









AN ACTIVATED CARBON PORTFOLIO TO OPTIMIZE THE PURIFICATION OF PHARMACEUTICAL PREPARATIONS

Whether you are working with early stage drug discovery samples, the scale-up of promising lead compounds, or the manufacturing of bulk drugs and Active Pharmaceutical Ingredients (API), unwanted impurities and byproducts are often formed and must be removed from pharmaceutical preparations. Our activated carbon is an important tool for the purification of new chemical entities (NCE), intermediates and end products.

We use steam or chemical thermal activation processes to convert carbonaceous raw materials into powdered, granular and extruded forms of activated carbon with high porosity and surface area. Cabot manufactures activated carbon with a broad range of functionalities and adsorptive capacities tailored to remove impurities in pharmaceutical preparations, including:

	Proteins	Usually very large, found in many natural products
	Dark colorants (typically dark brown)	Present initially or formed during processing
	Medium colorants (typically light brown/golden)	Present initially or formed during processing
	Natural pigments	Responsible for many color impurities
	Pyrogens	Present initially or formed during processing
	Light colorants (typically yellow)	Present initially or formed during processing
	Color precursors	Responsible for color re-appearance during the storage of finished products
	Odor compounds	Small, relatively volatile compounds

Selection of the most effective activated carbon

There are six basic steps for selecting the right activated carbon for the purification of pharmaceutical preparations.

1. Decide on the basic treatment technology: PAC, GAC or extrudate
2. List the impurities that have to be removed
3. Determine the required purity level of the activated carbon
4. Select your activated carbon
5. Evaluate the performance of your activated carbon
6. Consult with our application specialists to optimize the purification method



Cabot Norit Activated Carbon Product Portfolio – Pharmaceutical Market

Type	Market	Product	Removal of Color Compounds			Removal of Other		Carbon Characteristics	
			Light	Medium	Dark	Odor	Proteins	Purity	Filtration
PAC	Specialty Drugs	NORIT® PUREFLOW C	○	◐	◑	○	◐	◐	●
	Bulk Drugs	NORIT CA1	○	◐	◑	○	◐	◐	◐
		NORIT CN1	○	◐	◑	○	◐	◐	◐
		NORIT SX 1	◐	◑	◒	◐	◐	◑	◐
		NORIT DX ULTRA*)	◐	●	◑	◐	◐	◐	◐
		NORIT CGP SUPER	○	◐	●	○	●	◐	○
	Specialty/Bulk	NORIT SX PLUS LC	◐	◑	◒	◐	◐	●	◐
		NORIT SX ULTRA	◐	◑	◒	◐	◐	◑	◐
		NORIT SX 1 G	◐	◑	◒	◐	◐	◑	◐
		DARCO G 60	◐	◑	◒	◐	◐	◑	◐
		NORIT B TEST EUR	◐	◑	◒	○	◐	◐	●
	API	NORIT E SUPRA USP	◐	◑	◒	○	◐	◐	●
		NORIT A SUPRA EUR	●	◑	○	●	○	●	◐
	Pharmacopeia	NORIT C EXTRA USP	◐	◑	◒	◐	◐	◑	◐
		NORIT A SUPRA EUR/USP	●	◑	○	●	○	●	◐
NORIT ROX 0.8		◐	◑	◒	◐	◐	◑	N/A	
GAC	Specialty/Bulk	NORIT C GRAN	○	◐	◑	○	●	◐	N/A
		NORIT GAC 1240 PLUS	◐	◑	◒	◐	◐	◐	N/A

*) NORIT DX Ultra is only available in the Asia Pacific region

Cabot Norit Activated Carbon Product Portfolio – Colorants

Type	Market	Product	Coloring Power	Purity
PAC	Colorants	NORIT A SPECIAL E153	◑	◑
		NORIT SX SUPER E153	◐	◑

● Best ◐ Better ◑ Good ◒ Fair ○ Poor

Benefits

- ◆ We manufacture ultra-high purity activated carbon grades that meet European Pharmacopoeia and U.S. Pharmacopoeia standards, thereby facilitating the drug registration process
- ◆ Our activated carbons are fully traceable and produced at five Cabot-owned manufacturing plants operating under an ISO 9001:2008 Quality Control System
- ◆ A diverse portfolio of activated carbons to facilitate cost-effective drug discovery, development and manufacturing
- ◆ A well-established technology that is highly effective at removing a range of impurities from:
 - ◆ Analgesics (painkillers)
 - ◆ Enzymes
 - ◆ Antibiotics (Penicillin)
 - ◆ Intravenous solutions
 - ◆ Antipyretics (fever reducers)
 - ◆ New Chemical Entities (NCE)
 - ◆ Active Pharmaceutical Ingredients (API)
 - ◆ Vitamins



NORTH AMERICA
 Cabot Norit Americas, Inc.
 3200 University Avenue
 Marshall, Texas 75670
 USA
T +1 903 923 1000
F +1 903 923 1035

EUROPE, MIDDLE EAST & AFRICA
 Cabot Norit Nederland B.V.
 Astronaut 34
 3824 MJ Amersfoort
 THE NETHERLANDS
T +31 33 4648911
F +31 33 4617429

ASIA PACIFIC
 Cabot China Ltd.
 558 Shuangbai Road
 Shanghai 201108
 CHINA
T +86 21 5175 8800
F +86 21 6434 5532

SOUTH AMERICA
 Cabot Brasil Industria e Comercio Ltda.
 Rua do Paraiso 148 – 5 andar
 Sao Paulo 04103-000
 BRAZIL
T +55 11 2144 6400
F +55 11 3253 0051