



PPS-001

Revision E

TITLE: AXF-5Q and AXF-5Q1

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<u>ISSUE DATE</u>	<u>REV.I.D.</u>	<u>BRIEF DESCRIPTION OF CHANGES</u>
02/85	A	Document Release.
05/86	B	Revised to New Format
06/87	C	Revised Material Properties
11/94	D	Updated Section 4.1; deleted Section 4.3
01/04	E	Revised to New Format



PPS-001

Revision E

1.0 SCOPE

This specification defines the material for AXF-5Q and AXF-5Q1 grades of graphite furnished by POCO Graphite, Inc. (POCO).

2.0 MATERIAL CHARACTERISTICS

2.1 Material Properties **Note Test Level Definitions Given at Bottom of Page**

	<u>PROPERTY</u>	<u>UNIT</u>	<u>MIN.</u>	<u>MAX.</u>	<u>TEST LEVEL *</u>
2.1.1	Flexural Strength	psi	11,500 **	--	II
	Compressive Strength	psi	18,200	--	II
	Electrical Resistivity	$\mu\text{-}\Omega\text{-in.}$	470	625	II
	Shore Hardness	Unitless	70	79	II
	Apparent Density (A.D.)	g/cm^3	1.77	1.88	I
	C.T.E.	$\times 10^{-6}/^{\circ}\text{C}$	7.3	8.9	III
	Ash (AXF-5Q)	ppm	300	3,000	IV
	Ash (AXF-5Q1)	ppm	0	5	II
	Oxidation Threshold (AXF-5Q)	$^{\circ}\text{C}$	450	500	IV
	Oxidation Threshold (AXF-5Q1)	$^{\circ}\text{C}$	580	590	IV

*TEST LEVEL

** Set at -1.3 SD

TESTING FREQUENCY

I	The whole billet (a single block of graphite) is tested for the property in question. The values shown are the acceptance limits.
II	Each batch (a group of billets from a single, identifiable blend of raw materials) or process lot (a collection of billets handled as a single unit through an identifiable process step) is sampled. The values shown are two standard deviations from the mean of all tests done.
III	Every batch or process lot is not tested. However, statistical analyses have been made and the values shown are two standard deviations from the mean of those tests that have been done. POCO does not certify that these values apply to each or any process lot, batch, billet, or piece of material that it supplies.
IV	Every batch or process lot is not tested. These values are the extremes that have been detected in the testing that has been done. POCO does not certify that these values apply to each or any process lot, batch, billet, or piece of material that it supplies.

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2.2 Material Composition

2.2.1 Physical Composition

AXF-5Q and AXF-5Q1 are isotropic graphites. The typical particle size is ≤ 5 microns. The typical pore size is 0.8 microns and the typical open porosity is 78% (both by mercury porosimetry). No specification limits are set for these properties.

2.2.2 Chemical Composition Characteristics

2.2.2.1 Standard Material Purity

AXF-5Q is at least 99.7% carbon with 0.3% impurities by ash analysis.

2.2.2.2 Specialty Purified Materials (Optional at higher cost.)

Purified AXF-5Q is given the grade designation AXF-5Q1 and has a 5 ppm or less impurity level by ash analysis.

3.0 DISCLAIMER OF EXPRESS OR IMPLIED WARRANTIES

EXCEPT AS EXPRESSLY SET FORTH HEREIN, POCO GRAPHITE, INC. ("POCO") EXPRESSLY DISCLAIMS AND BUYER EXPRESSLY WAIVES ALL WARRANTIES, EXPRESS OR IMPLIED, including any implied warranty of *MERCHANTABILITY* under section 2.314 of the Texas Business and Commerce Code and any implied warranty of ***FITNESS FOR A PARTICULAR PURPOSE*** under section 2.315 of the Texas Business and Commerce Code and any other warranty pursuant to section 2.313 of the Texas Business and Commerce Code.

4.0 TRACEABILITY OF MATERIALS

At appropriate points throughout the manufacturing process, POCO identifies its product to ensure that traceability is maintained throughout the production process. Various levels of traceability may be provided as an agreed upon requirement by the customer's purchase order.

5.0 CERTIFICATION

POCO will certify only that AXF-5Q and AXF-5Q1 material is manufactured in accordance with internal specifications and controls that produce material having the properties as defined in Section 2.0. No other data, samples, or records will be provided. Historical data on material will be maintained by POCO strictly at its own discretion and for its own purposes. Data on processes, controls, and other proprietary items will not be made available.