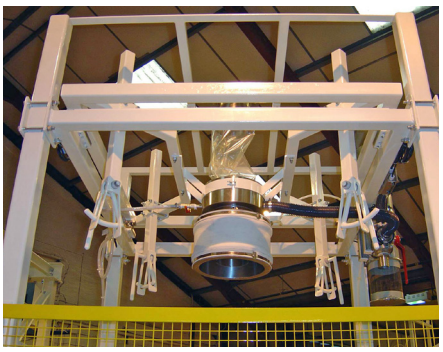
spiroflow | Nanotubes

Case Study
#3021

High Accuracy Bulk Bag Filler Provided to World's 1st Industrial Scale Nanotube Manufacturing Facility

Bulk Bag Filler



The inflatable filling head and quick release bag support latches are all part of the load cell mounted bag weighing frame.

Customer Requirements

Nanocyl S.A. was established in Sambreville, Belgium with the goal of becoming the leading global manufacturer of specialty and industrial Carbon Nanotubes. Nanocyl has become one of the key players in its industry with a production capacity of over 40 tons per year.

- Further capacity increases are being planned to meet customer demand.
- 40 people are employed at its production facility in Sambreville and in their North American office in Alpharetta, Georgia.
- They manufacturer a full range of Carbon Nanotubes including single-walled, double-walled and multi-walled versions.
- The preferred manufacturing method is catalytic carbon vapor deposition (CCVD), which is currently best adapted to large-scale production.
- Nanocyl commercializes its products in the form of powders, pellets, liquid dispersions and films.
- Nanotubes are an emerging technology.
- They are expensive to manufacture and therefore command a high price in the market.
- High accuracy is essential in filling the bulk bags and 4.4lb/ 2kg packs.

What is a Carbon Nanotube?

- **"Carbon Nanotube" is a tube-shaped material, made of carbon, with a diameter measuring on the nanometer scale.**
- **A nanometer is about one 0.0001 as thick as a human hair.**

The measurement on individual tubes due to their intrinsic mechanical and transport properties position them as the ultimate carbon fibers. The best Carbon Nanotubes show a unique combination of stiffness, strength and tenacity compared to other fiber materials that usually lack one of these properties. Intrinsic thermal and electrical conductivity is also very high and comparable to other conductive materials.

Spiroflow Solution

Traditionally, for most industrial applications, Spiroflow offers Bulk Bag Fillers with weighing platforms that use weigh-scales or load-cells.

- Accuracies are typically +/- 2.2lb/ 1kg. To meet Nanocyl's weighing accuracy requirement of +/- 0.7oz/ 20g. Spiroflow engineers decided to successfully adopt the 'hang-weighing' principle for this application.
- The highly sensitive load cells would be mounted high up in the filler, completely out of harm's way.

1 704 246 0953
1609 Airport Road
Monroe, NC 28110 USA

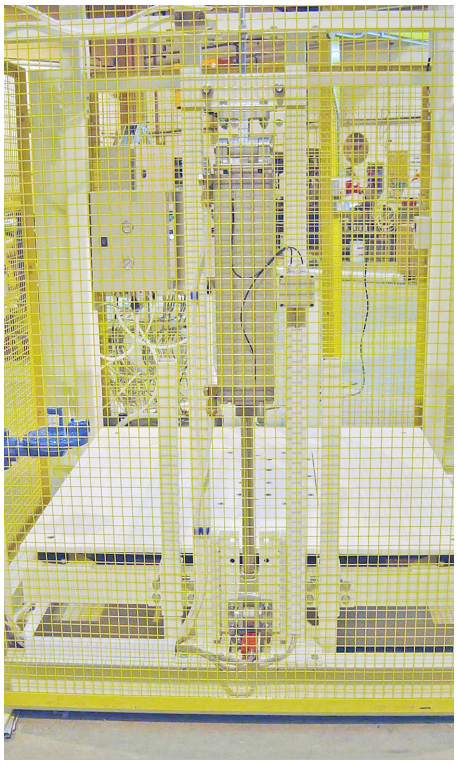
Have a question?
sales@spiroflow.com
www.spiroflow.com

44 (0) 1200 422525
Lincoln Way, Clitheroe
Lancashire BB7 1QG UK

spiroflow | **Nanotubes**

Case Study
#3021

High Accuracy Bulk Bag Filler Provided to World's 1st Industrial Scale Nanotube Manufacturing Facility



Powerful Pneumatic Cylinders Raise and Lower the Base that Vibrates the Bags

Spiroflow Solution Continued

- **The Bulk Bag Filler accurately weighs the contents into the Bulk Bags. It is so accurate that it is also used to fill 4.4 lb/ 2kg bags.**
- **Bulk bag filling takes place under a nitrogen blanket.**
- **A folded, flat bag is rigged onto the Bulk Bag Filler and then the bag is inflated with nitrogen.**
- **Given that ambient air is 78% nitrogen (by volume), the nitrogen displaced as the bulk bags are filled is vented harmlessly through a special filter unit into the atmosphere.**
- **During filling, the base of the Bulk Bag Filler intermittently rises to vibrate the bag and then the base is lowered to allow weighing to continue.**
- **Once the target weight has been achieved and recorded, the bag is given its final vibration.**
- **Vibration is critical to ensure that the contents of each bag are consolidated, making the bags stable and safe for handling and storage.**

The controls were designed and manufactured by Spiroflow's dedicated team of electrical engineers and technicians. The heart of the control box is a highly accurate weighing instrument that receives signals from the high-sensitivity, high-accuracy load cells. These support the bag hanging frame and the quick release bag loop hooks.

The weighing instrument is connected to a printer, allowing batch records to be made and kept. It has been in operation since May 2007.

"It is an excellent machine, custom-made by Spiroflow to meet our exact specifications," Nanocyl said. "It has been performing to our complete satisfaction making us extremely pleased."

How Can Spiroflow Help Your Business?

Contact us today to discuss your specific applications and needs.

1 704 246 0953
1609 Airport Road
Monroe, NC 28110 USA

Have a question?
sales@spiroflow.com
www.spiroflow.com

44 (0) 1200 422525
Lincoln Way, Clitheroe
Lancashire BB7 1QG UK