



NORIT activated carbon

Purification by activated carbon is a proven, modern, state of the art technology for a multitude of purification needs. Nevertheless, the principles have been discovered long back, and activated carbon has had a rich history ever since. The ancient Greeks had already described the use of charcoal to soften the effects of food poisoning. And at the time of Columbus sailors used to blacken the insides of water barrels with fire. They had learned that the water would stay fresh much longer by doing so.

This beneficial behaviour of carbonised materials is caused by the phenomenon that contaminants, organic compounds in most cases, tend to accumulate on surfaces – a process commonly referred to as adsorption. It was adsorption of organic compounds from water that impeded the growth of bacteria in the water barrels the sailors used. Likewise it was adsorption of toxins emitted by invading bacteria that lessened the effects of food poisoning on Greek intestines.

How does activated carbon work

The purifying function of activated carbon is based upon this same principle of adsorption onto carbonised materials. It is the nature of the surface that makes adsorption occur but, in activated carbon, it is the sheer size of the surface that makes it so highly effective; the size of the surface “activates” the carbon. The surface area of activated carbon is impressive, 500 to 1500 m²/g

or even more; a spoonful of activated carbon easily equates the surface area of a soccer field.

It is in the activation process that this surface area is created. The most common process is steam activation; at around 1000 °C steam molecules selectively burn holes into the carbonised raw material, thus creating a multitude of pores inside the carbonaceous matrix. In chemical activation, phosphoric acid is used to build up such a porous system at a lower temperature.

The prime application of activated carbon is in purification. It is the vast porous structure in a carbonaceous matrix that allows activated carbon to catch unwanted contaminants from all sorts of flows, liquid as well as gaseous, in a cost-effective way. But the unique porous structure has led to other uses than purification alone. For instance as catalyst carrier. Or in gold extraction. And new purposes are still found today.

The Purification Company



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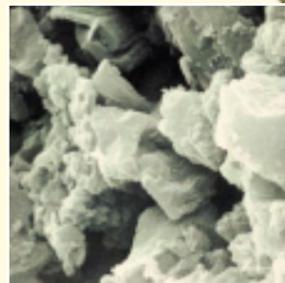
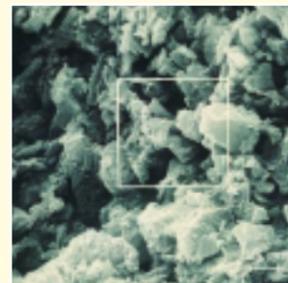
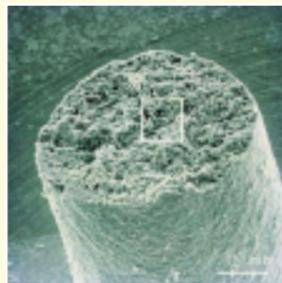


It was almost a century ago that NORIT began the production of activated carbon on an industrial scale. The main use in those days was the decolourisation of sugar syrup in the refining process for producing white sugar. Ever since, NORIT has been one of the most important producers of activated carbon.

Nowadays NORIT Activated Carbon is a global company, leading the way in purification solutions based on activated carbon technology. Our activated carbons are produced or reactivated in a multitude of factories in the Netherlands, Italy, the United Kingdom and the United States, with company participation in factories in

Mexico and Brazil. In steam activation as well as chemical activation we use a wide spectrum of raw materials, such as peat, wood, lignite, coal, coconut shells and even olive pits, to produce a vast array of activated carbon types.

NORIT has the widest product portfolio conceivable in activated carbon. By controlling variations in physical shape (powdered, broken granular or extruded), particle size (from extremely fine powders to 4 mm extrudates), degree of activation, purity, and through specific after-treatments such as impregnation, NORIT can offer a carbon type for every application. "You never need to force fit a NORIT carbon."

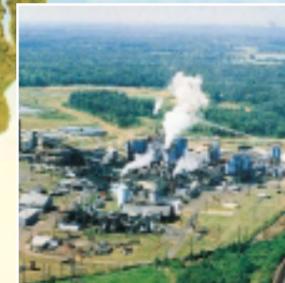
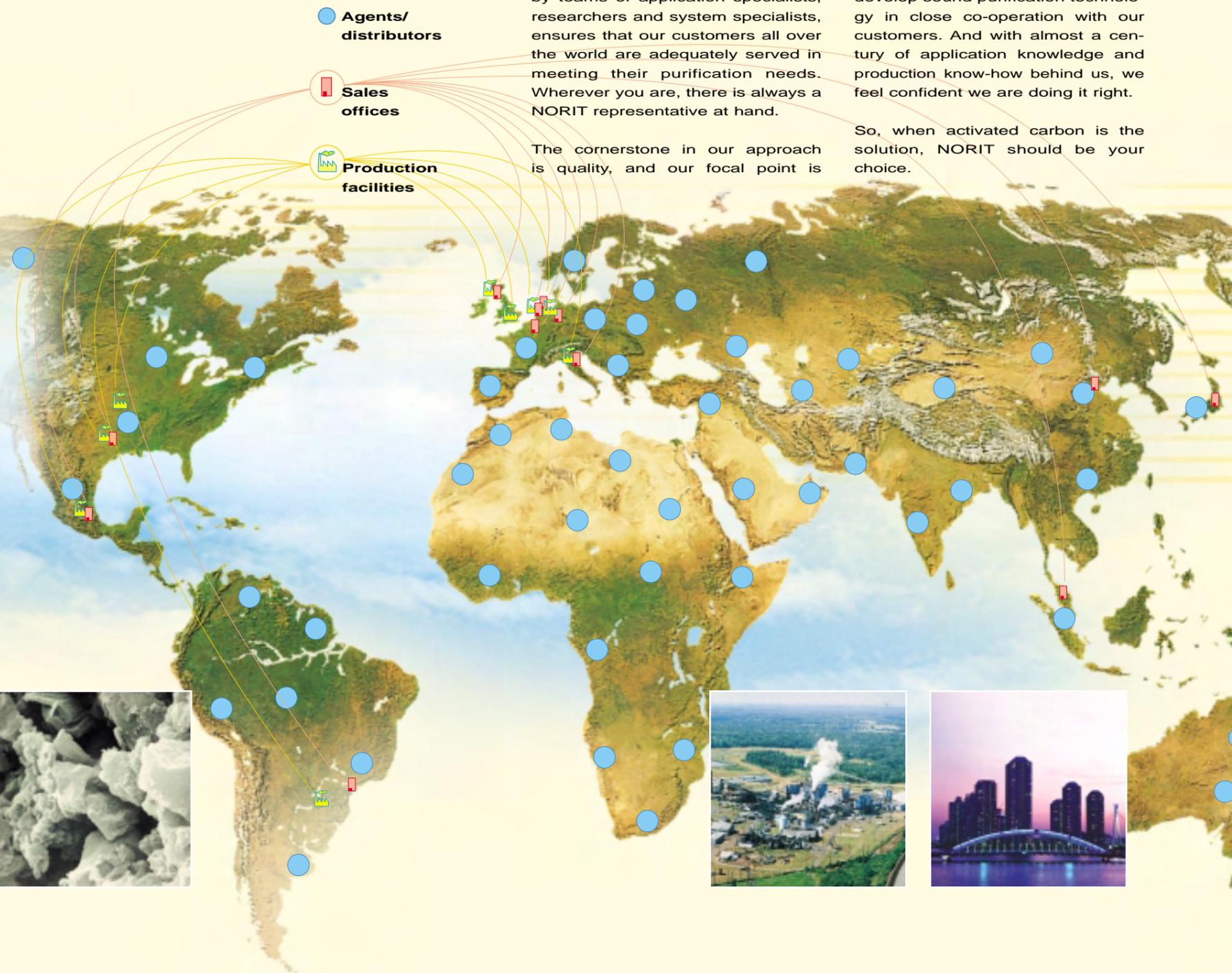


Our global sales network, backed up by teams of application specialists, researchers and system specialists, ensures that our customers all over the world are adequately served in meeting their purification needs. Wherever you are, there is always a NORIT representative at hand.

The cornerstone in our approach is quality, and our focal point is

the customer. We aim to sell and develop sound purification technology in close co-operation with our customers. And with almost a century of application knowledge and production know-how behind us, we feel confident we are doing it right.

So, when activated carbon is the solution, NORIT should be your choice.





Customer care at NORIT means we put you in the central place...

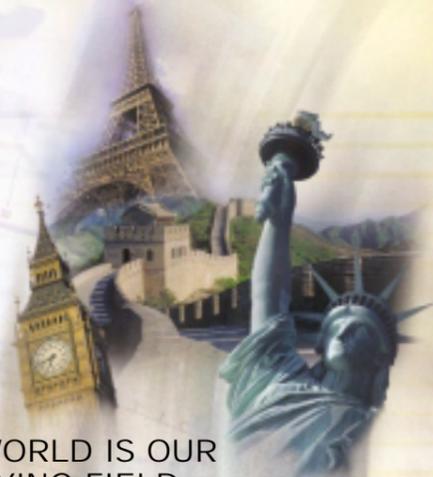


QUALITY



THE WIDEST CHOICE OF ACTIVATED CARBON SOLUTIONS

THE WORLD IS OUR PLAYING FIELD



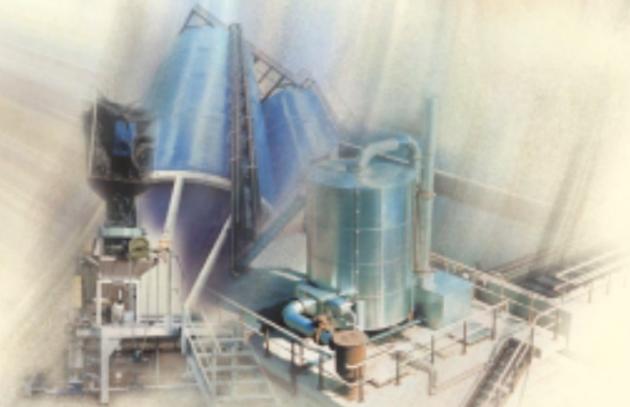
ALWAYS A NORIT REPRESENTATIVE AT HAND



OWN PRODUCTION FACILITIES



TOTAL SOLUTIONS



ALMOST A CENTURY OF APPLICATION KNOW HOW





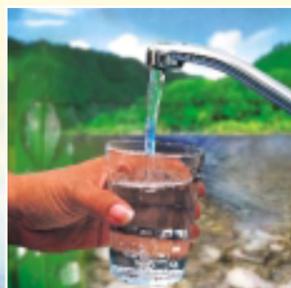
Food

In the food industries NORIT truly is a worldwide player, who offers and sells food grade carbons of controlled purity in a wide array of applications. Whatever you eat, there is a great chance that NORIT activated carbon was used in producing it.



Beverage

You would be surprised to find out the multitude of beverages that have been produced using NORIT activated carbon. Our strictly food grade carbons are successfully applied at any scale of operation you may have, from large bottling plants to small wineries.



Potable Water

NORIT's experience in potable water purification all over the world has led to a balanced and tailor made series of activated carbon types, including our "green" reactivation services, that make it safe to state: 'You never need to force fit a NORIT carbon'.



Pharma

In pharmaceutical industries, reliability, continuity and partnerships are the central themes. NORIT strives to deliver just that, by offering a range of carbons in the highest purity, meeting any pharmaceutical industry standard and quality control under GMP procedures, backed by dedicated application support.



Chemicals

A wide choice of activated carbons assure the best fit for your specific process. Whether you are looking for bulk applications, or for a tailor made process in fine chemicals production, NORIT can help you select the most economical solution.



Wastewater

Price/performance and easy-to-use solutions are NORIT's focal points in the wastewater purification markets. Our focus on cost-effectiveness in environmentally sound solutions is further stressed by our reactivation services, where purification is optimized whilst minimizing carbon consumption.



Gas & Air

NORIT activated carbons are used in a wide array of gas phase applications. From small automotive carbon filters to solvent recovery plants, from emission control in flue gas to end-product purification, our application support can help you select the best solution.



So when purification is your need, NORIT should be your choice....

NORIT activated carbon provides purification solutions based on activated carbon technology, and proudly stands amongst its sister companies providing membranes, valves, CO₂ recovery and analytics under the umbrella of NORIT, the purification company.

Each on our own we can offer you state of the art technology, products and total solutions.

All together we have the possibility to offer you the best performing purification solution to your needs, without having to force fit any of our technologies.

**Today a 1000 applications...
...tomorrow a 1001**

Catalyst

NORIT activated carbons, whether standard or tailor-made, make the perfect catalyst carrier. In comparison with other carriers like silica or alumina, NORIT activated carbons have a greater internal surface area. The optimal carbon type, quality control, application support and dedicated customer contact make sure NORIT can offer the continuity required.



Mining

NORIT continually provides technical expertise, high quality and reliable product to the gold mining industry. The specially developed activated carbons will improve CIL, CIP and CIC plant performance significantly, reducing carbon consumption and gold losses.

