DPC123

1 REACTOR PLASMA COATER

DESCRIPTION

The DPC123 can coat **containers from 5L up to 30L**. This is a **single reactor** machine and can treat **HDPE & PET** containers.

Speeds are process- & volume-dependent, ranging from **90 to 130 containers/hour** (HDPE) or from **135 to 260 containers/hour** (PET).*

The machine can use 2 technologies:

- Carbon deposition on PET containers, resulting in an **improved O2** (>30x), **CO2** (>7X) and **H20** (>2X) **barrier**.
- Carbon Fluor deposition on HDPE containers, resulting in an **improved solvent barrier**.

** values are indicative and depend on the application, please use our calculation tool*

CONCEPT

Plasma is one of the four fundamental states of matter, besides solid, liquid and gas. Delta Engineering presents a new range of coating machines based on PECVD (plasma-enhanced chemical vapour deposition).

In general, CVD in all its forms achieves very homogeneous surface coatings. However, PECVD has the additional advantage over thermally activated CVD that it can operate at lower temperatures. Moreover, PECVD enables an increased deposition rate.

We have different technologies:

- **On PET:**

  Delta Engineering now offers a PECVD technology depositing thin films from a **gas** state to a solid state on a substrate, such as the inside of bottles. The gas mixture we use contains **acetylene** (C_2H_2). Microwave energy causes the gas to reach its plasma state. The acetylene molecules split into highly reactive methylidyne radicals ($CH^{\bullet}$). They all bind immediately with the inner surface of the bottle, thus creating a **carbon coating**. Hence, it is a **non-exhaust process**. The appropriate **properties** of the coating are obtained by **choosing the right mixture of gases** injected in the bottle.

- **On HDPE:**

  Some of Delta Engineering's new, advanced coating machines imply three steps. In those cases, as a first step, **argon plasma** cleans and etches the inner side of the bottle, making it **easier to be chemically modified**. As a second step, a **carbon layer** is added with the coating technology using **acetylene**, as described above. In a third step, we use **R134a**, a well-known **HFC**. With microwaves, the HFC-molecules of R134a are broken down and create a **protecting carbon-fluorine layer** inside the bottle.

The latter three-steps technology is quite remarkable. Today, most technologies fluorinate by means of direct fluorination. However, this method is under pressure because of the dangers of escaping gas, which is not environmentally friendly and might intoxicate workers. Delta Engineering's new solution, by contrast, allows fluorination using plasma treatment. Using this method, **no gas gets into the atmosphere**. Instead of fluorine gas, we use the **non-ozone depleting R134a**. This R134a is also known as a refrigerant, one that is very common indeed and is used in a wide range of refrigeration and air conditioning applications.

STANDARD FEATURES AND OPTIONS

Standard features include

- Process control ensures that the coated containers are of good quality
- 19" operator touch screen with graphical support for easy adjustment
- Quick product change system
- Easy operator access
- Data logging
- Cooling system (microwave, pumps, etc.)
- Total cost measuring (energy, gas usage, etc.)
- Big safety doors & safety in-/outfeed hinged shielding for easy access

Options

- Laser/inkjet printer interface

ADVANTAGES

- **Can treat PET & HDPE containers**
- **Improved O2, CO2, H20 barrier (PET)**
- **Improved solvent barrier (HDPE)**
- **Low-cost barrier options**

GENERAL SPECIFICATIONS

- Frame — Powder coated welded steel frame (RAL7035)
- Conveyor — Aluminium frame/profile, flat belt or chain conveyor
- Frame dimensions — (excluding shields & conveying)
  - Infeed height — Minimum 1100mm – maximum 1200mm
  - Width — 2250mm
  - Length — 3920mm
- Weight — +/- 3000 Kg (depending on type and options)
  - Air supply — ½" connection, Max 10bar (145PSI), 6bar (87PSI) recommended
  - Supply voltage — 3x380-480 VAC + N – 50A – 50/60Hz
- Control board
  - ✓ Main controls — Siemens
  - ✓ Graphical user interface — Siemens