

Anti-Static Semi-Bulk Containers

FOR USE WITH DUPONT™ TI-PURE® TITANIUM DIOXIDE

Safety is a core value at DuPont for both our internal operations and for our customers. For this reason Ti-Pure® TiO₂ is supplied in specially designed Semi-Bulk Containers (SBCs) to prevent fire and explosions in operations where flammable vapors are or may be present.



Electrostatic Charge and SBCs

Electrostatic charging occurs as non-conductive solids flow into or out of SBCs made from an insulative fabric such as polypropylene. This can result in electrical discharges from the bag surface, posing a fire or explosion hazard if flammable vapors are present. For this reason DuPont ships Ti-Pure® TiO₂ in special static-dissipative SBCs constructed from Crohmiq Blue™ fabric manufactured by Linq Industrial Fabrics. Special conductive fibers incorporated into this fabric ensure that electrostatic charge is safely dissipated by non-incendive corona discharges. SBCs made from Crohmiq Blue™ fabric do not require grounding to be effective. The safety of packages utilizing this design is recognized by National Fire Prevention Association publication NFPA-35, "Standard for the Manufacture of Organic Coatings," provided that claims are validated by means of full-scale tests.

Qualifying 'Electrostatically Safe' SBCs

The International Electrotechnical Commission (IEC) has established a working group to develop an SBC safety testing standard. The current IEC draft standard specifies a qualification test for Type 'D' SBCs in which the bag is charged at a 3 microamp current by means of recirculating polypropylene pellets. Electrostatic discharges from the bag surface are then initiated by approaching it with a grounded test probe containing a flammable gas mixture of 0.14 mJ ignition energy; most flammable solvents of commercial importance have ignition energies above this level.

A statistically significant number of ignition attempts are conducted for filling and emptying of the bag under both low and high humidity conditions. The SBC is considered electrostatically safe if no ignitions of gas in the probe occur during the test program.



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Ti-Pure® SBCs Meet the Standard

Both new and 3-cycle water washed Crohmiq Blue™ SBCs currently being used by DuPont have passed the proposed IEC test standard on numerous occasions. Data for a water-washed SBC is shown below.

Alternatives

Conductive groundable SBC designs to prevent electrostatic hazards are available. However, these require that a positive connection to ground be established to ensure safety. If such a ground is not present the sparking hazard can actually increase.

Our experience has taught us that failure to connect grounding straps or to maintain their effectiveness does occur. We believe that the Crohmiq Blue™ SBC provides a safer option since it requires no ground connection to be safe.

Conclusions

It is our belief that the Ti-Pure® SBC used by DuPont represents one of the safest options on the market today based on the results of tests performed per a new international standard along with the fact that in ten years over five million Crohmiq Blue™ SBCs have been used in flammable vapor environments throughout the world without incident.

3-Cycle Water Washed SBC: 71°C/21% RH

Charge Rate (mA)	Gas Probe Ignition Energy (mJ)	Test Mode	No. of Ignition Attempts	No. of Ignitions
3.0	0.14	Fill	200	0
3.0	0.14	Empty	60	0

3-Cycle Water Washed SBC: 74°F/61% RH

Charge Rate (mA)	Gas Probe Ignition Energy (mJ)	Test Mode	No. of Ignition Attempts	No. of Ignitions
3.0	0.14	Fill	200	0
3.0	0.14	Empty	60	0

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