# Using the Gansons Nauta™ Mixer to Improve Mixing Efficiency for a Carbon Black-Based Catalyst

## Background

Carbon black is produced by thermal decomposition/partial combustion of hydrocarbons under controlled conditions. The typical characteristics of carbon black vary with alterations in the manufacturing process. It is employed as a catalyst to increase the rate of reaction in synthesis of active pharmaceutical ingredients (API's). The wet form of carbon black is generally preferred in pharmaceuticals as a catalyst owing to increased rate of reaction in wet form and its greater flammability in dry form.

## Challenge

A uniform amount of moisture (50 - 54%) is essential for efficacy of carbon black as a catalyst in API synthesis. One of our customers was using a drum blender to achieve uniform moisture in the catalyst and was facing challenges in terms of non-uniform moisture distribution, longer process time and agglomeration of catalyst particles.

## Gansons Solution

Gansons proposed conducting the trials using a Gansons Nauta™ Mixer, a low intensity convective mixer. It has a screw flight agitator which lifts the material from the bottom to the top of the product bowl and moves it in clockwise direction. The unique and gentle intermixing currents in the Nauta mixer ensure absence of product agglomeration with high mixing accuracy.

## Results

The material was loaded into the Nauta™ within 5 minutes. Mixing trials were conducted with 50 kg of material in the Nauta™ DBXE 300R model at a screw rpm

of 60 and arm rpm of 1. To prevent agglomeration of the product and ensure uniform moisture distribution, a lump breaker was used in the process for 5 minutes. No changes were observed in physical properties of carbon black after completion of the process (30 minutes). Six samples were withdrawn (two each) from top, middle and bottom layers of the mixer and subjected to evaluation in a moisture analyser. A uniform moisture distribution with absence of lumps was observed in each sample post analysis.

## Highlights

- Over 90% reduction in time as compared to a conventional drum mixer
- Reduced power consumption (96%)
- Additional mixing batches per shift, thus resulting in productivity improvement

## Conclusion

The degree of mixing of carbon black is directly proportional to its effectiveness as a catalyst for synthesis reactions. Hence, the Gansons Nauta™ mixer is recommended to preserve the integrity of this product. Gansons Nauta™ mixers demonstrate properties such as high mixing accuracy, ease of product loading and unloading and low power consumption which lead to increased savings for the customer. Hence, Gansons Nauta™ mixers could be successfully used to mix carbon black based catalysts.

**Please contact us for more information:**

Global: sales@gansons.com
Europe: engineeringUK@gansons.com