,5 < t ≤ 3,0	275		195		4			4,0 t
		3,0 < t ≤ 6,0	275		195		5			
		6,0 < t ≤ 20,0	275		195		6	9		
	H244	1,5 < t ≤ 3,0	300	360	220		2			4,5 t
		3,0 < t ≤ 6,0	300	360	220		3			
		6,0 < t ≤ 20,0	300	360	220		4	5		
Extruded Profiles	F/H112	all	240		95		10	10		
Extruded Tube	F/H112	all	240		95		12	10		
	O/H111	all	240	340	95		18	15		
Extruded Bar	F/H112	D ≤ 250	240		95		12	10		
		C ≤ 250	240		95		12	10		
	O/H111	D ≤ 250	240	320	95		18	15		
		C ≤ 200	240	320	95		18	15		

Table III

ALLOY 5083										
Semi products	Temper	Dimension (mm) Diameter D Thickness t Width across flats C	Rm (MPa)		Rp _{0,2} (MPa)		A% min		Folding radius	
			min	max	min	max	A ₅₀	A	180 °	90 °
Sheet and Plate	O / H111	3,0 < t ≤ 6,0	275	350	125		15		1,0 e	0,5 e
		6,0 < t ≤ 12,5	275	350	125		16		1,0 e	1,0 e
		12,5 < t ≤ 50,0	275	350	125			15		1,5 e
		50,0 < t ≤ 80,0	270	345	115			14		2,5 e
		80,0 < t ≤ 120,0	260		110			12		
	H116	3,0 < e ≤ 6,0	305		215		10			2,5 e
		6,0 < e ≤ 12,5	305		215		12			4,0 e
		12,5 < e ≤ 40,0	305		215			10		
40 < e ≤ 80,0		285		200			10			
Extruded Profile	F	all	270		110		12	10		
	H112	all	270		125		12	10		
Extruded tube	F	all	270		110		12	10		
	O/H111	all	270	350	110		14	12		
	O/H112	all	270		125		12	10		
Bar	F	D ≤ 250	270		110		12	10		
		200 < D ≤ 250	260		100		12			
		C ≤ 250	270		110		12	10		
		200 < C ≤ 250	260		100		12			
	O/H111	D ≤ 200	270	350	110		14	12		
		C ≤ 200	270	350	110		14	12		
	H112	D ≤ 200	270		125		12	10		
		C ≤ 200	270		125		12	10		

Table IV

ALLOY 5383

Semi products	Temper	Dimension (mm) Diameter D Thickness t Width across flats C	Rm (MPa)		Rp _{0,2} (MPa)		A% min		Folding radius	
			min	max	min	max	A ₅₀	A	180 °	90 °
Sheet and Plate	O / H111	3,0 < e ≤ 6,0	290	360	145		15			
		6,0 < e ≤ 12,5	290	360	145		16			
		12,5 < e ≤ 50,0	290	360	145			15		1,5 e
		50,0 < e ≤ 80,0	285	355	135			14		2,5 e
		80,0 < e ≤ 120,0	275		130			12		
		120,0 < e ≤ 150,0	270		125			12		
	H116 (*)	3,0 < e ≤ 6,0	305		220			10		2,5 e
		6,0 < e ≤ 12,5	305		220			12		4,0 e
		12,5 < e ≤ 40,0	305		220				10	
		40 < e ≤ 80,0	285		205				10	

(*) Sealium®

Table V

ALLOY 6060										
Semi products	Temper	Dimension (mm) Diameter D Thickness t Width across flats C	Rm (MPa)		Rp _{0,2} (MPa)		A% min		Folding radius	
			mini	maxi	mini	maxi	A ₅₀	A	180 °	90 °
Extruded Profile	T4	e ≤ 25	120		60		16	14		
	T5	e ≤ 5 5 < e ≤ 25	160		120		8	6		
			140		100		8	6		
T6	e ≤ 3 5 < e ≤ 25	190		150		8	6			
		170		140		8	6			
Extruded Tube	T4	e ≤ 15	120		60		16	14		
	T5	e ≤ 15	160		120		8	6		
	T6	e ≤ 15	190		150		8	6		
Extruded Bar	T4	D ≤ 150	120		60		16	14		
	T4	C ≤ 150	120		60		16	14		
	T5	D ≤ 150	160		120		8	6		
			160		120		8	6		
	T6	D ≤ 150	190		150		8	6		
			190		150		8	6		

Table VI

ALLOY 6005A

Semi products	Temper	Dimension (mm) Diameter D Thickness t Width across flats C	Rm (MPa)		Rp _{0,2} (MPa)		A% min		Folding radius	
			min	max	min	max	A ₅₀	A	180 °	90 °
Extruded Profile open	T4	e ≤ 25	180		90		15	13		
	T6	e ≤ 5	270		225		8	6		
		5 < e ≤ 10	260		215		8	6		
10 < e ≤ 25	250		200		8	6				
Extruded Profile hollow	T4	e ≤ 10	180		90		15	13		
	T6	e ≤ 5	255		215		8	6		
5 < e ≤ 15		250		200		8	6			
Extruded Tube	T6	e ≤ 5	270		225		8	6		
		5 < e ≤ 10	260		215		8	6		
Extruded Bar	T6	D ≤ 25	270		225		10	8		
		25 < D ≤ 50	270		225		8			
		50 < D ≤ 100	260		215		8			
		C ≤ 25	270		225		10	8		
		25 < C ≤ 50	270		225		8			
		50 < C ≤ 100	260		215		8			

Table VII

ALLOY 6063										
Semi products	Temper	Dimension (mm) Diameter D Thickness t Width across flats C	Rm (MPa)		Rp _{0,2} (MPa)		A% min		Folding radius	
			min	max	min	max	A ₅₀	A	180 °	90 °
Extruded Profile	T4	e ≤ 25	130		65		14	12		
	T5	e ≤ 3 10 < e ≤ 25	175		130		8	6		
			160		110		7	5		
T6	e ≤ 10 10 < e ≤ 25	215		170		8	6			
		195		160		8	6			
Extruded Tube	O/H111	e ≤ 25		130			18	16		
	T4	e ≤ 10 10 < e ≤ 25	130		65		14	12		
			120		65		12	10		
	T5	e ≤ 25	175		130		8	6		
T6	e ≤ 25	215		170		10	8			
Extruded Bar	O/H111	D ≤ 200 C ≤ 200		130			18	16		
				130			18	16		
	T4	D ≤ 150 C ≤ 150 150 < D ≤ 200 150 < C ≤ 200	130		65		14	12		
			130		65		14	12		
			120		65		12			
			120		65		12			
	T5	D ≤ 200 C ≤ 200	175		130		8	6		
			175		130		8	6		
T6	D ≤ 150 C ≤ 150 150 < D ≤ 200 150 < C ≤ 200	215		170		10	8			
		215		170		10	8			
		195		160		10				
		195		160		10				

Table VIII

ALLOY 6082

Semi products	Temper	Dimension (mm) Diameter D Thickness t Width across flats C	Rm (MPa)		Rp _{0,2} (MPa)		A% min		Folding radius	
			min	max	min	max	A ₅₀	A	180 °	90 °
Sheet and Plate	O	3,0 < e ≤ 6,0		150		85	18			1,0 e
		6,0 < e ≤ 12,5		150		85	17			2,0 e
		12,5 < e ≤ 25,0		155				16		
Sheet and Plate	T4	3,0 < e ≤ 6,0	205		110		15			3,0 e
		6,0 < e ≤ 12,5	205		110		14			4,0 e
Sheet and Plate	T6	3,0 < e ≤ 6,0	310		260		10			4,5 e
		6 < e ≤ 12,5	310		255		9			6,0 e
Extruded Profile	O/H111	toutes		160		110	14	12		
	opent	T4	e ≤ 25,0	205		110	14	12		
		T5	e ≤ 5,0	270		230	8	6		
		T6	e ≤ 5,0 5 < e ≤ 25	290 310		250 260	8 10	6 8		
	closed	T5	e ≤ 5	270		230	8	6		
		T6	5 < e ≤ 15	310		260	10	8		
Extruded Tube	O/H111	e ≤ 25		160		110	14	12		
	T4	e ≤ 25	205		110		14	12		
	T6	e ≤ 5 5 < e ≤ 25	290 310		250 260		8 10	6 8		
Extruded Bar	O/H111	D ≤ 200		160		110	14	12		
		C ≤ 200		160		110	14	12		
	T4	D ≤ 200	205		110		14	12		
		C ≤ 200	205		110		14	12		
	T6	D ≤ 20	295		250		8	6		
		C ≤ 20	295		250		8	6		
		20 < D ≤ 150	310		260		8			
20 < C ≤ 150		310		260		8				
150 < D ≤ 200		280		240		6				
150 < C ≤ 200	280		240		6					
200 < D ≤ 250	270		200		6					
200 < C ≤ 250	270		200		6					

Table IX

ALLOY 6061										
Semi products	Temper	Dimension (mm) Diameter D Thickness t Width across flats C	Rm (MPa)		Rp _{0,2} (MPa)		A% min		Folding radius	
			min	max	min	max	A ₅₀	A	180 °	90 °
Sheet and Plate	O	3,0 < e ≤ 6,0		150		85	9			1,0 e
		6,0 < e ≤ 12,5		150		85	16			2,0 e
		12,5 < e ≤ 25,0		150				16		
Sheet and Plate	T4	3,0 < e ≤ 6,0	205		110		16			3,0 e
		6,0 < e ≤ 12,5	205		110		18			4,0 e
Sheet and Plate	T6	3,0 < e ≤ 6,0	290		240		10			4,0 e
		6,0 < e ≤ 12,5	290		240		9			5,0 e
Extruded Profile	T4	e ≤ 25	180		110		15	13		
Profile	T6	e ≤ 5,0	260		240		9		7	
		5 < e ≤ 25	260		240		10	8		
Extruded Tube	O/H111	e ≤ 25		150		110	16	14		
	T4	e ≤ 25	180		110		15	13		
	T6	e ≤ 5	260		240		8	6		
		5 < e ≤ 25	260		240		10	8		
Extruded Bar	O/H111	D ≤ 200		150		110	16	14		
		C ≤ 200		150		110	16	14		
	T4	D ≤ 200	180		110		15	13		
		C ≤ 200	180		110		15	13		
Extruded Bar	T6	D ≤ 200	260		240		8	6		
		C ≤ 200	260		240		8	6		

Table X

2. | INDEX

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3. | ENGLISH / FRENCH / GERMAN / SPANISH GLOSSARY

N°	English	French	German	Spanish
1.		Etat trempé mûri	Abgeschreckt und ausgelagert	Templado templado y madurado
2.	Age hardening	Durcissement structural	Aushärtung	Endurecimiento estructural
3.	Air quenching	Trempe à l'air	Luftabschrecken	Temple al aire
4.	Alloy	Alliage	Legierung	Aleacion
5.	Alloying element	Elément d'addition	Legierungselement	Elemento de adición
6.	Aluminium	Aluminium	Aluminium	Aluminio
7.	Aluminium alloy	Alliage d'aluminium	Aluminiumlegierung	Aleacion de aluminio
8.	Annealing	Recuit	Glühung	Recocido
9.	Anodizing	Anodisation	Anodisation	Anodización
10.	Artificial ageing	Revenu	Warmauslagerung	Revenido
11.	Artificially aged	Etat revenu	Warmausgehärtet	Estado revenido
12.	As-quenched condition	Brut de trempe	Abgeschreckt	Bruto de temple
13.	As-quenched condition	Trempe fraîche	Frische Abschreckhärtung	Temple al agua
14.	As-quenched temper	Etat trempé	Abgeschreckter Zustand	Estado templado
15.	Bar, Rod	Barre	Stab, Stange	Barra
16.	Bend radius	Rayon de pliage	Biegeradius	Radio de plegado
17.	Bending	Cintrage	Biegen	Doblado
18.	Bevel	Chanfrein (de soudure)	Abschrägung	Chaflan de soldadura
19.	Blackening	Noircissement	Schwärzung, Trübung	Ennegrecimiento
20.	Blankholder	Serre flan	Niederhalter	Pisador
21.	Bonding	Collage	Kleben	Pegado
22.	Bow	Flèche longitudinale	Längsdurchbiegung	Flecha longitudinal
23.	Brittleness	Fragilité	Sprödigkeit	Fragilidad
24.	Brushing	Brossage	Bürsten	Cepillado
25.	Buckling	Flambement	Knicken	Flameado
26.	Buffing	Polissage au disque	Schwabbeln	Pulido al disco
27.	Burr	Bavure	Grat	Rebabas
28.	Cast	Coulée	Abguß	Colada
29.	Casting	Moulage	Guß	Fundición
30.	Casting alloy	Alliage de moulage	Gußlegierung	Aleacion para moldeo
31.	Chemical conversion	Conversion chimique	Chemische Konversion	Conversion química
32.	Chemical polishing	Polissage chimique	Chemisches Polieren	Pulido químico
33.	Clad sheet	Tôle plaquée	Plattiertes Blech	Chapa placada
34.	Cladding	Placage	Plattierung	Plaqueado
35.	Clinching	Clinchage	Clinchen	Clisado
36.	Clipping	Ebarbage	Entgratung	Desbarbado
37.	Coating	Revêtement	Beschichten	Revestimiento

N°	English	French	German	Spanish
38.	Coil	Bande	Band	Banda
39.	Coil coating	Revêtement en bande	Bandbeschichtung	Revestimiento en banda
40.	Cold working, Strain hardening	Ecrouissage	Kaltverfestigung	Endurecimiento por conformacion
41.	Controlled stretching	Traction contrôlée	Kontrolliertes Recken	Traccion controlada
42.	Cooling	Refroidissement	Abkühlung	Enfriamiento
43.	Corrosion	Corrosion	Korrosion	Corrosion
44.	Crack	Fissure	Riß	Fisura
45.	Creep	Fluage	Plastisches Fließen	Flujo
46.	Crevice corrosion	Corrosion caverneuse	Spaltkorrosion	Corrosion cavernosa
47.	Crevice corrosion	Corrosion sous dépôt	Belagkorrosion	Corrosion por almacenamiento
48.	Critical quenching rate	Vitesse critique de trempe	Kritische Abschreckgeschwindigkeit	Velocidad critica de temple
49.	Critical strain	Ecrouissage critique	Kritischer Verformungsgrad	Endurecimiento critico
50.	Crown	Bombé	Bombierung	Abombado
51.	Cutting	Découpage	Schneiden	Cortado
52.	Defect	Défaut	Qualitätsmangel	Defecto
53.	Degreasing	Dégraissage	Entfettung	Desengrasado
54.	Desensitization	Désensibilisation	Desensibilisierungsglühung	Desensibilizacion
55.	Destructive test	Essai destructif	Zerstörungsprüfung	Ensayo destructivo
56.	Die forging	Matriçage	Gesenkschmieden	Matrizado
57.	Die scores	Rayure de filière	Preßriefen	Rayado de hilera
58.	Dilatation	Dilatation	Wärmedehnung	Dilatacion
59.	Dissolution potential	Potentiel de disssolution	Auflösungspotential	Potencial de disolucion
60.	Drawing	Emboutissage	Tiefziehen	Embuticion
61.	Drawing	Etirage	Ziehen	Estirado
62.	Drawn tube	Tube étiré	Kaltgezogenes Rohr	Tubo estirado
63.	Ductility	Ductilité	Duktilität	Ductilidad
64.	Eddy current test	Essai par courants de Foucault	Wirbelstromprüfverfahren	Ensayo corriente de Foucault
65.	Edge trimming	Ebavurage	Abgraten, Entgraten	Desbardado
66.	Electrical conductivity	Conductivité électrique	Elektrische Leitfähigkeit	Conductividad electrica
67.	Electrical resistivity	Résistivité électrique	Spezifischer elektrischer Widerstand	Resistidad electrica
68.	Elongation	Allongement	Dehnung	Alargamiento
69.	Exfoliation corrosion	Corrosion exfoliante Corrosion feuilletante	Schichtkorrosion	Corrosion exfoliante/escamosa
70.	Extruded profil	Profilé filé	Vollprofil	Perfil
71.	Extruded rod/bar	Barre filée	Stranggepreßte Stange	Barra extruida
72.	Extruded tube	Tube filé	Stranggepreßtes Rohr	Tubo extruido
73.	Extrusion	Filage	Strangpressen	Extrusion
74.	Extrusion die	Filière	Preßmatrize	Hilera
75.	Extrusion press	Presse à filer	Strangpresse	Prensa extrusion
76.	Fatigue	Fatigue	Ermüdung	Fatiga

N°	English	French	German	Spanish
77.	Fatigue limit	Limite de fatigue	Dauerfestigkeit	Limite de fatiga
78.	Fatigue strength	Résistance à la fatigue	Dauerfestigkeit, Ermüdungsfestigkeit	Resistencia a la fatiga
79.	Fitup	Accostage	Anlegen	Acercamiento
80.	Flash annealing	Recuit flash	Stoßglühung	Recocido flash
81.	Flatness	Planéité	Ebenheit	Planeidad
82.	Flattening	Planage	Richten	Aplanado
83.	Flowturning	Fluotournage	Drückwalzen	Fluortorneado
84.	Folding	Pliage	Falten	Plegado
85.	Forming, Shaping,	Mise en forme	Formen	Conformado
86.	Fracture toughness Toughness,	Ténacité	Bruchzähigkeit, Zähigkeit	Resistencia a la fissura
87.	Galvanic corrosion	Corrosion galvanique	Galvanische Korrosion	Corrosion galvanica
88.	Gauge	Calibre	Kaliber, Blechdicke	Calibre
89.	Gouging	Gougeage	Fugenhobeln	Acanalado
90.	Grade	Classe	Güte	Clase
91.	Grain	Grain	Korn	Grano
92.	Grain growth	Grossissement du grain	Kornwachstum	Crecimiento grano
93.	Grain size	Taille de grain	Korngröße	Tamaño del grano
94.	Grinding	Meulage	Schleifen	Esmerilado
95.	Half hard temper	Etat demi dur	Halbhart-Zustand	Estado semi duro
96.	Hand forging	Forgeage	Schmieden	Forjado
97.	Hard temper	Etat quatre quart dur	Hart-Zustand	Estado duro
98.	Hardness	Dureté	Härte	Dureza
99.	Hart anodizing	Anodisation dure	Hartanodisation	Anodizacion dura
100.	Heat treatment	Traitement thermique	Wärmebehandlung	Tratamiento termico
101.	Heat-affected zone	Zone affectée thermiquement	Wärmeeinflußzone	Zona afectada termicamente
102.	Heat-treatable alloy	Alliage à durcissement structural	Aushärtbare Legierung	Aleacion tratable térmicamente
103.	Hollow shape	Profilé creux	Hohlprofil	Perfil hueco
104.	Hollow-ware manufacture	Chaudronnage	Blechverarbeitung	Caldedera
105.	Homogenization	Homogénéisation	Homogenisierung	Homogeneizacion
106.	Hot rolled sheet	Tôle laminée à chaud	Warmwalzblech	Chapa laminada en caliente
107.	Hot rolled temper (F)	Etat brut de laminage à chaud (F)	Warmwalzzustand (F)	Estado bruto de laminado en caliente
108.	Hot shortness	Fragilité à chaud	Warmbrüchigkeit	Fragilidad en caliente
109.	Impact resistance, Shock resistance	Résistance au choc	Schlagfestigkeit	Resistencia al choque
110.	Inspection	Contrôle	Kontrolle	Control
111.	Intercrystalline corrosion	Corrosion intercrystalline	Interkristalline Korrosion	Corrosion intercrystalina
112.	Intergranular corrosion	Corrosion intergranulaire	Korngrenzenkorrosion	Corrosion intergranular
113.	Laquering	Vernissage	Transparentlackieren	Bamizado
114.	Lateral bow, Lateral curvature	Fleche latérale	Abweichung von der Geradheit	Flecha lateral

N°	English	French	German	Spanish
115.	Length	Longueur	Länge	Largo
116.	Long transverse direction	Sens travers long	Längs-Querrichtung	Dirección transversal larga
117.	Longitudinal direction	Sens long	Längsrichtung	Dirección longitudinal
118.	Machining	Usinage	Spanabhebende Bearbeitung	Mecanizado
119.	Mechanical polishing	Polissage mécanique	Mechanisches Polieren	Pulido mecánico
120.	Mechanical properties	Caractéristiques mécaniques	Mechanische Eigenschaften	Características mecánicas
121.	Metal	Métal	Metall	Metal
122.	Microstructure	Microstructure	Mikrogefüge	Microestructura
123.	Milling	Fraisage	Fräsen	Fresado
124.	Modulus of elasticity	Module d'élasticité	Elastizitätsmodul	Modulo elastico
125.	Natural ageing	Maturation	Kaltauslagerung	Maduración
126.	Natural oxide film	Film d'oxyde naturel	Natürliche Oxidhaut	Capa óxido natural
127.	Natural oxide film	Oxyde naturel	Natürliche Oxidschicht	Oxido natural
128.	Non destructive testing	Essai non destructif	Zerstörende Prüfung	Ensayo no destructivo
129.	Over-ageing	Sur revenu	Überalterung	Sobre revenido
130.	Overheating	Surchauffe	Überhitzung	Sobrecalentamiento
131.	Packaging	Emballage	Verpackung	Embalaje
132.	Painted sheet	Tôle laquée	Lackiertes Blech	Chapa lacada
133.	Painting	Peinture	Decklackieren	Pintura
134.	Partial annealing	Restauration	Anlassen auf Zustand, Erholung	Restauración
135.	Partially annealed	Etat restauré	Rückgeglühter Zustand	Estado restaurado
136.	Penetration test	Ressuage	Penetrationstest	Resudación
137.	Percentage elongation	Allongement pour cent	Dehnung in Prozent	Porcentaje de alargamiento
138.	Permanent set	Déformation permanente	Bleibende Verformung	Deformación permanente
139.	Physical properties	Propriétés physiques	Physikalische Eigenschaften	Propiedades físicas
140.	Pickling	Décapage	Beizen	Decapado
141.	Pitting	Piqure (de corrosion)	Lochfraßstelle	Corrosion superficial
142.	Pitting corrosion	Corrosion par piqure	Lochfraßkorrosion	Corrosion por picadas
143.	Plate	Tôle épaisse	Dickes Blech, Platte	Chapa alto espesor
144.	Polishing	Polissage	Polierung	Pulido
145.	Porosity	Porosité	Porosität	Porosidad
146.	Porthole die	Filière à pont	Kammerwerkzeug	Hilera al puente
147.	Pre-ageing	Pré revenu	Vorauslagerungsbehandlung	Pre-revenido
148.	Press	Presse	Presse	Prensa
149.	Press brake	Presse à plier	Biegepresse	Plegadora
150.	Press quenching	Trempe sur presse	Abschrecken aus der Preßhitze	Temple sobre prensa
151.	Primer	Primaire	Primer	Primario
152.	Proof strength (Rp)	Limite conventionnelle d'élasticité (Rp)	Dehngrenze bei nichtproportionaler Verlängerung (Rp)	Limite elastico convencional
153.	Quarter hard temper	Etat quart dur	Viertelhart-Zustand	Estado un cuarto duro
154.	Quenching	Trempe	Abschrecken	Temple

N°	English	French	German	Spanish
155.	Recovery annealing	Recuit de restauration	Erholungsglühen	Recocido de restauracion
156.	Recrystallisation annealing	Recuit de recristallisation	Rekristallisationsglühung	Recocido de recristalizacion
157.	Recrystallization	Recristallisation	Rekristallisation	Recristalizacion
158.	Recycling	Recyclage	Recycling	Reciclado
159.	Residual stress	Contrainte résiduelle	Restspannung	Tension residual
160.	Rivet	Rivet	Niete	Remache
161.	Rod	Barre ronde	Rundstange	Barra redonda
162.	Roller levelling	Planage à rouleaux	Rollrichten	Aplanado con rodillos
163.	Rolling	Laminage	Walzen	Laminado
164.	Sample	Echantillon	Muster	Muestra
165.	Sand blasting	Sablage	Sandstrahlen	Arenado
166.	Sawing	Sciage	Sägen	Serrado
167.	Scoring	Rayure	Riefen	Rayado
168.	Scrap	Déchets	Schrott	Chatarras
169.	Sealing	Colmatage	Verdichten	Colmataje
170.	Seamless tube	Tube sans soudure	Nahtloses Rohr	Tube sin soldadura
171.	Semifinished product	Demi-produit	Halbzeug	Semi-producto
172.	Shape	Forme	Form	Forma
173.	Shear strength	Résistance au cisaillement	Kritische Scherspannung	Resistencia al cizallado
174.	Shearing	Cisaillement	Abscherung	Cizallado
175.	Sheet	Tôle	Blech	Chapa
176.	Short transverse direction	Sens travers court	Kurz-Querichtung	Direccion transversal corta
177.	Shot blasting, Blast cleaning	Grenillage	Strahlen	Granallado
178.	Slitting	Refendage	Längsteilen, Spalten	Cortado longitudinal
179.	Soft annealing	Recuit d'adoucissement	Weichglühung	Recocido para alisado
180.	Soft temper (O)	Etat recuit (O)	Geglüht-Zustand (O)	Estado recocido
181.	Solid shape	Profilé plein	Strangpreßprofil	Perfil macizo
182.	Solution treatment	Mise en solution	Lösungsglühen	Disolucion
183.	Specification	Spécification	Spezifikation	Especificacion
184.	Spinning	Repoussage	Flachprägen, Metalldrücken	Repulsado
185.	Spot welding	Soudage par point	Punktschweißen	Soldadura por puntos
186.	Squareness	Equerrage	Rechtwinkligkeit	Escuadrado
187.	Stabilized temper	Etat stabilisé	Stabilisierter Zustand	Estado estabilizado
188.	Standard	Norme	Norm	Norma
189.	Storage	Stockage	Lagerung	Almacenamiento
190.	Straightening	Dressage	Richten	Enderezado
191.	Straightness	Rectitude	Geradheit	Rectitud
192.	Strain	Déformation	Verformung	Deformacion en caliente
193.	Strain hardened temper	Etat écroui	Kaltverfestigter Zustand	Endurecido en frio

N°	English	French	German	Spanish
194.	Strain hardening	Durcissement par écrouissage	Verfestigung	Endurelimiento por conformacion en frio
195.	Strain-hardening alloy	Alliage à durcissement par écrouissage	Kaltverfestigende Legierung	Aleacion endurecida por conformacion en frio
196.	Streak	Strie	Streifen, Zeile	Estria
197.	Stress	Contrainte	Spannung	Tension
198.	Stress corrosion	Corrosion sous contrainte	Spannungsrißkorrosion	Corrosion bajo tension
199.	Stretching	Traction	Recken, Reckrichten	Traccion
200.	Surface condition	Etat de surface	Oberflächenbeschaffenheit	Estado superficial
201.	Surface milling	Surfaçage	Fräsung	Mecanizado superficial
202.	Surface roughness	Rugosité superficielle	Oberflächenrauheit	Rugosidad superficial
203.	Surface traitement	Traitement de surface	Oberflächenbehandlung	Tratamiento superficial
204.	Temper	Etat (métallurgique)	Werkstoffzustand	Estado (metalurgico)
205.	Tensile strength	Résistance à la traction	Zugfestigkeit	Resistencia a la traccion
206.	Tension levelling	Planage sous tension	Bandrecken, Reckbiegerichten	Aplanado bajo tension
207.	Test	Essai	Prüfung	Ensayo
208.	Texture	Texture	Textur	Textura
209.	Thermal conductivity	Conductivité thermique	Wärmeleitfähigkeit	Conductividad termica
210.	Thickness	Epaisseur	Wanddicke	Espesor
211.	Three quarter hard temper	Etat trois quart dur	Dreiviertelhart-Zustand	Estado très quarto duro
212.	Tolerance	Tolérance	Toleranz, Grenzabmaß	Tolerancia
213.	Traffic marks	Fretting corrosion	Transportscheuerstellen	Marcos de friccion
214.	Transverse direction	Sens travers	Querrichtung	Direccion transversal
215.	Tread plate	Tôle relief	Warzenblech, Trittlech	Chapa relieve
216.	Tube	Tube	Rohr	Tube
217.	Ultimate tensile strength	Charge de rupture	Zugfestigkeit	Carga de rotura
218.	Ultrasonic test	Contrôle ultra-sons	Ultraschallprüfung	Control ultra sonido
219.	Under-ageing	Sous revenu	Unteralterung	Subvenido
220.	Water stain	Corrosion lors du stockage	Wasserflecken	Corrosion durante el stock
221.	Water staining	Ternissement	Trübung	Deslucimiento
222.	Weathering	Corrosion atmosphérique	Atmosphärische Korrosion	Corrosion atmosférica
223.	Weldability	Soudabilité	Schweißbarkeit	Soldabilidad
224.	Welded tube	Tube soudé	Längsnahtgeschweißtes Rohr	Tube soldado
225.	Welding	Soudage	Schweißen	Soldadura
226.	Welding wire, Filler wire	Fil d'apport	Schweißdraht	Hilo de aportacion
227.	Width	Largeur	Breite	Ancho
228.	Work hardening	Corroyage	Verschmiedungsgrad	Fresado
229.	Working	Transformation	Umformung	Transformacion
230.	Wrought alloy	Alliage de corroyage	Knetlegierung	Aleacion de fresado
231.	Wrought product	Produit corroyé	Knetzeugnis	Producto modelado
232.	Yield strength	Limite apparente d'élasticité	Streckgrenze	Limite elastico aparente

4. KEY AND PHOTO CREDITS



Rodriquez Cantieri Navali

Page 4

THE PRINCESS

Built by Rodriquez, Italy
Monohull HSV type
Aquastrada TMV84
Launched in 2003
Aluminium hull and superstructure
Length over all: 83.35 m,
beam: 13.50 m, draft: 1.76 m
Speed: 39 knots
Capacity: 462 passengers and
58 cars.

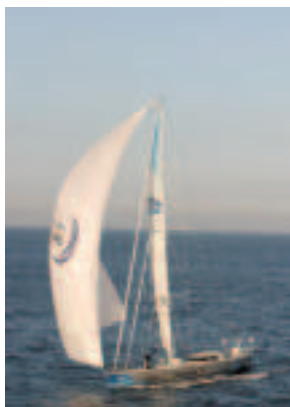


Tranz Rail

Page 5

THE LYNX

Built by Incat Tasmania PTY Ltd,
Australia
Type: HSV Catamaran
Aluminium hull
Overall length: 97.22 m,
beam: 26.60 m, draught: 3.42 m
Speed: 38 knots with a payload
of 750 t and 42 knots
with a 375 t payload
Capacity 900 passengers
Vehicle capacity: approx.
20 trucks + 80 cars, or 267 cars.



Benoit Stichebaut - DPPI Rivacom

Page 7

THE GLOBAL CHALLENGE

It is with the yacht "Adrien" that
Jean-Luc Van Den Heede beat
the record for circumnavigating
the world "the wrong way
round" in March 2004,
in 122 days, 29 days faster
than the previous record set
by Philippe Monnet.
The "Adrien" is 25.70 m long,
5.40 m wide and with a draft of
4.60 m is made from Sealium®
and 5083 aluminium alloys
supplied by Pechiney Marine.
It was built at Chantiers Gamelin
of La Rochelle (F-17000) to
drawings by the naval architect
Gilles Vaton.



Rodriquez Cantieri Navali

Page 8

THE VESUVIO JET

Built by Rodriquez, Italy
Type: HSV monohull
Aquastrada TMV 50
Launched in 2003
Aluminium hull
and superstructure
Overall length: 50.46,
beam: 8.80 m, draft: 1.35 m
Speed: 32 knots
Capacity 460 passengers
The lightness of weight due to
the 'all aluminium' construction
of this boat, and its powerful
propulsion system, enhance
the manoeuvrability of this type
of vessel. The saving in weight
allows the 'waterjets'
to manoeuvre over very short
distances.



Photo X

Page 10

THE AMPORELLE

The "Amporelle," an aluminium
monohull ferry with a length of
38.07 m and a beam of 7.46 m,
has been operated since 1992 by
the "Yeu Continent" company of
Fromentine (France) on the Ile
d'Yeu - Fromentine crossing. It
can carry up to 360 passengers.
The relatively shallow waters on
this route call for a vessel with
a draught that is equally shallow,
hence one that is light in weight.
The ferry has speed under load
of 25 knots and a top speed
of 30 knots.



SNCM post card - Photo X

Page 11

HSV ALISO

The HSV ALISO, launched
in 1996, plies routes between
France and Corsica.
This monohull ferry is 102 m long
and 15.40 m wide, with a draft
of 4.35 m.
Its speed under a load of 247 t
in calm seas is 37 knots, at 90 %
power (26,000 kW installed).
It can carry 566 passengers and
146 cars.



Rodriquez Cantieri Navali

Page 20

THE PRINCESS

See key of page 4.



Rodriquez Cantieri - Navali

Page 22

FEDERICO GARCÍA LORCA

Built at Rodriquez Cantieri Navali
This monohull vessel in
the Aquastrada TMV 115 series
is 115 m long and can carry
220 cars on its decks and has
300 linear metres for trucks which
gain access by means of
a retractable ramp.



Austral Ships Pty Ltd

Page 23

THE SPIRIT OF ONTARIO

Built by Austral Ships, Australia
Catamaran launched in 2003
Length: 86.60 m, draft: 3.40 m
Speed 43 knots
Capacity 774 passengers,
238 cars and 10 trucks.



Baglietto

Page 32

HARD TOP YACHT

Due for delivery in April 2004
 Built by Baglietto, architect:
 F. Paszkowski
 Overall length 31.92 m, speed
 35 knots. This fast yacht sports a
 highly streamlined design for both
 hull and superstructure.
 In order to achieve this high
 speed, the height of the yacht
 has been reduced so far as
 possible to minimise drag in both
 air and water.



Kurt Coste & Trinity Yachts

Page 34

THE SEAHAWK

Built by Trinity Yachts, USA
 Launched in 2003
 3 deck motor yacht
 Overall length 45.78 m,
 draft 2.32 m
 Passengers: 10.



Rodriquez Cantieri Navali

Page 35

THE NATALIE M

Built by Rodriquez, Italy
 Launched in 2002
 Monohull hydrofoil with an
 aluminium hull and superstructure
 Overall length 31.20 m,
 width 6.78 m, draft 1.66 m
 Speed 40 knots
 Capacity: 240 passengers.



Rodriquez Cantieri Navali

Page 43

Aluminium Waterjet LJ114E

Built by Rodriquez, Italy
 On the TMV 115 "Garcia Lorca",
 each of the two motors is
 coupled directly to a waterjet.
 Each waterjet has sufficient
 thrust to enable the vessel
 to make port rapidly should there
 be a problem with the other.

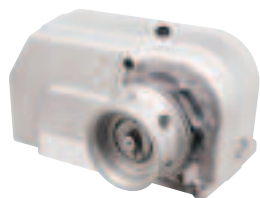


Photo X

Page 45

OPUS 45, under construction

Motor Yacht
 Built by Koopmans Kasko's
 Design: Van Witze Van Der Vzee
 Naval architect: Dickkzaal
 Hull and deck made from Sealium®
 Length 13.75 + 0.40 m,
 width 4.40 m
 Speed up to 28 knots according to
 motor rating.



B-Y Leglatin

Page 49

WINDLASS 312

By Goïot, of Saint-Herblain, France
 This windlass is designed for use
 on vessels up to 20 tonnes. All of
 its components – the casing,
 cable wheel and capstan head –
 are cast from 51300 aluminium
 alloy (A-G6).
 The system has constant oilbath
 lubrication to minimise the need
 for maintenance.
 As it is anodised, this unit will
 retain its highly attractive
 appearance for many years.



Rodriquez Cantieri Navali

Page 51

AQUASTRADA TMV 115 Engine room

Built by Rodriquez of Italy.
 This vessel is fitted with four
 Caterpillar 3618 diesel engines,
 each rated at 7200 kW
 (at 2100 RPM).
 The engine room has been
 specially designed and fitted out
 to accommodate each engine
 in its own fire resistant zone
 so as to avoid propagation
 in the event of fire.
 It will be seen that that walkways
 are constructed using relief tread
 plate in 5XXX.



Babcock

Page 52

CATAMARAN UAI 50

Built by Babcock, Great Britain
 This 50 metre long catamaran is
 a variant of the 45 metre Tricat.
 It has a maximum speed
 of 37 knots and can carry
 400 passengers.
 The originality of this TRICAT lies
 in the construction of its hull. The
 two hulls are interconnected by
 means of a transverse structure
 consisting of 6XXX alloy sections
 automatically welded to each
 other to form an extremely rigid
 cross-panel. This type of structure
 is highly suitable given the fact
 that on a catamaran, the greatest
 stresses occur transversely
 between the two hulls.
 This makes it possible to increase
 the vessel's level of equipment
 without increasing the depth
 of the hull.
 The superstructure is made from
 an assembly of automatically
 welded stiffeners with which
 large rigid panels can be very
 quickly fabricated.



Rodriquez Cantieri Navali

Page 54

THE PRINCESS

See key of page 4.



Rodriquez Cantieri Navali

Page 55

THE PRINCESS

See key of page 4.



C. Vargel

Page 72

Structure of a Monohull
 made from frames fabricated
 in 5XXX sheet, welded
 and connected using ribbands
 in shapes made from 6XXX.