

Activated Carbon

CAS 7440-44-0 · C · Coconut shell & coal; GAC / PAC / pellets

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1. Product identity

Product name	Activated Carbon
Synonyms	activated charcoal, GAC, PAC, granular activated carbon, powdered activated carbon
C.A.S. number	7440-44-0 is the number carried on virtually every commercial invoice and safety data sheet, and is the identifier the EU REACH registrations were built on - but it is strictly the CAS number for elemental carbon. 64365-11-3 is the CAS entry that actually denotes activated charcoal; 16291-96-6 denotes non-activated charcoal. Activated carbon is a UVCB - a substance of unknown or variable composition - so no single CAS number is chemically correct for it. The EU splits it into two registered substances by activation route: Activated Carbon High Density Skeleton (EC 931-328-0, steam or physically activated) and Activated Carbon Low Density Skeleton (chemically activated, e.g. with phosphoric acid). A sheet quoting the HDS registration for a chemically activated product is wrong
Molecular formula	C (nominal only)
Molecular weight	Not applicable - activated carbon is not a discrete molecular compound. It is up to about 90% carbon with oxygen, hydrogen, sulphur and nitrogen present as atoms or in surface functional groups (carboxyl, carbonyl, phenol, lactone, ether, quinone), the mix depending on feedstock and activation agent. A molar mass of 12.011 g/mol is the atomic mass of carbon and does not describe the product
Grade supplied against	Coconut shell & coal; GAC / PAC / pellets
Appearance	Black granules, powder, extruded pellets, fibres or felts. Generally odourless; a slight sulphurous smell when wet is reported by some producers
Product group	Water & Effluent Treatment
HSN code	3802 10 00
Country of origin	As stated on the producer's documents for the lot supplied; confirmed at offer stage
Packing	25 kg bag

Storage

Cool, dry, well ventilated, in closed containers, in the original packaging, away from heat, hot surfaces, sparks, open flame, direct sunlight and all ignition sources; no smoking. Separated from oxidisers and from flammable chemical storage. Keep the material dry - wetting is exothermic and makes self-heating worse, and absorbed moisture also shows up as high moisture content on test. THE CONFINED-SPACE HAZARD IS THE ONE THAT KILLS AND IT IS ON EVERY MAJOR PRODUCER'S SHEET: activated carbon, especially when wet, ADSORBS OXYGEN FROM THE AIR and can create an oxygen-deficient atmosphere in an enclosed space. Before anyone enters a vessel, tank, silo, hopper, filter housing or container that contains or has previously contained activated carbon, the atmosphere must be tested for oxygen and for carbon monoxide, and the space worked as a confined space with self-contained breathing apparatus, a standby person and a rescue plan. Do not rely on the space looking empty. In fire, do not use solid water jets - high-pressure media can raise an explosive dust cloud; use water fog or spray, and expect the material to smoulder deep in the bed long after the surface looks out. No publicly documented fatality attributed specifically to activated-carbon oxygen depletion was located when this record was compiled, so the hazard is stated here on the authority of the producers' own sheets rather than on an incident record.

2. Analytical specification

S. No.	Test parameter	Specification	Method
1	Description	Black granules, powder, extruded pellets, fibres or felts. Generally odourless; a slight sulphurous smell when wet is reported by some producers	Visual
2	Identification	Conforms to the substance supplied	Instrumental or chemical test, per method agreed
3	Assay / grade	Coconut shell & coal; GAC / PAC / pellets	Titrimetry or instrumental, per method agreed
4	Physical state	Solid, porous. Particle size across the range of traded forms spans roughly 1 micrometre to 10 mm	Visual
5	Solubility in water	Insoluble	Per the test method agreed
6	pH	Grade-dependent; there is no single figure. Producer sheets for coconut-shell grades quote a pH range of 1–11 across their product families and others quote 7–10; several decline to give a figure at all. IS 2752:1995 sets NO pH requirement for granular activated carbon — its Table 1 covers carbon tetrachloride adsorption, moisture, ash, hardness number, retentivity index, iodine number, half dechlorination value and surface area, and nothing else. IS 8366:1989 sets pH only for Type 3, pharmaceutical decolourising, at 6.5–7.5. IS 877:1989 clause 9 gives the Indian test method; ASTM D3838 is the international one. Take the figure for the grade from the lot certificate rather than from a generic sheet.	Potentiometry on an aqueous suspension

S. No.	Test parameter	Specification	Method
7	Relative density	Three different densities exist for this product and they differ by nearly a factor of ten, so a sheet printing a single density figure is not usable. Bulk (apparent) density, which includes inter-particle voids and is what determines how many kilograms fill a vessel: approximately 0.25-0.64 g/cm ³ across traded grades (ASTM D2854). Particle density, including the granule's own pores but not the voids between granules: approximately 0.82 g/cm ³ for steam-activated coconut shell. True or skeletal (helium) density of the carbon framework itself: 2.31 g/cm ³ at 20 C. Specify which one your vessel loading calculation uses	Pyknometry or gas displacement
8	Melting / freezing point	Not applicable (producer sheets state Not applicable). Carbon's sublimation temperature of roughly 3,600 C is not a property of the traded product and should not be quoted on a safety data sheet	Thermal analysis
9	Boiling point	Not applicable	Distillation range
10	Flash point	Not applicable - activated carbon has no flash point and is not a flammable liquid. It is nevertheless a COMBUSTIBLE SOLID that smoulders rather than flames, and the dust can form an explosive mixture with air. Ignition temperature is approximately 350 C by ASTM D3466 for steam-activated coconut shell, with other producers quoting above 220 C; one major producer records no data. Quote a range and name the method; do not state a single autoignition figure. Combustion products are carbon monoxide and carbon dioxide	Closed cup
11	Additional parameters	To the specification agreed before order	As agreed

3. Transport classification

UN 1362 where the material is classified; the specific entry is CARBON, ACTIVATED. Do not confuse it with UN 1361, CARBON, animal or vegetable origin, which is the NON-activated material and expressly includes charcoal made from coconut shell, bone, bamboo, jute and wood - that is the FEEDSTOCK for activated carbon, not the product, and since 2026 its shipping regime is markedly more onerous. Much traded activated carbon moves exempt and is not dangerous goods at all: see the class and packing-group fields and the notes · Class Class 4.2 - substances liable to spontaneous combustion / self-heating - where the material is classified. ADR classification code S2, Kemler danger number 40, tunnel restriction code (E), transport category 4, packing instructions P002/IBC08/LP02/R001, limited quantity 0; US 49 CFR ERG guide 133, special provision W31 requiring non-bulk packagings to be hermetically sealed, passenger and cargo aircraft limit 0.5 kg, vessel stowage category A. The exemption is the normal commercial position for steam-activated material but it is CONDITIONAL and the conditions changed on 1 January 2026 - see notes · Packing group III where classified. The UN self-heating test N.4 (UN Manual of Tests and Criteria section 33.4.6, formerly 33.3.1.6) is what decides classification: cubic wire-mesh baskets of 25 mm and 100 mm side are held in an oven, and a positive result is spontaneous ignition or a temperature rise of 60 C or more above oven temperature. Positive in the 25 mm cube at 140 C gives packing group II; positive in the 100 mm cube at 140 C with the 25 mm cube negative gives packing group III, subject to package-volume conditions; negative in the 100 mm cube at 140 C means the material is not Division 4.2 at all. US PHMSA accepted on N.4 data (letter of interpretation 23-0058) that specific steam-activated and chemically activated products do not meet the Division 4.2 definition, and reminded shippers that classification is the shipper's own responsibility. The package-volume sub-criteria were transcribed from secondary sources because the UN Model Regulations text was unreachable, and should be checked against the Regulations before being relied on

Proper shipping name: CARBON, ACTIVATED - but only where the material is classified. Most steam-activated carbon moves as ordinary non-dangerous cargo under the exemption, in which case there is no proper shipping name and the consignment is not described as dangerous goods at all. Which of the two applies to a given lot depends on the activation route and, for chemically activated grades, on a UN Test N.4 result - see the packing group field and the notes. Do not pre-print either description on a transport document without settling the lot's position first

What this document is. This is a product specification sheet. It states the grade this material is supplied against, its packing and its identity. **It is not a certificate of analysis, it carries no test results, and it certifies no batch.** Tested values for the consignment actually loaded appear on the batch certificate of analysis issued against that batch, which travels with the despatch documents. Identity and physical data are drawn from PubChem, the ECHA CLP inventory and ILO safety cards; the producer's documents for the grade quoted govern. Velora Chemicals Private Limited is a bulk supplier and trader, not a manufacturer.