

SACRIFICIAL ANODES

Aluminium anodes

Document No.: 05-300-R1

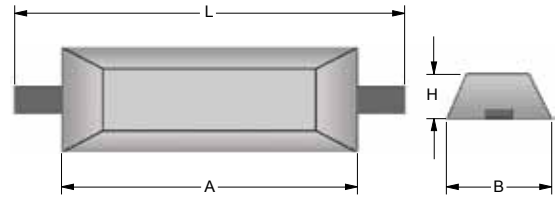
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German Cathodic Protection



Standard Aluminium Hull Anodes

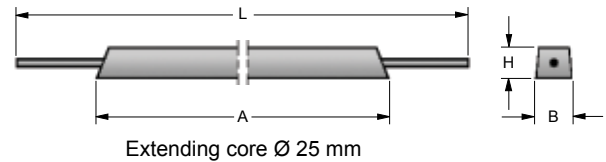
| Type | Anode weight kg | Aluminium weight kg | A mm | B mm | H mm | L mm |
|--------|-----------------|---------------------|------|------|------|------|
| 15 AI | 1.5 | 1.1 | 220 | 100 | 30 | 300 |
| 25 AI | 2.5 | 2.0 | 270 | 120 | 32 | 350 |
| 43 AI | 4.3 | 3.4 | 370 | 120 | 32 | 450 |
| 60 AI | 6.0 | 5.2 | 600 | 120 | 41 | 700 |
| 80 AI | 8.0 | 7.5 | 350 | 150 | 62 | 450 |
| 90 AI | 9.0 | 7.8 | 960 | 120 | 37 | 1060 |
| 114 AI | 11.4 | 10.6 | 600 | 120 | 76 | 700 |
| 170 AI | 17.0 | 15.8 | 960 | 120 | 73 | 1060 |
| 350 AI | 35.0 | 31.6 | 1920 | 120 | 71 | 2000 |



All types can be delivered for bolting. All weights and dimensions are nominal.

Standard Aluminium Anodes - Static Structures

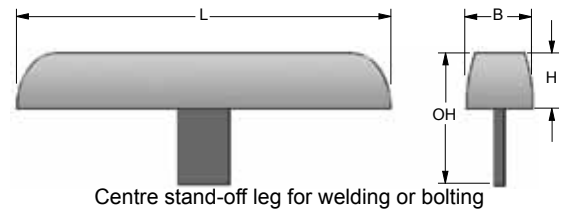
| Type | Anode weight kg | Aluminium weight kg | A mm | B mm | H mm | L mm |
|---------|-----------------|---------------------|------|------|------|------|
| 280 HAL | 27.3 | 21.5 | 1000 | 112 | 90 | 1500 |
| 385 HAL | 37.7 | 30.0 | 1400 | 112 | 90 | 2000 |
| 485 HAL | 47.7 | 40.0 | 1450 | 130 | 100 | 2000 |
| 516 HAL | 51.6 | 40.0 | 2015 | 110 | 85 | 3000 |
| 566 HAL | 56.6 | 45.0 | 2250 | 110 | 85 | 3000 |
| 585 HAL | 57.7 | 50.0 | 1500 | 140 | 110 | 2000 |
| 616 HAL | 61.6 | 50.0 | 2480 | 110 | 85 | 3000 |
| 625 HAL | 62.5 | 54.8 | 1500 | 140 | 120 | 2000 |



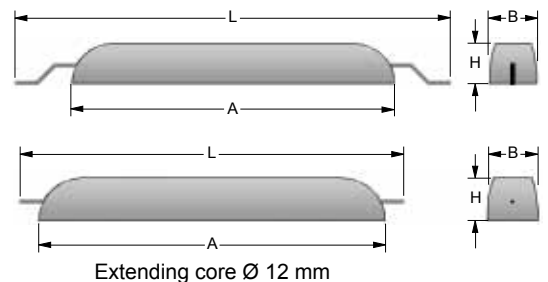
HAL Type anodes with variable lengths up to 2.5 m are available upon request. All weights and dimensions are nominal.

Standard Aluminium Tank Anodes

| Type | Anode weight kg | Aluminium weight kg | L mm | B mm | H mm | OH mm |
|--------|-----------------|---------------------|------|------|------|-------|
| 44 TAL | 4.4 | 3.8 | 400 | 70 | 60 | 140 |
| 96 TAL | 9.6 | 8.5 | 750 | 77 | 65 | 135 |



| Type | Anode weight kg | Aluminium weight kg | A mm | B mm | H mm | L mm |
|---------|-----------------|---------------------|------|------|------|------|
| 100 TAL | 10.0 | 8.7 | 1235 | 62 | 45 | 1415 |
| 125 TAL | 12.5 | 11.2 | 1235 | 68 | 57 | 1415 |
| 200 TAL | 20.0 | 18.4 | 1600 | 76 | 63 | 1780 |



All weights and dimensions are nominal and subject to variation in material compositions. Alternative configurations may be cast to requirements.

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Aluminium anodes

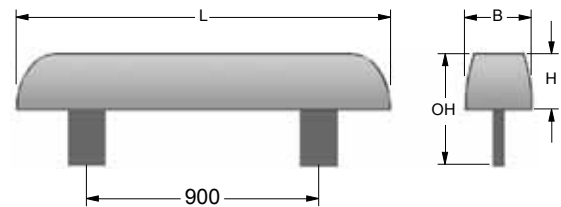
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German Cathodic Protection



| Type | Anode weight kg | Aluminium weight kg | L mm | B mm | H mm | OH mm |
|---------|-----------------|---------------------|------|------|------|-------|
| 105 TAI | 10.3 | 8.7 | 1235 | 64 | 51 | 145 |
| 130 TAL | 12.8 | 11.2 | 1235 | 68 | 58 | 145 |
| 160 TAL | 15.7 | 13.7 | 1600 | 70 | 52 | 145 |
| 200 TAL | 19.7 | 17.7 | 1600 | 76 | 63 | 145 |
| 230 TAL | 22.6 | 20.0 | 2100 | 74 | 56 | 145 |
| 320 TAL | 31.7 | 29.7 | 1600 | 95 | 84 | 165 |



Centre stand-off leg for welding or bolting

All anodes can be manufactured with double cranked insert. Other anode types can be manufactured according to requirements or specifications. All weights and dimensions are nominal and subject to variation in material compositions. Alternative configurations may be cast to requirements.

| Chemical Compositions and Electrochemical Properties | | |
|--|---|--|
| | BERALIN ALLOY | BECALIN ALLOY |
| Zn | 3.5 - 6.5 % | 3.5 - 6.5 % |
| In | 0.01 - 0.03 % | 0.01 - 0.03 % |
| Mn | 0.01 % max. | 0.1 - 0.25 % |
| Fe | 0.13 % max. | 0.22 % max. |
| Si | 0.10 % max | 0.10 % max. |
| Cu | 0.006 % max. | 0.01 % max. |
| Al | remainder | remainder |
| Closed circuit potential | -1100 mV vs Ag/AgCl | -1120 mV vs Ag/AgCl |
| Current capacity | max. 2680 Ah/kg | max. 2550 Ah/kg |
| Efficiency | 90 % | 86 % |
| Consumption | 3.27 kg per A/year | 3.45 kg per A/year |
| Special advantages | High current capacity, especially suited to applications where low anode weights are desirable, e.g. offshore structures. | High driving voltage, especially suited to applications where water resistivity precludes the use of standard aluminium alloy. |