

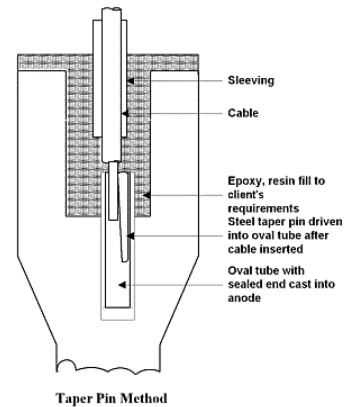


Silicon Iron Anodes Data Sheet

The **pml** range of Silicon Iron anodes is manufactured from high silicon cast iron alloy. The anodes are designed for the effective protection of steel pipelines and structures from corrosion.

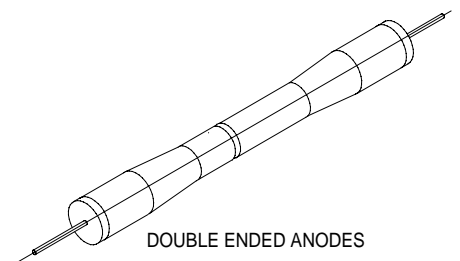
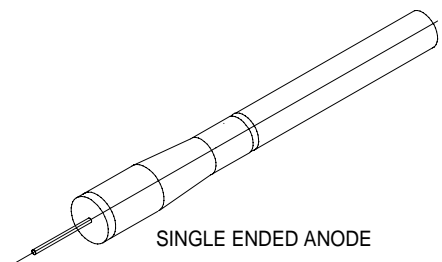
Single Ended Anodes

Anode Dia. mm	Head Dia. mm	Length mm	Weight kg	Nominal Current for 20 year life @ 10A/m ²
75	100	900	32	2.1
75	100	1200	41	2.8
75	100	1500	50	3.5
75	100	1524	51	3.6
65	90	900	20	1.8
65	90	1200	27	2.5
65	90	1500	34	3.1
50	75	900	13	1.4
50	75	1200	18	1.9
50	75	1500	21	2.4



Double Ended Anodes

Anode Dia. mm	Head Dia. mm	Length mm	Weight kg	Nominal Current for 20 year life @ 10A/m ²
75	100	900	36	2.1
75	100	1200	45	2.8
75	100	1500	54	3.5
65	90	900	23	1.8
65	90	1200	30	2.5
65	90	1500	37	3.1
50	75	900	15	1.4
50	75	1200	20	1.9
50	75	1500	24	2.4
50	75	1524	24.5	2.4



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Two grades of Silicon Iron are in general use for Cathodic Protection. Type N are generally used for all land based applications and type C are used for marine and high chloride applications

Composition

	Type N	Type C
Silicon	14.50%	14.50%
Manganese	0.75%	0.75%
Carbon	0.85%	0.95%
Chromium	-	4.50%
Iron	Balance	Balance

The following standards for corrosion resistant silicon iron castings apply :

BS 1591 1975
ASTM A518-80

Anode Cable Connections

Anode to cable connections are normally made using a tapered pin inserted into an oval tube and encapsulated in epoxy resin. Alternative connections are available to suit specific requirements - typically lead caulked or cast-in studs.

Cables

Anodes are normally supplied with 10mm² XLPE/PVC sheathed cable tails. Tail lengths are supplied to suit Clients requirements and other cable types may be specified. Anode/cable connections are resin sealed to ensure water-tightness.

Anode Caps

To counteract "end effect" cross-linked polyethylene anode caps may be fitted. These are heat shrink and fitted over anode / cable connection.

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Tubular Cast Iron Anodes

All conventional impressed current anodes are consumed with time. With tubular cast iron anodes, however, effective protection is provided at a low and very uniform consumption rate. The anodes are made using the high silicon iron alloy to BSS 1591 or to ASTM A 518-80, Grade 2, which is consumed at a rate of 0.2 to 0.5 kg/amp-yr. in seawater. This material also permits an operating current density of approximately 10-30 amp/m² in soil or freshwater and 10-50 amp/m² in seawater. To form these anodes, a centrifugal casting is employed. Using this technique, the anodes are spun during casting to exert pressure. This pressure gives the anodes a denser, more homogeneous surface that is resistant to deterioration. In addition to chemical composition and casting techniques, the configuration of tubular anodes also contributes to improved operating performance. Their tubular design provides greater surface area over solid cast iron anodes of identical weight. This in turn lowers anode-to-earth resistance, decreases the current density on the surface of the anode, and permits any generated gases to be distributed over a larger area. The tubular design also means the wire connection can be made in the center of the anode, thus eliminating the problem of end-effect consumption. In tubular cast iron anodes, a wedge connection is used.

Chemical Composition

Element	ASTM A 518-80 Grade 2 Content %
C	0.5 – 14.75
Mn	1.5 max
Si	14.2 – 14.75
Cr	3.25 – 5.0
Mo	0.2 max
Cu	0.5 max
Iron	Remainder

Standard Dimensions and Shipping Weights

Type & Ref No	Weight Kg	Approx Area m ²	Current output @10mA/m ²	OD mm	ID mm	Length mm
MS-1	14.1	0.2	2	68	46	1067
MS-2	20.9	0.4	4	56	36	2134
MS-3	28.6	0.5	5	68	46	2134
MS-4	38.6	0.6	6	96	74	2134
MS-5	49.9	0.8	8	122	99	2134
MS-6	79.4	0.8	8	122	86	2134

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Canister Anodes

For direct burial, any of the above single ended anodes, surrounded by compacted carbonaceous breeze backfill, can be supplied within a spirally welded steel canister. These are particularly suitable for use in low resistivity soils, vertical installation in augered holes or where the construction of an open groundbed trench, in wet and marshy environments may be difficult. They will reduce installation costs by providing the anode and coke backfill in a self contained package.

The coke backfill provides a homogenous environment for the impressed current anodes and can substantially lower the anode to earth resistance. Canisters ensure the anodes are evenly surrounded with the proper amount of coke breeze backfill.

The canisters may be supplied in a variety of diameters and lengths to suit the specific anode/groundbed design.

The canistered anode may also be a mixed metal oxide anode where higher current outputs are required.



For further details, prices and delivery please contact Pipeline Maintenance Limited at the address shown below.

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