

**TECHNICAL INFORMATION**

**ALUMINIUM SPECIFICATIONS**

**ALUMINIUM ALLOYS FOR CONNECTION HEADS**

Aluminium connection heads are used in industry as rugged terminal junction boxes for building temperature sensors, pressure transmitter, level transmitter, electronic transmitter housing, etc. Aluminium enclosure are also often exposed to conditions which can cause corrosion and they must be protected again this.

**ALUMINIUM CASTING METHOD**

Limatherm use to produce aluminium enclosure pressure die-casting method.

**ALUMINIUM ALLOYS**

Limatherm use as a standard alloy

Polish Standard	Comparable to the Polish Standard		Cost Factor
	Germany Standard	European Standard	
AK 93 lc	GD-AISI9Cu3 No. 226	EN AC –AISi9Cu3	1
		EN AC – 46 000	

Limatherm can use on request alloy

Polish Standard	Comparable to the Polish Standard		Cost Factor
	Germany Standard	European Standard	
AK 11 lc	GD-AISI12(Cu) No. 231	EN AC – AISi12Cu1	1.06
		EN AC - 47100	

Limatherm can use on request cooper free alloy USED IN AW-LAKE COMPANY PURCHASED HOUSINGS

Polish Standard	Comparable to the Polish Standard		Cost Factor
	Germany Standard	European Standard	
AK 11 B lc	GD-AISI12 No. 230	EN AC –AISi12	1.32
		EN AC - 44200	

**COOPER FREE ALUMINIUM**

Limatherm can use also cooper free alloy. The term „Copper Free,, is used to describe aluminium alloys which contain less than 0,4% copper.

The copper content for pressure die casting not exceed 0,05%. It is the reduction in the copper content which, increases the natural corrosion resistant properties of aluminium.

Copper Free aluminium is particularly resistant to salt atmosphere, sulphur gases and ammonium nitrate. Above a level of 0,4 % copper the range of corrosion due to galvanic action within the structure of the metal increases rapidly.

## TECHNICAL INFORMATION

## Painting systems and their application.

Painting system = base material + surface finishing + paint layer

Painting system	Base material	Surface finishing	Paint type	No. of layers	Thickness of one layer in (µm)	Total thickness of the layers in (µm)	Applications	Maximum durability period
PS1	Standard Aluminium alloy • AK-93 lc • GD-ALSi9Cu3 No.226 • EN AC-ALSi9Cu3 EN AC - 46000	1.Vibration abrasive treatment in ceramic chips 2. Washing in alkalis	P	1	70	70	C2 → C3 →	H M
PS2			C	1	30	30	C2 → C3 →	H L
			E	1	70	70	C2 → C3 →	H L
PS3	Copper free Aluminium alloy • AK-11B lc • GD-ALSi12 No.230 • EN AC-ALSi12 mod EN AC-44200mod	1.Vibration abrasive treatment in ceramic chips 2. Washing in alkalis 3.Yellow chromating or chromium free , conversion treatment	P	1	70	70	C2,C3,C4→	H
PS4			C	3	30	90		L
PS5			E	1	70	70	C5-I →	L
PS6			SE				C5-M →	
		SE + SPU	1 + 1	70 + 50	120	C2,C3,C4→ C5-I → C5-M →	H M M	

## Application of painting systems

Painting system	Type of product	Ordering code	Status in the catalouge
PS 1	• Standard connection heads and housings • Increased safety	Standard , f.e. DAAD1 – M2A – 5X-NS-Psh DANA1-M2A-5X-NS-Cal	standard
PS 3 PS 4		Standard + ( S ), f.e. DAAD1–M2A – 5X-NS-Psh(S) DANA1-M2A-5X-NS-Cal(S)	Special on request. S=copper free aluminium EN AC-44200 mod + conversion layer ( f.e chromating)
PS 5	Flameproof „d”connection heads and hausings	Standard , f.e. XD-AD2–M2/CD–N2/10,1–SEsh	standard
	• Standart connection heads and hausings, • Increased safety	Standard + ( S ), f.e. DAAD1–M2A–5X-NS-SEsh ( S )	Special on request. S=copper free aluminium EN AC-44200 mod + conversion layer f.e.titanium-circonium
PS 6	Flameproof „d”connection headsand hausings	Standard , f.e. XD-AD2–M2/CD–N2/10,1–SPUbs	standard
	• Standart connection heads and hausings, • Increased safety	Standard + ( S ), f.e. DAAD1–M2A–5X-NS-SPUbs ( S )	Special on request. S=copper free aluminium EN AC-44200 mod + conversion layer f.e.titanium-circonium

## TECHNICAL INFORMATION

## Applications of painting systems

Painting system	Application	
	Indoor location	Outdoor location
PS1	<ul style="list-style-type: none"> <li>Offices, shops, hotels, schools</li> <li>Non heated buildings with mist condensation</li> <li>Production hall with great humidity and cocontamination f.e : food plants, breweris, cleamery</li> </ul>	<ul style="list-style-type: none"> <li>Country atmospheres , urban industrial atmospheres contaminate of sulphur oxide, caostal area with small ratio of salinity.</li> </ul>
PS2	As above	As above, but in shadow places
PS3	<ul style="list-style-type: none"> <li>As above, plus</li> <li>chemical plants, swimming pool, shipyards, repair shipyards</li> <li>buildings and area with almost continous mist condensation and great contamination</li> </ul>	<ul style="list-style-type: none"> <li>as above, plus</li> <li>industrial and caostal area with medium salinity,</li> <li>great huminidity and harmful atmoapheres</li> <li>desert areas</li> </ul>
PS4	As above, plus	As above – but in shadow places
PS5		
PS6	<ul style="list-style-type: none"> <li>As above, plus</li> <li>buildings and area with almost continous mist condensation and great contamination</li> </ul>	<ul style="list-style-type: none"> <li>as above, plus</li> <li>coastal areas and distant from the caost into sea with great salinity ratio,</li> <li>desert areas</li> </ul>

## Testing methods of painting systems (expected value)

Corrosion category	Durrabilty period	Chemical resistance in (h) ISO 2812-1	Water steam condensation in (h) ISO 6270	Neutral salt mist in (h) ISO 7253
C2	L	–	48	–
	M		48	
	H		120	
C3	L	–	48	120
	M		120	240
	H		240	480
C4	L	–	120	240
	M		240	480
	H		480	720
C5-I	L	168	240	480
	M		480	720
	H		720	1440
C5-M	L	–	240	480
	<b>M</b>		<b>480</b>	<b>720</b>
	H		720	1440

## TECHNICAL INFORMATION

### Several type of lacquer are used to paint bodies and covers of connection heads:

FEATURES		STANDARD	ON REQUEST			SPECIAL	
		POWDER P	POWDER P	POWDER E	SPRAY C	SPRAY SE	SPRAY SPU (painted on SE layer)
Colours:	Short sign						
alu – aluminium natural colour	al				•		
RAL 1003 signal yellow	ys					•	•
RAL 1007 chrome yellow	yc		•	•			•
RAL 5005 signal blue	bs		•	•			•
RAL 5015 sky blue	sb		•	•		•	•
RAL 7032 silicon grey	sg		•	•		•	•
RAL 7035 light grey	gr		•	•		•	•
RAL 9002 ashen grey white	ag		•	•		•	•
RAL 9006 shine	sh	•		•		•	•
RAL 9007 grey silver	gs		•	•			
RAL 9010 cream white	cw		•	•			•
Gloss ISO 2813		Gloss > 76 % ( 80 – 90% )			mat < 15%	Semi - gloss 60%	Semi - gloss 60%
finish		smooth					

### Corrosion category according to ISO 12944 – 2

Category Marking	Category Name	Layer thickness loss of carbon steel in (µm) ( during first year exposure)	Main features of environment
C2	small	1,3 - 25	Urban atmospheres with small ratio of sulphation
C3	medium	25 - 50	Urban and industrial atmospheres, medium contaminate of sulphur oxide.Coastal area with small ratio of salinity.
C4	heavy	50 - 80	Industrial area and coastal area with medium ratio of salinity
C5-I	Very heavy industrial	80 - 200	Industrial area with great humidity and harmful atmospheres
C5-M	Very heavy marine	80 - 200	Coastal area and distant from the coast into sea , with great salinity ratio
Durability of painting systems L – short, from 2 to 5 years M –medium, from 5 to 15 years H – long , over 15 years		Durability of painting systems is not guarantee period. Quarantee period is a legal regulation.There is no rules which connect the both regulation	

## TECHNICAL INFORMATION

## General features of different type of paints

O – excellent ▲ - good ● - bad	Main properties			
	Polyester	Epoxyd	Epoksyd + Polyurethane	Creodur
	P	E, SE	SE+SPU	C
Durability of glossy	▲	●	O	▲
Durability of colour	▲	●	O	▲
<b>Resistance against</b>				
Submergance in water	●	O	▲	O
Rain( water vapour condensation)	O	O	O	O
Solvents	▲	▲	●	▲
Solvents ( splash)	O	O	O	O
Acids	▲	●	●	▲
Acids (splash)	▲	▲	▲	▲
Alkalies	●	O	●	▲
Alkalies ( splash)	●	O	O	▲
<b>Temperature resistance in dry conditions</b>				
Up to 100°C	O	O	O	O
Up to 150°C	▲	▲	▲	O
Up to 200°C	●	●	●	▲
<b>Phisical properties</b>				
Erasure resistance	O	O	▲	●
Impact resistance	O	▲	O	O
Flexibility	▲	O \ ▲	O	▲
Hardness	O	O \ ▲	▲	▲
Resistance against temperature changes	O	●	▲	O
<b>Appropriation</b>				
Indoor location	Yes	Yes	Yes	Yes
Outdoor location	In darknes places	Yes	Yes	Yes
	Exposed on the sun	Yes	No*	Yes
* Not recomendad , after about 3 – 4 years can occurs yellowing ang chalking process.This cousted losing glossy and colour.				