

Foundry Products by:



We Meet Your Specifications and Exceed Your Expectations.

Asbury Carbons manufactures and supplies products for every step of the casting, forging, extrusions and forming processes.

You have challenges... we offer solutions.

THE MANUFACTURER AND SUPPLIER OF CHOICE

Asbury Carbons is known worldwide for its premier products for number of applications. Continuing to be a top choice, by offering a full line of carbon and non-carbon products along with technical support and custom product design for your next project. Our products range from standard powdered grades to pelletized products that are low dust and help to keep our customer's plants clean and safe, which is something that ties back to our Core Values.

THE MANUFACTURER AND SUPPLIER OF CHOICE

When it comes to carbon and non-carbon products for a wide and diverse range of industries and applications, Asbury Carbons gives you all the advantages:

- Offering the largest selection of high quality products.
- Shipping from conveniently located facilities in North America, and Mexico and from warehouses in Europe and Asia.
- Engaging in worldwide network of distributors to keep freight cost lows.
- Making overseas shipments available from East, West, & Gulf ports.
- Offering packaging choices that include drums, bags, bulk sacks, bulk trucks, and bargs.
- Offering custom processing and packaging.

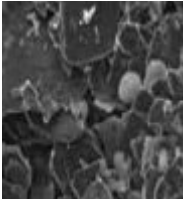
GRAPHITE IS ESSENTIAL!

The applications Asbury's products go in to are essential for everyday living. Graphite and carbon products are added to molten iron during the melt cycle to increase strength and machinability of the end-state material. Some of the iron products that use Asbury grades go into automotive items such as engine blocks and brake rotors while other applications are more civic and infrastructure-minded, like manhole and storm drain covers and fire hydrants, which are made by customers like Kennedy Valve.



Natural Flake

Particle Size: 20 mesh - 1 μ m
Carbon Content: 70-99.9%



is a naturally occurring form of graphite. Its properties include high thermal and electric conductivity, and low spring-back (excellent molding characteristics). Flake graphite is used in many applications including powder metallurgy, fuel cell bipolar plates, coatings, thermal materials, friction moderators, electrically conductive materials, refractories, general lubricant applications, pencils, gaskets, rubber compounds and other advanced polymer systems.

Natural Amorphous

Particle Size: 5" - 1 μ m
Carbon Content: 70-88%



Amorphous graphite is a naturally occurring seam mineral formed from the geological metamorphism of anthracite coal. It's called "amorphous" because to the naked eye, macroscopic graphite crystals are not visible. This form of graphite has a "granular/chunky" appearance.

Synthetic Conventional

Particle Size: 3/8" - 1 μ m
Carbon Content: 98-99.9%



Synthetic graphite is manufactured by the high temperature heat treatment of certain amorphous carbon precursors. Ultra-high process temperatures ensure purities higher than 99 percent and full graphitization, resulting in graphite materials with high thermal and electrical conductivity. Calcined needle coke is the primary parent carbon used to manufacture synthetic graphite, which explains the highly acicular morphology observed in this material.

Synthetic Isotropic

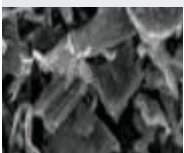
Particle Size: 5" - 1 μ m
Carbon Content: 98-99.9%



Isotropic synthetic is generally manufactured using very fine isotropic precursor carbons, giving the final graphite particles isotropic properties. This graphite can have a "blocky/chunky" mass appearance.

Synthetic High Purity

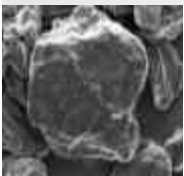
Particle Size: 3/8" - 1 μ m
Carbon Content: 98-99.9%



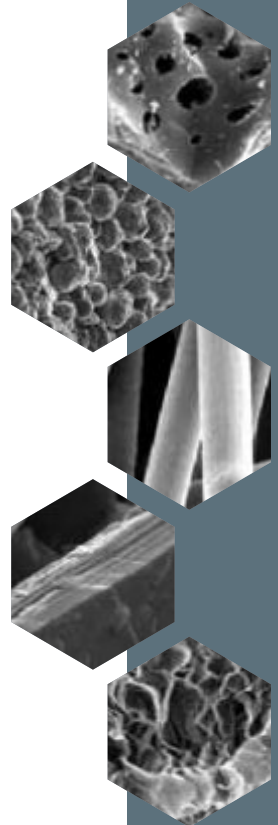
Ultra-high processing temperatures ensure purity higher than 99 percent. High Purity synthetic is made without the use of a binder phase.

Synthetic Graphco

Particle Size: 2" - 1 μ m
Carbon Content: 98-99.9%



Graphco is a unique material manufactured by a proprietary continuous thermal process. Using only the highest quality petroleum coke, Graphco is thermally engineered to provide a consistent, high-purity product. The Graphco manufacturing process results in semi-graphitic carbon with low compressibility, which is effective in products and processes that require a powder or granular graphite with high resiliency.



Carbobread
Coarse

Coarse
Flake

Corbobread
Medium

Pellets

Graphite
Lumps

Metallurgical
Coke



COKES, CARBONS, SHAPES

Petroleum Coke

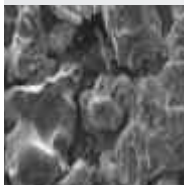
Particle Size: 20 mesh - 1 μm
Carbon Content: 97-99%



A manufactured carbon product that results from the thermal processing of residual oil. Temperatures from 1300 - 1400 degrees C removes virtually all residual hydrocarbons and moisture, ensuring exceptional purity. Petroleum coke is used in applications where high quality, non-graphitic carbons are required including re-carburizers, foundry carbons raisers, cover carbons and reducing agents.

Metallurgical Coke

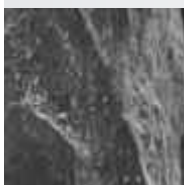
Particle Size: 5" - 1 μm
Carbon Content: 75-88%



Metallurgical coke (met coke) is manufactured by the destructive distillation of bituminous coal, resulting in a low volatile material. Metallurgical coke is used where a high-quality, tough, resilient, high-wearing carbon is required.

Anthracite Coal

Particle Size: 2" - 10 μm
Carbon Content: 75-90%



Anthracite coal (hard coal) is a naturally occurring low-ash, low volatile, homogeneous coal with a high BTU value. It is used in products and processes where a low conductive, low-cost, black mineral filler is required.

Activated Carbon - Coal

Particle Size: 12x40 - 200 mesh
Carbon Content: 80%



Coal-based activated carbon has a wider ranged pore structure. Softer than in its coconut shell counterpart, it is suitable for gaseous treatment applications and treatment of liquids such as wastewater.

Activated Carbon - Coconut Shell

Particle Size: 20x50 mesh - 4 μm
Carbon Content: 70-99%



Coconut shell activated carbon has the smallest pore structure of all conventional activated carbons. Coconut shell carbons are often used for vapor absorption applications.

Activated Carbon - Wood

Particle Size: -325 mesh
Carbon Content: 90%



Often made from wood pulp and then activated either chemically or via steam, wood-based activated carbon has the largest pore structure, allowing it to be highly effective absorbent agent suitable for use with aqueous solutions in applications such as decolorizing via the removal of organic dyes.

Graphite Shapes - *Molds, Plates, Rods*

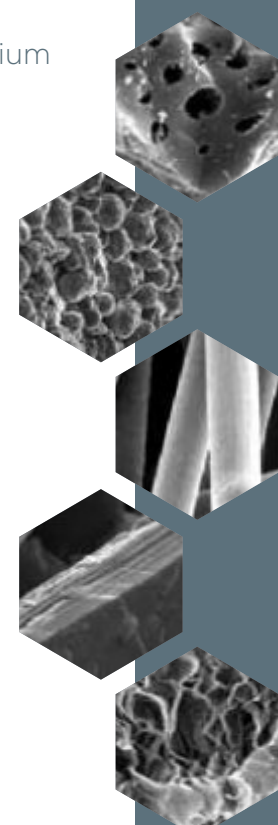


Synthetic graphite can be manufactured using precursor carbons of various grain size and morphology. Manufactured items include cubes, cylinders, rings, and various prismatic monolithic forms. During processing, grain sizes can be adjusted, along with particle orientation, to form shapes with either isotropic and anisotropic properties. A range of materials with increasing strength and density are available. Graphite shape can be custom machined to close tolerances into virtually any configurations.

Please contact canadainfo@asbury.com today, for the solutions of tomorrow.

MODIFIERS, GRAIN REFINERS and DEGRASSERS

Asbury Wilkinson offers titanium/boron additives for refining, as well as strontium alloys for modifying aluminum. Other metallic alloys are available, such as silicon metal and manganese flake. Our Tizox products are the most economical way to introduce titanium to hot metal. We also offer nucleating and degassing tablets as well as tablets for introducing gas back into the metal. Master Alloys for modifying and refining are also available in various forms. Chlorine- and nitrogen-based degassers are formulated for multifunctional needs, including oxide removal, furnace cleanliness, and the improvement of microstructure by grain refinement and/or silicon modification.



Alloys & Metals

Chrome	FeW	Pig Iron
Copper Chops	HCFeCr	Silicon Carbide
75% FeSi	LC Steel	Silicon Metal
Fe Manganese	LCFeCr	SiMn
FeMo	LCFeMn	Tin
FeNb	Maganese Flake	Tungsten
FeSi	MgFeSi	Zinc
FeTi	Moly	
FeV	Nickel	

Master Alloys

Tibor	3/1	5/1	-
Strontium	10%	15%	20%
Phos Copper Shot	15%		
Manganese - Aluminum	50%		
Magnesium Bells	99%		
Aluminum Deox Shot			

Tizox Grain Refiners

Tizox	Ti %	B%	Ti:B	Note
161	16	1	16:1	High Flux, multipurpose
322	32	2	16:1	Good fluxing action, grain refiner
323	32	2	16:1	Sodium-free version of 322
401	40	1	40:1	Grain refiner, cleaner, good solution rate
404	40	4	10:1	High boron ratio, sodium free
501	50	1	50:1	Strong cleaning action
604	60	4	15:1	No flux, sodium free
750	75	0	-	Higher titanium, moderate cleaning
751.5	75	1.5	50:1	Less flux, sodium free
950	95	0	-	Little flux, high titanium
980	98	0	-	Commercial-purity titanium
999	20	4	5:1	Grain refiner, metal cleaner, fast acting, sodium free

Degassers Formulations

Degasser	Note
#185	Use with high-conductivity aluminum oron high-manganese-content alloys
#190	Active degassing action and grain refinement
#450	Effective degassing/cleaning agent, slow dispersal
#601	Easy application, low smoke
#752	Effective degassing/cleaning agent, low smoke

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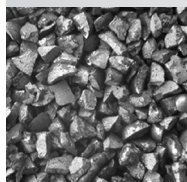
Cast, Steel Shot & Grit

With an ideal microstructure for steel shot, our Ervin AMASTEEL Abrasive Shot and Grit offers the best consistency on hardness levels and typically performs 10-15% more effectively than the competition. At 40-51 on Rockwell C scale, we also provide hardness levels including "M" (47-56 RC), "L" (54-61 RC) and "H" (minimum 60 RC), all engineered to industry standards.

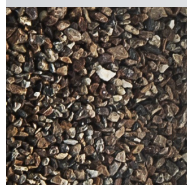
Plus, our stringent standards on voids and density means your products will be solid and last longer. Offered in steel, stainless steel, and mil specs.

**Recycled - Steel Shot & Grit**

Recycling services are also available for all spent materials upon request.

Conditioned Cut Wire

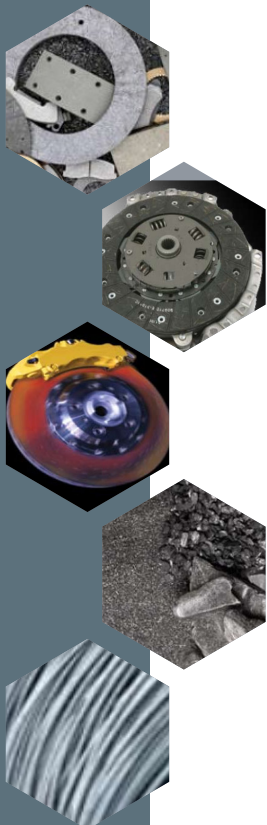
Carbon steel cut wire shot conditioned (rounded) is a premium peening abrasive that has a useful life up to three times longer than cast steel shot. It can also be precisely sized. Since conditioned carbon steel shot has a significantly longer useful life than cast steel shot or grit (two to three times), this reduces the amount of waste produced by blasting operations.

Jetmag - Synthetic Olivine

Blasting sands are non-toxic and are not listed as a hazardous material under the WMHIS. The synthetic sands generate little dust, is safe for the user and its work place, and is environment friendly and contains less than 1% of free silica, no heavy metals and no toxic elements. Designed to be recycled and re-used 3 - 4 times. Its weak density (specific weight) means a higher quantity of material (volume) for a given weight. 34 % more product than with iron silicate! 46 % more product than with garnet!

Aluminum Oxide

V-Blast Brown Fused Aluminum Oxide is a Virgin Brown Fused Aluminum Oxide (VBFA) that has been crushed (using ONLY certified crude) and screened to meet industry specifications. VBFA is made from a mixture of calcined bauxite (alumina), coke, and iron fillings. The mixture is fused at 2000°C and reduced to remove undesirable oxides. After cooling and solidifying, the resulting aluminum oxide is processed into a full range of grit sizes.



Graphite



Asbury Carbons has tapped the full potential of graphite, a highly versatile material that possesses a wide range of unique properties. Graphite, a high-performance solid lubricant, resists extreme temperatures and pressures, while acting as an efficient conductor of heat and electricity. Our expert technical support and custom product design enable us to meet our customers' most exacting requirements across a broad line of specialty lubricants. Each product delivers unparalleled performance, even in the most demanding applications.

Types of Coatings



Asbury's metalworking coatings and specialty products are recognized worldwide as premier products for non-ferrous metalworking applications — offering excellent adherence, heat conduction with a low coefficient of expansion, and pressure resistance.

- Graphokote** — High-purity graphite lubricants; resistant to high temperature, pressure and chemical conditions; water-, oil- and solvent-based binder formulations..
- Aquakast** — Water-based graphite coatings specifically developed for high-temperature and high-wear applications.
- Borokote** — Water-based formulated boron nitride dispersion used in cast house and foundry applications.
- Kaskote** — Water-based bone ash coating that provides high heat transfer, fills in small voids, has excellent non-wetting properties and has low reactivity with metals. Also available in powder form.
- Zircon** — Ceramic water-based protective coating, both liquid and dry to prevent molten metal adhesion on ladels, thermocouple tubes, and additional ferrous

Boron Nitride



A highly versatile synthetic material with similar thermal conductivity and lubricating properties as graphite. Hexagonal boron nitride (hBN) is the crystalline powder often referred to as "white graphite." Boron nitride offers high-temperature resistance, is virtually chemically inert, and is electrically resistive for applications where graphite's conductivity is problematic. These products are available as thoroughly de-agglomerated platelets and customizable agglomerates.

Borokote, our proprietary line of high performance boron nitride coatings, is ideal for applications where extreme temperature resistance is required from a lubricant or release coating. We also offer a tinted Borokote with a high-temperature indicator for easy visibility on white ceramic substrates.



Insulating and Exothermic Riser Sleeves

Offering both CF Series of insulating riser sleeves and CFX series of exothermic riser sleeves to provide the foundry with a reliable cost effective approach for optimizing feeding efficiency, improving quality, and lowering cost. Stringent manufacturing procedures and quality control standards ensure that your risering needs will be met on a continual basis.

Both these series feature a wide variety of standard riser sleeve shapes and sizes. We also have internal tooling capability, so prototypes of custom shape and sizes can be produced quickly. Costs to prove out new designs are minimized. Scale up time to full production can be greatly reduced.

BENEFITS:

- Reduction of heat loss allowing smaller risers to be used
- Improved casting yield
- Reduction of melting and cleaning room costs
- Reduction of piping and shrinkage
- Maintain integrity - will not contaminate sand system
- Improved soundness of castings
- Light weight yet strong compositions to withstand molding forces
- Low smoke and fumes
- Reduction of remelt volumes
- Easily modified to create special feeding effects while maintaining thermal performance



OFFERED SHAPES

LOW PRESSURE:

• Low Density Insulating & Exothermic Straight Sleeves

- Reduction of heat loss allowing smaller risers to be used
- Improved casting yield & improving soundness of castings
- Reduction of melting, cleaning room costs, piping and shrinkage
- Maintain integrity - will not contaminate sand system
- Light weight yet strong compositions to withstand molding forces
- Low smoke and fumes, while reducing remelt volumes
- Easily modified to create special feeding effects while maintaining thermal performance



• Round Neckdowns Sleeves and Collars

- Reduce contact area to facilitate riser removal
- Eliminate need for metal padding of casting to accommodate riser
- Eliminate need for breaker cores & Reducing metal volume while maintaining head height
- Available with embedded woven cloth to further facilitate riser removal

• Blind Risers - Insulating and exothermic blind riser sleeves offer the following advantages:

- Reduction of heat transfer compared to sand risers, allowing the use of smaller riser heads & Reduced casting contact area for easier removal
- Reduction of piping and shrinkage
- Manufactured to closely controlled external dimensions to allow insertion into a preformed mold cavity
- Ideal for high production applications & Contain a "wedge style" firecracker core
- Customizable: Available with 40% or 50% breaker core & can be gauged to specific heights per your application

HIGH PRESSURE:

• Domes & Exothermic - Tops

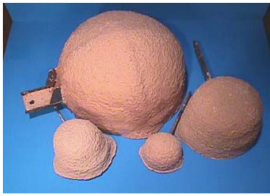
• Pour Sprues and Cups - These pouring aids provide the metalcaster an economical means to ensure a smooth pouring process with the following advantages:

- Insulating to ensure that the hottest possible metal reaches the foam runner system
- Elimination of a foam downsprue, thus reducing both the amount of decomposition products created during the pouring process and metal temperature loss resulting from decomposition of the foam sprue
- Rapid build-up of head pressure with an adequate volume of metal to properly "pressurize" the system for controlled foam/metal displacement
- Elimination of inclusions caused by sand erosion in the sprue area

These riser sleeves are available in a variety of compositions to meet your casting needs. Ask about the technical bulletin on "Ceramic Fiber Compositions" for specific application information, or contact your Asbury Wilkinson team member for assistance.

Please contact canadainfo@asbury.com today, for the solutions of tomorrow.

Dip Ladles & Liners



A variety of ceramic fiber dip ladles for use in all metal types. Our insulating CF300W rigidized composition is used for maximum service temperature and strength. These thermally efficient ladles and skimmers offer an economical and effective alternative to metal ladles and skimmers. Their durability enables the foundry to use them over and over again with little or no maintenance. Joy-Mark dip ladles and skimmers feature the following characteristics:

BENEFITS:

- Lightweight for maneuverability and ease of handling
- Highly insulating to reduce heat loss to atmosphere
- Strong and durable to allow multiple reuses
- Non-wetting to molten metal
- No preheating necessary after first use
- No coating necessary
- Economical compared to metal and full ceramic ladle and skimmer alternatives
- Low thermal mass to reduce heat loss from metal to ladle or skimmer

Joy Mark Part No.	(inches)					(pounds)				
	TID	BID	Ins Ht.	Frame	Features	Alum	iron	Steel	Copper	Brass
DL-2	2"	2"	2"	½" Metal Ring	5" Handle	0.5	1.6	1.5	1.3	1.5
DL-2.5	1.75"	1"	3.5"	½" Metal Ring	5" Handle	0.5	1.4	1.3	1.1	1.2
DL-3	3.25"	2"	3.5"	½" Metal Ring	5" Handle	1.5	4.5	4.4	3.9	4
DL-5	5.12"	4"	5"	1" Metal Ring	5.5" Handle	6.4	20.4	19	17	18
DL-6	5.12"	4"	6.5"	1" Metal Ring	5.5" Handle	8.3	26.6	25	23	23.4
DL-6.5	9.5"	3.5"	6"	Metal Bracket	L Bracket	17.0	55	51	44	49
DL-7	9.5"	7"	7"	Metal Bracket	L Bracket	29	93.1	87	78	84

FILTERS - 10 ppi, 15 ppi, 25 ppi

SiC



IC iron filters are ceramic foam filters for nodular, gray, and malleable iron castings. Ceramic foam filters effectively remove nonmetallic inclusions including slag and dross from the molten metal stream when properly placed within the gating system. Aiding in reducing turbulence in the gating system and are designed to withstand the high temperatures required in an iron foundry. Available in many standard sizes, square, rectangular and round. Custom sizes are available upon request. To ensure proper filtration for each iron type. (Available in three pore sizes.)

Alumina Silicate



Ideal for for aluminum foundry applications. Ceramic foam filters effectively remove non-metallic inclusions from the molten metal stream when properly placed within the gating system. Aiding in reducing turbulence in the gating system and are designed to withstand the temperatures required in an aluminum foundry. Available in many standard sizes, square, rectangular and round. Custom sizes are available upon request. To ensure proper filtration for aluminum alloys. (Available in three pore sizes.)

Zirconia Ceramic Foam Filters



A proven cost effective means of improving steel casting quality. The wide range of grades including plain carbon, alloy and stainless steels. Plastic gating prints for standard filter sizes are stock items. In addition, our in-house engineering staff can assist in the design of custom gating systems tailored to the requirements of virtually any application.

These filters are available in a variety of compositions to meet your application needs. For specific application needs, contact your Asbury Wilkinson team member for assistance.

Thermocouples and Equipment



Fast, accurate, and reliable liquid metal temperature readings are indispensable tools for cost-effective temperature control during iron and steel production. As the exclusive distributor of Heraeus Electro-Nite sensors in Ontario and Quebec, we offer a wide choice of thermocouple types, probe lengths, and immersion lances to suit all process applications. Plus, additional non-splash designs for improved operator protection and multi-immersion designs are available for critical applications and use in your foundry.

XT - Thermocouple



Heraeus Electro-Nite's invention of the multiple immersion thermocouple was an important advance in molten metal temperature measurement. Because it produced more readings per thermocouple, the original XT lance sharply reduced the per reading cost in foundry applications. An improved model, the patented XT/2, has extended the market dominance achieved by its predecessor. It quickly became, and remains today, the industry standard for economy, accuracy, and dependability. (Page 14)

IF - Thermocouple



The IF model thermocouple is designed for use in small induction furnace, crucible furnace and ladle applications (generally 500 lbs or less). The IF thermocouple measurement element is 1 1/2" long and responds very quickly. It will give accurate temperature measurements in 2-5 seconds. The IF thermocouple is available in Type S (10%) and Type B (6/30) calibration. The IF thermocouple can be used with a removable protection sleeve that protects the pole hardware from radiant heat. (Page 15)

ML Positherm



Low cost, speed, accuracy, and dependability have made the small diameter ML Positherm by HEN the industry standard. Easy penetration of the molten metal is aided by the small diameter of the lance, and its low mass minimizes heat absorption from the hot junction. (Read more on Page 15)

Samplers



Our range of samplers for steel has been adapted to foundry requirements. Most common is the SaF sampler (sampler for foundries), showing a perfect structure for the analyzing spectrometer. As standard, SaF's diameter is 35 mm, thickness on choice (4, 6, 8, 10 and 12 mm). Especially for the pouring line, the SaF-DO gives extra good filling at low superheats. It comes in 4, 6 and 12mm thicknesses.

Quik Spec 3000 - Spectrometer Sampler For Molten Metal



The QS3000 sampler gives the molten metal producer a cost effective, portable and easy to use device for accurate sampling of molten metal. A superior quality sample is essential for accurate and repeatable analysis of cast iron, ductile iron and blast furnace iron on OES (Optical Emission Spectrometer). Free graphite and contamination in the sample can cause erroneous measurements in carbon, silicon and sulfur. (Read more on Page 16)



Digi-Temp - Temperature Measurement In Molten Metals



The ever increasing demands on measurement technology requires the integration of new electronic hardware, interfaces and on particular software. The DigiTemp-E 4 meets all these requirements fully. Its features are reliable, easy to use & flexible for various applications. The DTE4 Wireless has both wired & wireless upgrade.

BENEFITS:

- Switchable Wired input and Wireless upgrade
- Designed for shop floor use
- QUBE T Compatible with a wireless connection and signal strength indicator
- Case size 10" W X 9" H X 6" deep
- Programmable degrees F or degrees C
- Remote temperature display output
- Signal lights and buzzer on the case
- Measurement accuracy better than 1.8 F (1° C)
- Non reflective 2" or 45mm display
- 400° F to 3,300° F measurement range
- RS232 serial, ethernet, TTY output communications
- Programmable type S, R and B - IPTS 1948 & IPTS 1968
- Visible signal (red, yellow, green and buzzer output)
- Lock and display

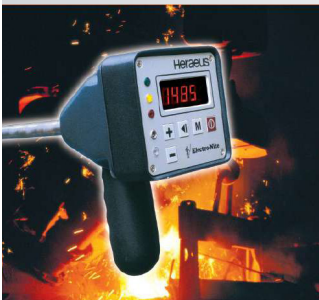


QUBE T

1. Transmitter
2. Handle
3. Battery & charging station



Digi-Lance



The Digilance 4 is designed for temperature measurement of molten metal with immersion thermocouples. It can be used in ferrous and non-ferrous applications and it works with all Asbury offered immersion thermocouples. Upgraded electronics ensure long service life & reliable temperature measurements.

This ergonomically designed light aluminum casting housing, industry proven electronics and reliable battery power system are some of the standard features. This unit includes standard options such as ready (green), measure (yellow) and complete (red) signal lights on the face for ease of operation, 400° F - 3300° F measurement range, & programmable ° F or ° C temperature scale. The unit is available in any combination of Type S or Type B, IPTS 1948 & 1968 calibration standards.

FEATURES OF Model DL4M with memory:

- Stores the last 500 Measurements
- Heat Number can be entered
- Easy wireless IR data download
- Easy to use download software
- Stainless steel pole and contact block

FEATURES OF Model DL4M

- Designed light aluminum casting housing,
- Industry proven electronics
- Reliable battery power system

The DL4M instrument being used to take a reading in an induction furnace



Here is the DL4M easily downloading the data to a PC with wireless infrared technology

Checkmate



The Checkmate IV is a two-channel device that simulates temperatures and QuiK-Cup values. It is used to check the correct functioning of all Heraeus Electro-Nite's temperature measuring instruments. The instrument has a robust aluminum casing with membrane keypad and graphical multi-function display. It is operated with five membrane keys. It has a plug connector for several adapters that allow a direct connection with different measuring instruments and measuring lances.

CAPABILITIES:

For Positherm measurements, seven temperatures can be simulated and the element types S, R, and B can be set. In the QuiK-Cup version, four temperatures and three typical cooling curves type K can be output. To check the measuring cables and the measuring lance, the Checkmate IV measures the insulation resistance along individual wires.

FEATURES/APPLICATIONS

- Comes with Carrying Case Ground
- Easy to use
- Programmable Type B, S, R and K thermocouple output, with IPTS 48 and IPTS 68 calibration tables
- Programmable in degrees F and C
- Oxygen millivolt output or Liquidus Temp for Temp / Carbon systems
- Flexible set-up for thermal analysis output
- Portable for use on the shop floor
- Thermal analysis cooling curve simulation
- Versatility with Cables to adapt to any needed interface; pole, stand, instrument, etc.
- Powered by stable 4 x 1.5 V AA batteries
- Operating ambient temperature range: 32°F- 104°F (0°C- 40°C)

Accuracy

Temperature	$\pm 0.05\% \pm 2.0^\circ\text{F}$
Thermal Analysis	$\pm 0.05\% \pm 2.0^\circ\text{F}$
emf	$\pm 0.05\% \pm 0.3\text{mV}$

SLFK Sensor Lab

Sensor Lab Foundry offers a complete thermal analysis solution. The system utilizes cooling curves from special crucibles (QuiK-Cup® disposable measurement test cups) to calculate chemical composition (carbon equivalent, carbon and silicon) or to evaluate undercooling of cast iron melts. Measurements can be taken from two separate stations simultaneously. This precise and versatile measuring instrument has a wide range of features:

FEATURES

- An advanced measuring algorithm
- Live visualization of the cooling curve
- Result calculation configurable by material type
- Multiple communication output protocols
- Process range indication
- Direct access to result trending
- Local storage of up to 3000 measurements
- Ability to add custom equations
- Wireless measurements capability
- Remote client access
- Easy USB data export
- Compatible with the MeltControl 2020 measurement data system for foundries



BENEFITS:

- Two independent QuiK-Cup® measurement stations (wired and/or wireless)
- Automatic detection of standard Te and non-Te QuiK-Cup®
- Small size and light weight desktop style enclosure allowing easy installation
- Intuitive setup and operation
- Ranges and equations for different cast iron materials

Please contact canadainfo@asbury.com today, for the solutions of tomorrow.

QuiK-Cup® QCTE



The QuiK-Cup has foregone a long awaited upgrade in the Thermal Analysis Sector. The New QCTE is the evolution of all our learned knowledge in Making Thermal Analysis Cups for Iron applying lessons learned in square cup and round cup strategies.

The result is a round solidification chamber with a square cup exterior and connection system. Our decades of engineering have yielded a super connection with an accelerated solidification with improved accuracy.

Improved Packaging : 50/Tray, 100 per Box , 3000 per Pallet 36#s per box 1100 lbs. /Pallet

Design Improvements:

Heraeus Electro-Nite has undertaken a re-design project to improve the QuiK-Cup- and TECT1 : iron thermal analysis cups. During 2013 the cup was re-designed and testing was completed. A new assembly machine was built in the Hartland WI plant.

We are now ready to begin conversion of existing cup customers. The new design will initially replace current model QK200 and TT200. It will eventually replace all cup models, the non-tellurium 1QK 100, TT100 and the MgCup TT335 will come later in 2015.

A contact block change is necessary for customers changing from the round TECTIIP cups. Measurements, with the new design are the same as with the current model. However they are 20% faster.



**Figure 1:
QK200 in use**

New Design Features:

The new design incorporates a round solidification chamber with the traditional square contact block plug-in (Figure 2 & 3). The primary goal of the re-design was to improve accuracy and overall reliability.

- Accuracy of silicon and carbon prediction improves 10 %
- Enhanced welding method improves thermocouple strength 30%
- Cement mixture increases shelf life from 1 year to 3 years
- Stronger core sand improves cup engagement on the stand.
- 15% reduction in fume generation when iron is poured
- More obvious plug-in orientation identification
- 20% faster measurements
- Packaging remains the same - 100/box and 3000/pallet

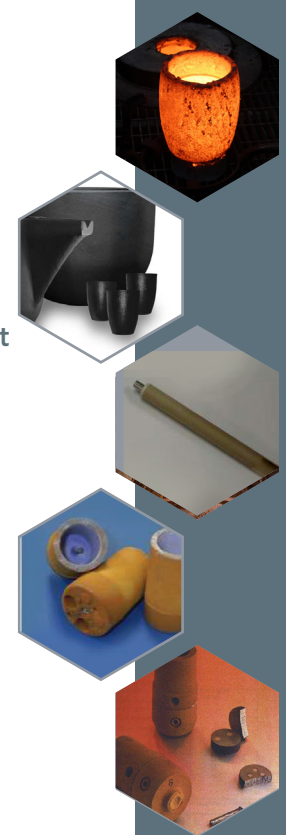
**Figure 2:
QK200 - QuikCup**



**Figure 3:
QK200 - QuikCup**



**Figure 4:
TT200 - TECTIP**



XT® MULTI-USE THERMOCOUPLES



IMMERSION THERMOCOUPLES FOR FOUNDRY APPLICATIONS

XT® Thermocouple: Heraeus Electro-Nite's invention of the multiple immersion thermocouple was an important advance in molten metal temperature measurement. Because it produced more readings per thermocouple, the original XT lance sharply reduced the per reading cost in foundry applications. An improved model, the patented XT/2, has extended the market dominance achieved by its predecessor. It quickly became, and remains today, the industry standard for economy, accuracy, and dependability.

XT/2:

In foundry applications such as induction furnaces, fuel-fired crucible furnaces, cupola fore hearths, ladles—anywhere, in fact, where heavy slag cover is absent—the XT/2 lance gives the foundryman an unbeatable combination of advantages.

A patented design, the XT/2 thermocouple has a quartz U-bend embedded in a special insulating refractory cement. A refractory fiber sheath prevents splashing when the lance is immersed.

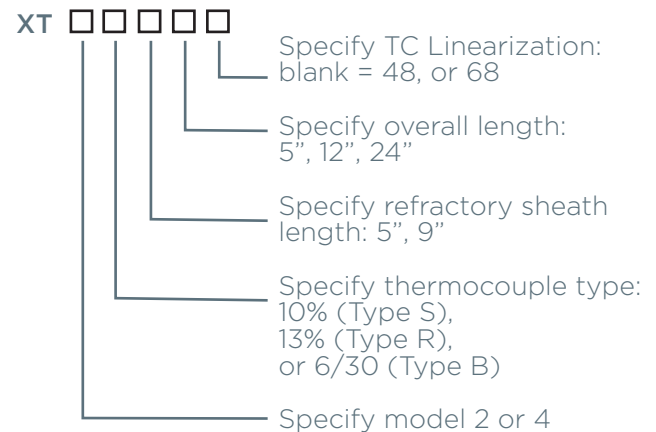
The sheath is precisely engineered to help extend the XT/2's useful life, protecting the contacts and minimizing cold junction heating even after repeated immersions. The internal shape of the sheath creates a positive stop and seal when the sheath is fitted to the cardboard tube, adding an effective thermal barrier at the top of the thermocouple insert. A wrapping of aluminum foil protects the paper tube.

These exclusive design features, coupled with strict quality standards of its components and production, give the XT/2 lance a high degree of dependability, accuracy and consistently longer operating life. Superiority of the XT/2 design is demonstrated when the lance is used for quickly repeated measurements. Because of the minimized internal heat build-up, the XT/2 delivers accurate readings over a rapid series of three or four immersions.

XT/4 Model for Special Applications:

A premium model, the XT/4 lance, is recommended for use in stainless steel, corrosive iron alloys, unusually high tapping temperatures, and other special applications.

ORDERING APPLICATION:



When ordering, specify the model: the standard XT/2 or the premium XT/4 and the thermocouple type (S, R or B). Also specify one of the four combinations of refractory sheath length to overall lance length as follows:

Refractory Length	Overall Length
5	5
5	5
9	9
9	9

Example: XT21055
Packaging: 50 piece per box

IF THERMOCOUPLES



The IF model thermocouple is designed for use in small induction furnace, crucible furnace and ladle applications (generally 500 lbs or less). The IF thermocouple measurement element is 1 ½" long and responds very quickly. It will give accurate temperature measurements in 2-5 seconds. The IF thermocouple is available in Type S (10%) and Type B (6/30) calibration. The IF thermocouple can be used with a removable protection sleeve that protects the pole hardware from radiant heat.



The IF thermocouple can be used in both ferrous and non ferrous metal with Instruments such as the DL4, DL4M and DTE3 as well as other instrumentation. Typically, the IF thermocouple will last for 4-8 measurements depending on the type of metal and the amount of slag. The IF model is also available with a hard ceramic protection sleeve, this model, the NSLIF, is used in vacuum melting applications where metal contamination is a concern.

The IF thermocouple has a 1 ½ inch long thermocouple loop cemented into a ceramic body. The quick disconnect connector allows for connection to a measurement pole.

The NSLIF model has a hard ceramic protection sleeve available in 6" or 12" in lengths

Shown on the right, is the IF thermocouple attached to a measurement pole, taking a temperature in a crucible furnace



ML Positherm - Single Immersion Small Diameter Lance

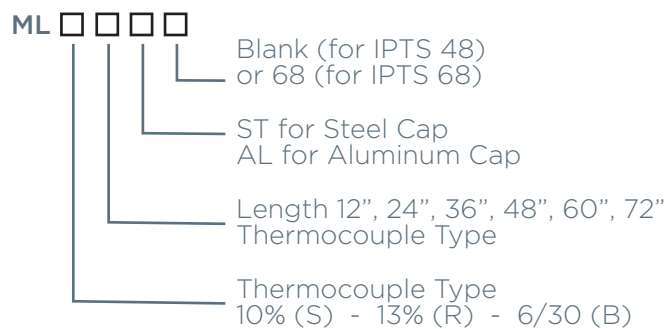


EXCLUSIVE FEATURES MAKE POSITHERM AN INDUSTRY STANDARD

Low cost, speed, accuracy, and dependability have made the small diameter ML Positherm by HEN the industry standard.

Easy penetration of the molten metal is aided by the small diameter of the lance, and its low mass minimizes heat absorption from the hot junction. The quartz loop is mounted with a specially formulated cement that resists moisture pick up and damage in storage. All three of these single use lances (EN3, ML Positherm, and ENtherm) are made with a monolithic ceramic body that has proved much more reliable than other designs utilizing plastic bodies and large exposed surfaces of unfired castable cement.

ORDERING APPLICATION:

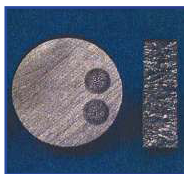


QuiK-Spec® 3000**SPECTROMETER SAMPLER FOR MOLTEN METAL**

The QS3000 sampler gives the molten metal producer a cost effective, portable and easy to use device for accurate sampling of molten metal.

IRON ANALYSIS

A superior quality sample is essential for accurate and repeatable analysis of cast iron, ductile iron and blast furnace iron on OES (Optical Emission Spectrometer). Free graphite and contamination in the sample can cause erroneous measurements in carbon, silicon and sulfur. The QS3000 sampler provides the lab with a sample that is superior in sample reproducibility than commercially available standards. This unique device eliminates the need for spoon sampling. The QS3000 sampler offers a consistent disc and pin that is easy to run in the lab.



< Polished Sample

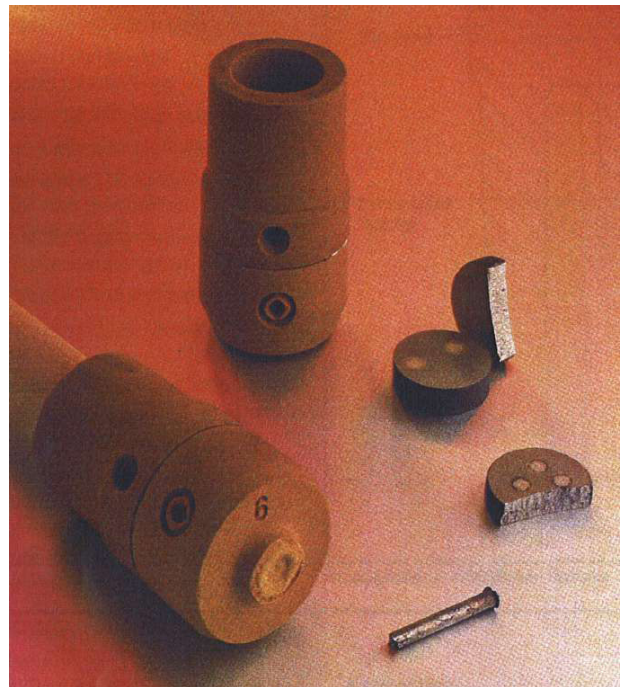
QS3000 Iron Sampler Series with Reusable Cardboard Tube.>

STEEL ANALYSIS

The QS3000 sampler is ideal for molten steel. Aluminum or zirconium deoxidation can be added for high oxygen applications. Consistent surface quality reduces preparation time and yields accurate OES analysis. The sampler can be used in the furnace or ladle.

NONFERROUS ANALYSIS

In nonferrous applications the QS3000 is convenient to use and yields a sample which is homogeneous and easy to prepare. The QS3000 sampler allows sampling of the metal at any processing step.



Please contact canadainfo@asbury.com today, for the solutions of tomorrow.

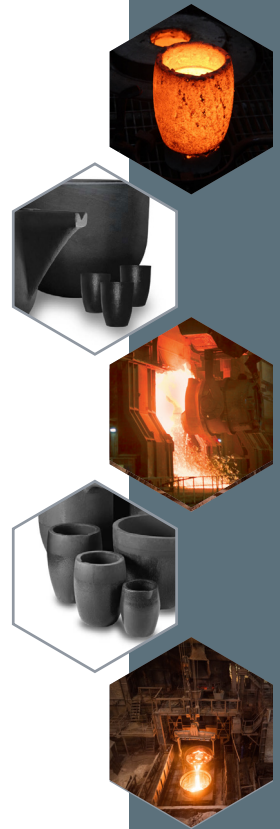
Three Types of Crucibles...

Offering top quality products from premium suppliers, Asbury's one-stop-shop for foundry products makes it easy to bundle everything you need for fast, reliable delivery and reduced shipping costs.

Our high-quality metal carbon and non-carbon crucibles for electric resistance, induction and gas-fired furnace offer maximum alloy flexibility and low-metal cost, reducing your downtime, as well as maintenance and capital costs.

Supplied by Asbury Wilkinson, Ontario, Canada:

- Alumina/chrome/magnesia
- Clay graphite
- Silicon carbide
- Pure graphite



Silicon Carbide - Starrbide



Starrbide is high chemical resistance over large temperature range. Starrbide crucibles are carbon-bonded silicon carbide crucibles, which are characterised by excellent thermal conductivity and high chemical erosion resistance. Due to their carbon content, SiC crucibles have excellent stability at high temperatures and are therefore particularly suitable for processes where the temperature is changing frequently and where high heating rates are utilized.

METAL CASTING TEMP:

Starrbide HT / VO: 800°C - 1400°C (1472°F - 2552°F)
Starrbide U / U IND: 700°C - 1000°C (1292°F - 1832°F)

APPLICATIONS

- Syncarb UL & ISO SiC R offers superior performance for aggressive erosive conditions with heavy flux usage in both copper based alloys and precious metal reclamation. The product is designed for use in gas, oil and low to medium frequency induction furnaces.
- Starrbide HT / VO crucibles are particularly appropriate for melting copper and bronze alloys in furnaces with high power and high heating rates.
- Starrbide U IND crucibles are suitable for medium frequency induction furnaces for melting and holding. They perform well under difficult operating conditions.

BENEFITS:

- Outstanding thermal shock resistance
- Very good thermal conductivity
- Good resistance to chemical erosion
- Good thermal shock resistance
- High mechanical strength
- High oxidation resistance

Silicon Carbide - Syncarb



Syncarb is high erosion resistance over large temperature range. Syncarb UL & ISO SiC R is a premium quality carbon bonded silicon carbide crucible manufactured by high pressure iso-static pressing. Providing a superior grade product for the most arduous service conditions. ISO SiC R is a modified version, which offers a better resistance against heavy flux usage.

METAL CASTING TEMP:

between 1000°C and 1400°C (1832°F and 2552°F)

APPLICATIONS

• Syncarb UL & ISO SiC R offers superior performance for aggressive erosive conditions with heavy flux usage in both copper based alloys and precious metal reclamation. The product is designed for use in gas, oil and low to medium frequency induction furnaces.

BENEFITS:

- Superior erosion resistance
- High resistance to chemical erosion
- Excellent thermal shock resistance
- High mechanical strength
- High consistent density
- Fast melting speed

SIZES:

Available in a range of shapes and sizes to suit most end user requirements. Sizes can be made available with pyrometer pocket to facilitate measurement. Heavy wall (HW) versions can be supplied and a wide range of pouring lips and spouts is available.



Clay Graphite Crucibles



Clay Graphite is easy to use in multiple applications & excellent chemical resistance. Graphite crucibles are rib formed clay-graphite crucibles characterised by high refractoriness and good thermal conductivity as well as very good thermal shock resistance and chemical resistance against fluxes. In order to meet the specific requirements of induction furnaces, Morgan Molten Metal Systems has developed a specialised range of clay-graphite crucibles with a specific modified electrical resistivity. This optimises the coupling power of the crucible and avoids the risk of overheating.

clay-graphite crucibles with a specific modified electrical resistivity. This optimises the coupling power of the crucible and avoids the risk of overheating.

METAL CASTING TEMP:

between 1000°C and 1400°C (1832°F and 2552°F)

APPLICATIONS

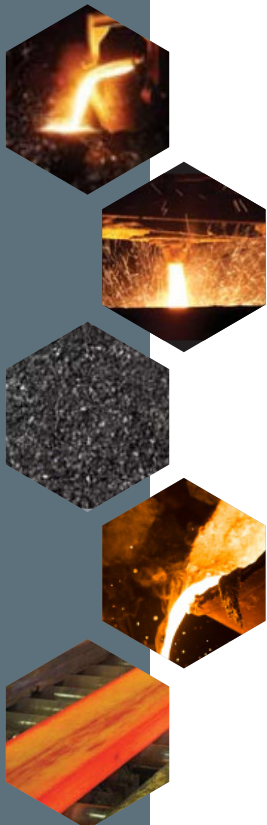
• Graphite crucibles are suitable for all furnace systems for non-ferrous metal alloys, cast iron and precious metals.

BENEFITS:

- High refractoriness
- Good thermal conductivity
- Good resistance to chemical erosion
- Good thermal shock resistance
- High mechanical strength
- Good oxidation resistance

SIZES:

• Graphite crucibles are available in a range of shapes and sizes to suit most end user requirements. Sizes can be made available with pyrometer holes to facilitate measurement of metal temperature. A wide range of pouring lips and spouts is available.



Shapes: Isotropic Graphite for High Strength Applications



Asbury, through its network of business partners, is able to provide Fine, Super Fine and Ultra Fine grain graphite for those EDM applications that require both high strength and great finish. We can provide the finished product or the blanks to meet your needs.



Types

Type	Grade	Applications
Fine Grain	IPG IPG14	Economical solution with excellent mechanical properties
Super Fine Grain	IPG15 IPG16	High strength electrodes, large featured molds, structural ribs
Ultra Fine Grain	IPG19 IPG24	Highest mechanical properties for applications including and not limited to; large injection molds, Punch & Die sets, die casting, medical prosthetics, plastic injection molds, forging dies, aerospace metal cutting, and fine detail electrodes.

Isotropic Graphite Shape Properties List

Property	Units	IPG	IPG14	IPG15	IPG16	IPG19	IPG24
Density	g/cm ³	1.82	1.76	1.78	1.8	1.78	1.86
Grain Size (Avg.)	mm	0.025	0.012	0.008	0.012	0.004	0.005
Electrical Resistivity	μ ohm m	10	13	13	12	14	13
	μ ohm in	390	510	530	490	550	500
Compressive Strength	Mpa	79	99	106	114	135	167
	PSI	11,500	14,300	15,400	16,500	19,600	24,200
Flexural Strength	Mpa	40	45	52	52	73	76
	PSI	5,800	6,500	7,540	7,500	10,600	11,000
Tensile Strength	Mpa	26	29	34	34	48	49
	PSI	3,740	4,225	4,900	4,875	6,890	7,150
Young's Modulus	GPa	9.7	9.7	10.1	10.6	10.9	12.9
	10 ⁶ PSI	1.4	1.4	1.5	1.5	1.6	1.9
Thermal Conductivity	w/mK	116	208	157	104	157	102
	Btu-ft./hr ft ² °F	67	120	90	60	90	59
Hardness	Shore	48	55	63	65	72	80
CTE (to 100 °C)	10 ⁻⁶ /°C	3.0	4.6	5.6	5.4	5.0	5.9
	10 ⁻⁶ / °F	1.7	2.64	3.1	3.0	2.8	3.3
Porosity Ash	%	12	16	8	10	-	7
	%	0.08	0.05	0.05	0.05	-	0.025

*The properties listed below are based on nominal data and are not meant to be a guarantee.

Shapes: Graphite Trays, Lube Blocks, Rods, And Machined Parts



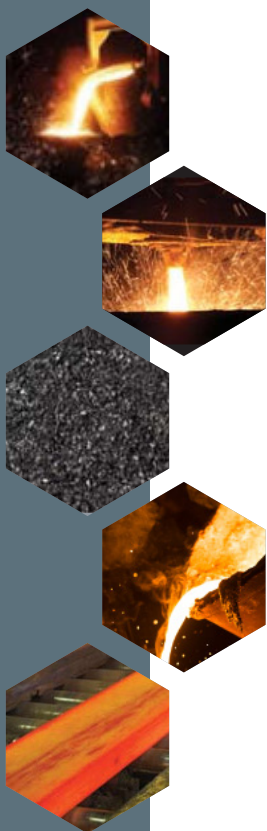
Supplying graphite and carbon products since 1895, Asbury provides industry with graphite plates, rods, pipe and machined parts. Asbury is happy to assist in choosing the correct graphite or carbon product to meet your specifications.



Types of Shapes

Grade	Descriptons
750	Economical graphite grade used for lubricating blocks, sintering trays, run-out tables, silver molds and foundry wear plates.
745	Economical Carbon Mini Rods used as spacers and mixing.
765	Graphite Mini Rod used for mixing, spacers and casting
800	Durable mid grade used for lubrication, sintering trays, nozzles and other machined shapes.
850	Our highest grade of extruded graphite used for furnace liners, effluent pipe, various types of sleeves, rollers, rings and other machined shapes when higher strength is required
IPG	Isostatic fine grain graphite where high strength is needed. This includes furnace liners, bearings, and other machined application

See next page for additional information)



Shape Properties List

Property	Units	750	800	850	IPG
Density	g/cm ³	1.63-1.68	1.61-1.72	1.72-1.75	1.72-1.82
Grain Size (Avg.)	mm	1.5-6.3	0.8-1.8	0.08	0.015-0.025
Electrical Resistivity	μ ohm m	4.3-8	8.4-8.5	7-8	10-15
	μ ohm in	170-315	330-355	275-315	390-590
Compressive Strength	Mpa	17.6-26.9	28.2-32.1	34.9-41.4	79.3-91
	PSI	2560-3900	4100-4650	5070-6000	11500-13200
Flexural Strength	Mpa	9.8-13.1	13.4-14.9	14.5-25	40-44.8
	PSI	1420-1900	1950-2160	2100-3625	5800-6500
Tensile Strength	Mpa	8.3-13.8	10.3-15.0	10.3-15	25.5-26.9
	PSI	1200-2000	1500-2175	1500-2175	3700-3900
Young's Modulus	GPa	7.6-12	8.9-13	10.7-12.8	6.9-10.3
	10 ⁶ PSI	1.1-1.7	1.30-1.88	1.55-1.85	1.0-1.5
Thermal Conductivity	w/mK	145-157	145-154	152-200	90-116
	Btu-ft./hr ft ² °F	84-90	84-89	88-116	52-67
CTE (to 100 °C)	10 ⁻⁶ /°C	1.4-3.2	2.3-2.7	2.3-4.5	3.0-5.2
	10 ⁻⁶ /°F	0.8-1.8	1.3-1.5	1.3-2.5	1.7-2.9
Porosity Ash	%	22-26	18-28	16-23	12
	%	0.2	0.15-0.15	0.09-0.15	0.05-0.08

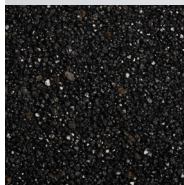
*The properties listed below are based on nominal data and are not meant to be a guarantee.



Shape Properties List

Property	Units	Carbon 745	Graphite 765
Density	g/cm ³	1.68	1.70-1.76
Grain Size (Avg.)	mm	0.2	0.2
Electrical Resistivity	μ ohm m	1.8-2.3	9.6-12.7
	μ ohm in	70.9-90.6	340-500
Flexural Strength	Mpa / PSI	31 / 4500	24.1 / 3500
Ash	%	0.06	0.1

Chromite



Specially selected chromite sand provides an elevated point of sintering and high thermal conductivity ideal in the preparation of molds and hot spot castings. Unlike badly washed or low-purity chromite sands that can lead to poor hardening in resin molds and notable defects, our LCM chromite sand is subjected to strict checks on site and before shipment. Plus, a detailed analysis report is provided with each order to guarantee we're meeting your exact requirements.

Zircon Sand, Flour



Used widely in steel foundries with particularly high smelting temperatures, as well as in refractory and ceramic production, zircon is a highly refractory sand made with 99% zirconium silicate. This sand is generally used as a skeleton for special mixtures, used where the steel cast is subjected to liquid metal thermal stress and can find use as an organic and inorganic

Silica (Sand)

A high-purity quartz (SiO₂) sand deposited by natural processes is used as glass sand, foundry sand, abrasives, fillers, and hydraulic fracturing (frac) sand. Asbury offers high-quality silica sand to reduce the chance of impurities, withstanding high temperatures, mold shaping, release of gases, and support the metal weight, yet be of a fine enough texture to result in a smooth casting.

Carbon Sand



This silica-free and unique form of spherical carbon is an excellent alternative to costly specialty sands for challenging applications. With no melting point, carbon sand will not sublime or fuse at any temperature. It helps eliminate veining and scabbing, promotes reducing atmosphere in the mold and is excellent for casting large flat sections of iron with ½ inch or greater thickness. Non-abrasive, it offers good heat transfer and is reused in certain metallurgical systems.



THE MANUFACTURER AND SUPPLIER OF CHOICE

When it comes to friction products, Asbury Carbons gives you all the advantages:

- We offer the largest selection of high-quality products.
- We ship from conveniently located plants in the U.S. and from warehouses in Europe and Asia.
- To help keep freight costs low, we engage a worldwide network of distributors.
- Overseas shipments are available from East and Gulf coast ports.
- Packaging choices include bags, bulk sacks, and bulk trucks and barges.
- And of course, Asbury Carbons offers custom processing and packaging.

Asbury Carbons sets industry standards in the areas that matter most to our customers.

- Quality** — All Asbury Carbons products are made to strict specifications. Each of our manufacturing operations has its own quality control labs to constantly monitor our products for the friction industry.
- Variety** — Asbury Carbons is the only supplier offering every type of product currently available for the friction industry. We continually develop new product breakthroughs that make other industry mainstays obsolete.
- Reliability** — Asbury Carbons is a well-established graphite and carbon company with proven excellence since 1895. Each shipment can be furnished with a no-charge “Report of Analysis” certifying standard specifications and specially requested information.
- Availability** — Manufacturing plants and major warehouses in the U.S. and Canada, providing quick delivery and keeping freight costs low.



SPECIALTY MATERIALS - FRICTION PRODUCTS

Asbury offers lubricants such as calcium fluoride, in addition to friction modifiers and specialty materials like: iron copper sulfide, zinc sulfide, gilsonite and proprietary products such as Sicacell and Ultimate. We will provide or process any material to meet your friction challenges.

Lubricants

Ultimate Product Series
 Calcium Flouride
 Iron Coppoer Sulfide
 Zinc Sulfide

Processing Aids/ Modifiers / Stabalizers

Sicacell
 Gilsonite - HMA modifier
 Rubber NBR1

Our products include all natural and synthetic graphites, Graphco, metallurgical cokes, petroleum cokes, and specialty carbons such as carbon fibers, activated carbon and carbon black. You can count on Asbury graphite products to provide good lubrication at high temperatures. Graphite’s ability to help lay down a transfer layer helps stabilize friction over a wide range of temperatures. Graphite’s good thermal stability helps to eliminate “hot spots.”

Benefits of Graphite

Benefits of Carbon

Moderate Friction
 Solid Lubricant
 Aid in transfer layer
 Thermal Stability
 Noise Reduction
 Low reactivity with other constituents

Stabilized Friction
 High Thermal Properties
 Increases life of the friction material
 Will not harm the mating surface
 Helps reduce noise by increasing the internal porosity of the friction material

Please contact canadainfo@asbury.com today, for the solutions of tomorrow.

FRICTION - CARBONS and GRAPHITE PRODUCTS

Graphites		
Amorphous	Size	C (min)
505	85% - 325	80
1155 Special	20 x 100	84
Natural Flake		
3609	-100 mesh	95
3562	+50 mesh	96
3160	-100 mesh	99
3061	+50 mesh	99
Vein		
2040	20 x 80	90
Synthetic		
4052	20 x 40	99
4071	20 x 100	99
4235	20 x 100	99
4110	80 x 200	99
4390	100 x 0	99
A625	90% - 325	99
Specialty Synthetic		
4800	30 x 80	99
Purified Synthetic		
4443	20 x 100	99.8
4421	90% - 325	99.5
Graphco		
4955	20 x 100	98
4956	100 x 325	98
4957	90% - 325	98

Cokes		
Calcined Sponge	Size	C (min)
4079	20 x 100	99
4249	95% - 200	99
Specialty Cokes		
4335	20 x 200	99
4339	20 x 200	94
262	20 x 200	98
Metallurgical Cokes		
4072C	80% - 325	88
Specialty Carbons		
Activated Carbons	Size	C (min)
5562	90% - 200	90
5602	90% - 325	90
Hard Carbon Cokes		
30 x 200	30 x 200	88
-200	90% x 200	88
Coal Products		
SeaCoal - C3/B2	20 x 325	50
ACFM-2	20 x 100	83
Carbon Fibers (0.25". 0.125, milled)		
AGM 62/ 96/ 99	Pan Based	
AGM 95	Pan Based	
CarboBeads		
Fine	60 x 200	99
Medium	40 x 200	99
Coarse	10 x 200	99

Boron Nitride

Medium and high agglomerated hexagonal boron nitride available upon request.

Other products



- CAF2 - Calcium Fluoride
- Iron Oxide
- Hot Topping
- Charcoal
- Sulfur Pellets
- Iron Pyrite
- Bentonite
- Gilsonite
- Corn Flour
- 4106 Diamond Parting
- Marcote 5
- Vermiculite
- Perlite - Slag Coagulant
- Lime
- Hard Coal
- Carbon Black
- Carbon Fiber
- Coal

Please contact canadainfo@asbury.com today, for the solutions of tomorrow.



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