

Welding application	Special considerations	Common base materials	Filler metal selection
<b>Shipbuilding and sub-suppliers</b>			
<b>Requirements:</b> <b>Saltwater corrosion resistance, pressure vessel service, thick plate welding</b>			
Structural frames	Strength & fatigue, corrosion, extrusions & cut plate	6061 to 6061 6061 to 5086 5086 to 5086 5083 to 5083	AL Mg5 AL Mg5 AL Mg5 AL Mg4,5Mn
Skin	Strength & corrosion	5052 to 5052 5086 to 5086 6061 to 6061 5083 to 5083	AL Mg5, AL Si5 (2 <sup>nd</sup> choice) AL Mg5 AL Mg5 AL Mg4,5Mn
Desalination units	Corrosion & high temperatures	5454 to 5454 5052 to 5052	AL Mg3 AL Mg3
Tube railings	Strength & anodize	6061 to 6061 6063 to 6063	AL Mg5 AL Mg5
Structural plate & LNG tanks	Impact strength & cold temperature properties	5083 to 5083	AL Mg4,5Mn
Marine cast hardware	Strength & corrosion	5180 to 5180 5350 to 5350	AL Mg5 AL Mg5
<b>Cars, manufacturing and sub-suppliers</b>			
<b>Requirements:</b> <b>Thin wall brazing for heat exchangers, corrosion resistant high strength wheels, high torque drive components, body and frame joining</b>			
Heat exchangers	Pressure seal, corrosion resistance & thin wall burst pressure	3003 to 3003 3003 to 6061 6061 to 6061	AL Si12, AL Si5 (2 <sup>nd</sup> choice) AL Si12, AL Si5 (2 <sup>nd</sup> choice) AL Si12, AL Si5 (2 <sup>nd</sup> choice)
Wheels	Shear strength, fatigue and high temperature	5454 to 5454 5454 to 6061 5356 to 5454	AL Mg3 AL Mg3 AL Mg3
Drive shafts	Torque / shear strength & fatigue	6061 to 6061	AL Mg5
Bumpers & supports	Impact strength, corrosion resistance & extrusions	7005 to 7005 7029 to 7029	AL Mg5
Body panels	Tensile strength, corrosion resistance & thin wall welding	6009 to 6009 6011 to 6011	AL Si5, AL Si12 (2 <sup>nd</sup> choice) AL Si5, AL Si12 (2 <sup>nd</sup> choice)
Frame sections	Strength & fatigue	6061 to 6061	AL Si5
<b>Trucks, buses and trailers</b>			
<b>Requirements:</b> <b>High quality production welding technology, product cost optimization, product reliability engineering</b>			
Formed truck panels	Formability & corrosion resistance	5052 to 5052 5052 to 5454 5454 to 5454	AL Mg5 AL Mg5 AL Mg5
Engine blocks cast housings	Weld cracking	356 to 356	AL Si12
Cylinder heads	Weld cracking	A201.0 to A201.0 240.0 to 240.0 242.0 to 242.0	AL Si12 AL Si12 AL Si12
Forged pistons	Weld cracking	2218 to 2218 2618 to 2618	AL Si5 AL Si5

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<b>Trucks, buses and trailers</b>			
<b>Requirements:</b> High quality production welding technology, product cost optimization, product reliability engineering			
Truck panels	Strength, cost efficiency & fatigue	5454 to 5454 5086 to 5086 5083 to 5083	AL Mg5, AL Mg3 (2 <sup>nd</sup> choice) AL Mg5 AL Mg5, AL Mg4,5Mn (2 <sup>nd</sup> choice)
Chemical tankers	Strength & corrosion resistance	5254 to 5254	AL Mg4,5Mn
Line heaters & steam liners	Strength & high temperature	5454 to 5454	AL Mg3
Trim	Formability, anodize & polish	5050 to 5050 5005 to 5005	AL Mg5 AL Mg5
<b>Trains, railway cars</b>			
<b>Requirements:</b> High quality production welding technology, product cost optimization, product reliability engineering			
Train panels	Strength & fatigue cost efficiency	5454 to 5454 5086 to 5086 5083 to 5083	AL Mg5, AL Mg3 (2 <sup>nd</sup> choice) AL Mg5 AL Mg4,5Mn
<b>Aerospace &amp; defence industry</b>			
<b>Requirements:</b> Extreme temperature service, maximum strength-to-weld ratios, X-ray inspection standards, armour plate technology, complex joint designs			
Aerospace hardware	Strength-to-weight ratio	6061 to 6061 6013 to 6013 If anodized PWHT	AL Si5 AL Si5 AL Mg5 AL Si5
Turbine blades and torque converters	Strength-to-weight ratio	711.0 to 711.0	AL Mg5
Armour plate	Impact strength & strength-to-weight ratio	5083 to 5083 7039 to 7039	AL Mg5 AL Mg5
Military bridges	Strength-to-weight ratio	7039 to 7039 PWHT	AL Mg5
<b>Other transport equipment</b>			
<b>Requirements:</b> Alloys for maximum strength-to-weight ratios, high strength thin wall joining, complex heat treatment			
Bicycle frames & sport wheels	Strength fatigue & anodize	6061 to 6061 6061 to 6061 PWHT 7005 to 7005  7046 to 7046  5086 to 5086	AL Mg5 AL Si5  AL Mg5, AL Mg4,5Mn (2 <sup>nd</sup> choice) AL Mg5, AL Mg4,5Mn (2 <sup>nd</sup> choice) AL Mg5
Tops & sleds	Deep drawing & forming	1070 to 1070 1100 to 1100	AL 99,7 AL Si5
Frame extrusions & body sheet	Strength-to-weight ratio & forming	6061 to 6061 5454 to 5454 5086 to 5086 5052 to 5052	AL Mg5 AL Mg5 AL Mg5 AL Mg5

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<b>Energy generation incl. boilers and pressure vessels. Turbines. power plants, windmills</b> <b>Requirements:</b> <b>Defect free production welding technology, special alloys for specific environments</b>			
Pressure vessel	Strength	5456 to 5456	AL Mg4,5Mn AL Mg4,5MnZr (on request) AL Mg5Mn (on request)
Marine & cryogenic tanks	Temperature & strength	5083 to 5083	AL Mg4,5Mn
Chemical tanks	Chemical (acids), processing (food), H <sub>2</sub> O <sub>2</sub> , corrosion & strength	1060 to 1060 1100 to 1100 3003 to 3003 5254 to 5254	AL Si5 AL Si5 AL Si5 AL Mg3
<b>General repair &amp; maintenance</b> <b>Requirements:</b> <b>In field repair of cast aluminium objects, in workshop repair of aluminium objects, anodized aluminium parts</b>			
General repairs of aluminium products e.g. cylinders heads, machine bases, small engine crank cases, marine etc.	Pure/cast Al anodized, Mn & Mg Al alloys, AlMgSi alloys, unalloyed aluminium cast silicon aluminium alloys general grades	N/A N/A 6060 / 6083 N/A N/A all	AL 99,7 AL Mg3