









# 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:

	<b>Proteins</b>	Usually very large, found in many natural products
	<b>Dark colorants (typically dark brown)</b>	Present initially or formed during processing
	<b>Medium colorants (typically light brown/golden)</b>	Present initially or formed during processing
	<b>Natural pigments</b>	Responsible for many color impurities
	<b>Pyrogens</b>	Present initially or formed during processing
	<b>Light colorants (typically yellow)</b>	Present initially or formed during processing
	<b>Color precursors</b>	Responsible for color re-appearance during the storage of finished products
	<b>Odor compounds</b>	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*)		◐	●	◐	◐	◐	◐	◐
	Specialty/Bulk		NORIT CGP SUPER	○	◐	●	○	●	◐
		NORIT SX PLUS LC	◐	◑	◒	◐	◐	●	◐
		NORIT SX ULTRA	◐	◑	◒	◐	◐	◑	◐
		NORIT SX 1 G	◐	◑	◒	◐	◐	◑	◐
		DARCO G 60	◐	◐	◒	◐	◐	◐	◐
	API	NORIT B TEST EUR	◐	◑	◒	○	◐	◐	●
		NORIT E SUPRA USP	◐	◑	◒	○	◐	◐	●
	Pharmacopeia	NORIT A SUPRA EUR	●	◑	○	●	○	●	◐
		NORIT C EXTRA USP	◐	◑	◒	◐	◐	◑	◐
		NORIT A SUPRA EUR/USP	●	◑	○	●	○	●	◐
GAC	Specialty/Bulk	NORIT ROX 0.8	◐	◐	◒	◐	◐	◐	N/A
		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)
  - ◆ Antibiotics (Penicillin)
  - ◆ Antipyretics (fever reducers)
  - ◆ Active Pharmaceutical Ingredients (API)
  - ◆ Enzymes
  - ◆ Intravenous solutions
  - ◆ New Chemical Entities (NCE)
  - ◆ Vitamins



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