

## WSC-370 & WSC-470 Coconut based Extruded activated Carbon

### DESCRIPTION

**WSC-370** and **WSC-470** are 3 and 4 mm pelleted activated carbons from the WS range. It is produced by high temperature steam activation of selected grades of coconut shell char under rigorously controlled conditions. This process results in a pore structure which gives excellent adsorption and desorption properties for a wide range of organic compounds. In addition, the coconut shell based raw material has very low impurities making it suited to catalyst and catalyst support applications.

This process involves adsorption of solvents on the carbon until exhaustion. The adsorber is then regenerated in-situ allowing recovery of the adsorbed solvents for recycling. The system normally consists of two or more adsorbers operating in either duty or regeneration allowing continuous operation. Most systems are regenerated using steam, but hot nitrogen gas and pressure swing are also used in some cases. Recovery of solvents saves costs and minimises the impact on the environment.

### FEATURES

**WSC-370** and **WSC-470** coconut based extruded activated carbons have several properties which explain their performance in a wide range of applications:

- High working capacity to allow the adsorber size and therefore capital cost to be minimised.
- Low outlet concentrations obtainable ensuring the strictest emission requirements can be met.
- Low steam to solvent ratio to minimise energy costs for steam consumption, easier product recovery and reduced waste water.
- High purity to prevent decomposition of solvents such as acetone.
- Prevent side reactions when used as a catalyst or poisoning of the catalyst.
- High hardness to ensure excellent resistance to mechanical and thermal stress.
- Low pressure drop reducing fan size and energy consumption.
- The high purity minimises any undesirable side reactions resulting in an ideal catalyst support.

### SELECTION

**WSC-470** should be selected as standard. A 4mm pellet normally has the best balance of performance with low pressure drop. **WSC-370** should be selected where extra low emission concentrations are required or in small devices such as cartridge filters. Typical solvent recovery applications include:

- Ketones such as acetone and Methyl Ethyl Ketone (MEK)
- Alcohols such as ethanol.
- Methylene chloride

### PROPERTIES

SPECIFICATIONS	WSC-370 3mm	WSC-470 4mm
Carbon tetrachloride activity, %w/w	70	70
Butane activity, min., %w/w	27	27
Hardness number, min.	95	95
Moisture content, as packed, max., %w/w	5	5
Mesh size, US sieve series, %w/w		
> 6 Mesh (3.35mm), min.	-	95
> 8 Mesh (2.36mm), min.	95	-

*(Please refer to the Sales Specification Sheets, which state the Chemviron Carbon test method used to define the above specifications. Copies are available upon request.)*

TYPICAL PROPERTIES	WSC-370 3mm	WSC-470 4mm
Bed Density*, kg/m <sup>3</sup>	420	420
Benzene isotherm loading, dry air at 20°C, %w/w		
288 g/m <sup>3</sup> (90 % of saturation)	45	45
32 g/m <sup>3</sup> (10 % of saturation)	40	40
3.2 g/m <sup>3</sup> (1 % of saturation)	27	27
0.32 g/m <sup>3</sup> (0.1 % of saturation)	15	15
Iodine number, mg/g	1150	1150
Total Surface Area (N <sub>2</sub> BET method**), m <sup>2</sup> /g	1150	1150
Ash content, %w/w	4	4
Specific heat capacity at 100°C, kJ/kg.K	1	1
Ignition temperature, °C	395	395
Pellet diameter, mm	3	4

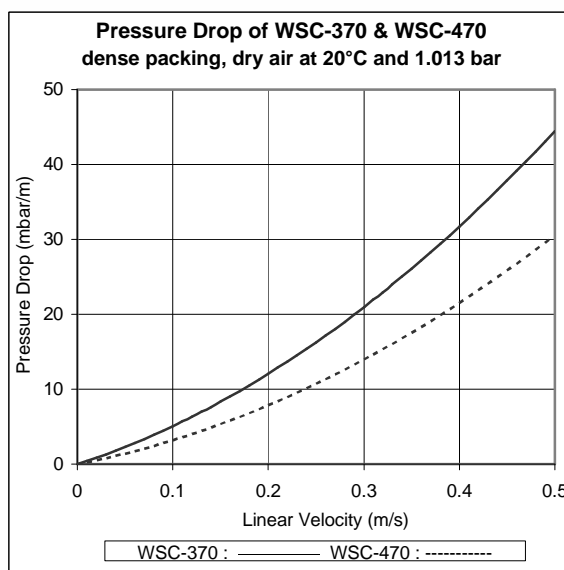
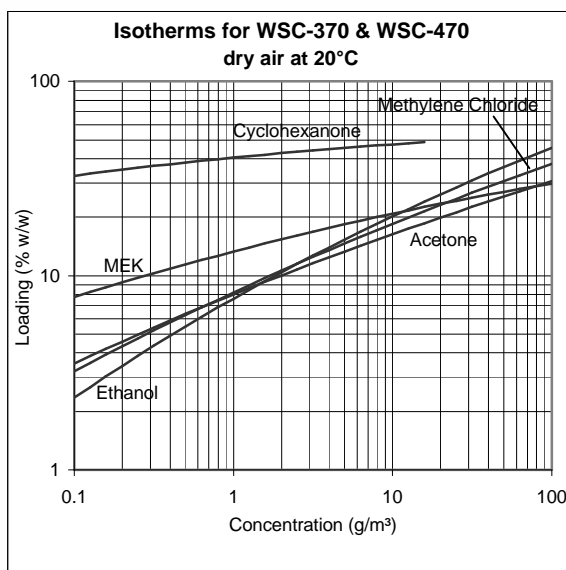
\* Bed Density is used for adsorber sizing

\*\* Brunauer, Emmet and Teller, J. Am. Chem Soc. 60. 309 (1938)

### RECYCLING BY THERMAL REACTIVATION

Once pellet activated carbon is saturated or the treatment objective is reached, it can be recycled, by thermal reactivation, for reuse. Reactivation involves treating the spent carbon in a high temperature reactivation furnace to over 800°C. During this treatment process, the undesirable organics on the carbon are thermally destroyed. Recycling by thermal reactivation is a highly skilled process to ensure that spent carbon is returned to a reusable quality. **Chemviron Carbon** operates Europe's largest reactivation facilities and daily recycles large quantities of spent carbon for a diverse range of customers. Recycling activated carbon by thermal reactivation meets the environmental need to minimise waste, reducing CO<sub>2</sub> emissions and limiting the use of the world's resources.

Chemviron Carbon can offer a recycling service for **WSC-370** and **WSC-470** to avoid disposal of the spent activated carbon.



## DESIGN INFORMATION

The design of an activated carbon treatment system will depend on the nature of the stream to be treated. The following are typical design parameters for organics removal with **WSC-370 & WSC-470** from air:

- Superficial contact time 4-6 s.
- Bed depth 1-2 m
- Linear velocity 0.2-0.4 m/s

## PACKAGING

- 20 kg bags
- Big bags

## SAFETY MESSAGE

Wet activated carbon preferentially removes oxygen from air. In closed or partially closed containers and vessels, oxygen depletion may reach hazardous levels. If workers are to enter a vessel containing carbon, appropriate sampling and work procedures for potentially low-oxygen spaces should be followed.

## QUALITY

Each of our worldwide operations has achieved **ISO9001** certification for their quality management system related to activated carbon. **Chemviron Carbon** guarantees the specifications against representative sampling.

## CHEMVIRON CARBON

**Chemviron Carbon**, the European operation of Calgon Carbon Corporation, is a global manufacturer, supplier, and developer of granular activated carbon, innovative treatment systems, value added technologies, and services for optimising production processes and safely purifying the environment.

With our experience developed since the early years of the twentieth century, facilities around the world and a world-class team of over 1,200 employees, Calgon Carbon Corporation can provide the solutions to your most difficult purification challenges.

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