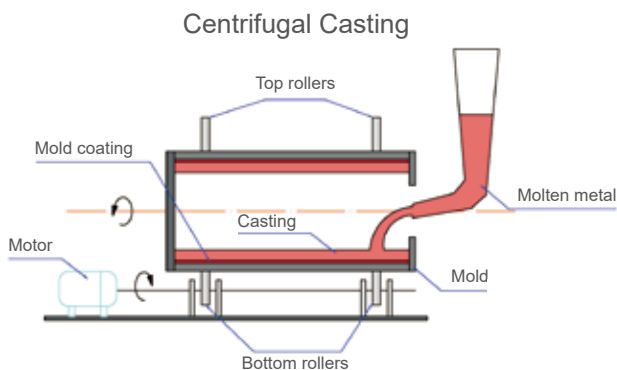


HSCI Tubular Anodes (TA Series)

Jennings Anodes has been a leading supplier of High Silicon Cast Iron for over 40 years. We manufacture our Anodes in the UK (Jennings Foundry) with a combined production capacity of 3000T per year. (Jennings Foundry previously manufactured all the Durichlor-51 Anodes.) Our depth of knowledge and experience enables us to provide a comprehensive range of HSCI anodes in Tubular form to the highest of standards, meeting X-Ray Level 1 as per ASTM E186/E446, Chemistry to either ASTM A518-99 Gr 1 or 3.

Production Process (Centrifugal Casting)

Jennings Anodes Tubular HSCI anodes are manufactured using a Centrifugal Chill Cast Method. No other method consistently produces tubular anodes with a superior metallic structure than this proven route.



Product Features

1. Casting Integrity Achieved Through One Directional Solidification

Jennings Anodes Tubular HSCI anodes are manufactured using a Centrifugal Chill Cast Method. No other method consistently produces tubular anodes with a superior metallic structure than this proven route.

2. Impact Resistance & Improved Handling

The centrifugal casting in a chill or steel mold ensures greater density and integrity resulting in a stronger anode with improved impact resistance helping to avoid anode breakage during handling and installation.



Image shows fine graphite area of Centrifugal HSCI (Magnification x 50)

3. A Low Consumption Rate

Coarse stippled effect on the outer surface leads to a large surface area in comparison to anode weight thus reducing the anode current density giving 30% more amp-years than conventional stick anodes.



4. Longer Life Expectancy

Excellent performance proven by 3rd Party Accelerated Corrosion Testing. (Presentation NACE 2018 Mr C.D. Jennings - MSL Report). Refer to Website.

5. Low Cable Connector Resistance

A low resistivity (Less than 0.001 Ohms) Zinc Wedge-lock center connection ensures a balanced spread of current throughout the length of the anode, extending the life of the anode and resulting in a reliable current discharge to the surrounding environment. The connection is resin encapsulated using a high-quality Epoxy Resin to ensure eradication of moisture ingress.



6. Ease Of Connection

A unique cable connection device can be provided for easy and efficient installation, (200 pcs can be connected by 2 people in less than 8 Hours).

7. Stability of Pricing

Unlike MMO Anodes the raw materials for FeS are not prone to violent fluctuations in price enabling FeSi anodes to offer a stable cost structure.

Applications

High silicon cast iron anodes are used for a variety of impressed current cathodic protection (ICCP) applications including deep well systems, shallow installations and grounding.



Chemical Composition

Element	ASTM A518-99 (2012)		BS 1591 1975
	Grade 1 (Si-Fe)	Grade 3 (Si-Fe-Cr)	
Carbon	0.65~1.10%	0.70~1.10%	1.40% Max.
Manganese	1.50% Max.	1.50% Max.	0.50% Max.
Silicon	14.20~14.75%	14.20~14.75%	14.25~15.25%
Chromium	0.50% Max.	3.25~5.00%	0.50% Max.
Molybdenum	0.50% Max.	0.20% Max.	~~
Copper	0.50% Max.	0.50% Max.	~~
Sulphur	~~	~~	0.10% Max.
Phosphorus	~~	~~	0.25% Max.
Iron	Remainder	Remainder	Remainder

Electrochemical Properties

Environment	Nominal Current Density	Consumption Rate	Note
Soil / Fresh Water	2.0 - 5.0 A/m ²	0.1 - 0.5 kg/A-y	Avoid: Dry Soils High PH Value High Sulfate Consider during design: End Effect Brittle Chrome Alloy - Chloride Environment
	0.2 - 0.5A/ft ²	0.2-1.2 lbs/A-y	
Carbon Backfill	5.0 - 10A/m ²	0.05 - 0.3 kg/A-y	
	0.5 - 1.0A/ft ²	0.1- 0.7 lbs/A-y	
Seawater	10 - 50A/m ²	0.3 - 0.5 kg/A-y	
	1.0 - 5.0A/ft ²	0.7 -1.0 lbs/A-y	

Impressed Current Anodes HSCI Tubular Anodes

Product Specification - Ta Series

Anode Model	Anode Weight	Diameter	Overall Length	Surface Area
JA - 60 - TA2S	32.80lbs (14.90kg)	Φ2.28" (58mm)	60" (1524mm)	3.0sq.ft. (0.28m ²)
JA - 60 - TA3S	44.90lbs (20.40kg)	Φ2.80" (71mm)		3.6sq.ft. (0.34m ²)
JA - 60 - TA4S	61.70lbs (28.00kg)	Φ3.80" (97mm)		5.0sq.ft. (0.46m ²)
JA - 60 - TA5AS	124.90lbs (56.70kg)	Φ4.80" (122mm)		6.3sq.ft. (0.59m ²)
JA-42-TA2 XS	23lbs (10.5kg)	Φ2.3" (58mm)	42" (1067mm)	2.1sq.ft. (0.193m ²)
JA-42-TA3 XS	31lbs (14.1kg)	Φ2.8" (71mm)		2.4sq.ft. (0.25m ²)
JA-42-TA4 XS	43.2lbs (19.6kg)	Φ3.8" (96mm)		3.5sq.ft. (0.3m ²)

Anode Model	Anode Weight	Diameter	Overall Length	Surface Area
JA - 84 - TA2	46.30lbs (20.90kg)	Φ2.28" (58mm)	84" (2133mm)	4.2sq.ft. (0.39m ²)
JA - 84 - TA3	63.05lbs (28.60kg)	Φ2.80" (71mm)		5.1sq.ft. (0.48m ²)
JA - 84 - TA4	86.00lbs (39.20kg)	Φ3.80" (96mm)		6.9sq.ft. (0.64m ²)
JA - 84 - TA5A	175.00lbs (79.50kg)	Φ4.80" (122mm)		8.8sq.ft. (0.82m ²)

All weights and dimensions are nominal and subject to variation in material compositions and Jennings Anodes foundry tolerance.

Anode Configuration

Can be supplied as bare anodes or with cable connected. They can also be supplied in Galvanized Steel Canisters with Coke Backfill if required.

Impressed Current Anodes

HSCI Tubular Anodes



Quality Assurance & Testing

Quality Assurance and Quality Control procedures are employed and strictly implemented to guarantee the performance of the anodes. Chemical integrity is ensured by pre and post casting sampling. All Anodes can be individually stamped for full traceability and identification. Full test reports are enclosed with the customer's shipping documents.

Testing	Chemical Composition	Physical Appearance
Standards & Methods	ISO 9001:2015 Quality Management System and Foundry Internal Standards for HSCI Tubular Anodes	
	ASTM E350	ASTM E186 / E446, Foundry ITP
Testing Items	Chemical Analysis	Anode Surface, Finish and Appearance (Oxide Slag, Internal Shrinkage, Gas Porosity, Surface Crack, Non-metallic Inclusion etc.) Anode Size, Unit Weight Lead Wire / Cable Specification, Pulling Tension of Lead Wire / Cable connection Epoxy Resin Sealing, Connection Resistance, Drop Impact test etc.
Equipment & Devices	Optical Emission Spectrometer Labspark 750A, Thermoscientific Niton XL2-980	Calibrated Digital Measuring Devices

Anode Model	Unit of Measurement	Bare Anode Packing Details				
		Number of Anodes per Crate/Pallet	Crate/Pallet Dimension	Net Weight	Gross Weight	Number of Crates/Pallets per 20ft. Container
JA - 60 - TA2S	EA	63	63" x 26" x 27.5" (1600 x 650 x 700mm)	2072lbs (945kg)	2194lbs (1005kg)	21
JA - 60 - TA3S		48	63" x 27" x 27.5" (1600 x 690 x 700mm)	2161lbs (985kg)	2304lbs (1050kg)	20
JA - 48 - SA4S		36	63" x 27" x 33" (1600 x 690 x 850mm)	2227lbs (1008kg)	2370lbs (1075kg)	20
JA - 60 - TA5AS		16	63" x 24" x 29" (1600 x 600 x 730mm)	2006lbs (910kg)	2127lbs (965kg)	22

Impressed Current Anodes HSCI Tubular Anodes

Anode Model	Unit of Measurement	Bare Anode				
		Number of Anodes per Crate/Pallet	Crate/Pallet Dimension	Net Weight	Gross Weight	Number of Crates/Pallets per 20ft. Container
JA - 84 - TA2	EA	63	87" x 26" x 27.5" (2210 x 650 x 700mm)	2910lbs (1323kg)	3075lbs (1395kg)	15
JA - 84 - TA3		48	87" x 27" x 27.5" (2210 x 690 x 700mm)	3031lbs (1390kg)	3197lbs (1465kg)	15
JA - 84 - TA4		34	87" x 27" x 33" (2210 x 690 x 850mm)	2954lbs (1340kg)	3120lbs (1415kg)	15
JA - 84 - TA5A		25	87" x 24" x 29"	2822lbs	2998lbs	16

Custom packing is available upon request.

Shipping Documents

1. Proforma Invoice
2. Shipping Invoice
3. Testing Reports (Chemical Composition, Electrochemical Properties Test, Certificate of Compliance)
4. Others upon request (Certificate of Origin etc.)