

[http://www2.dupont.com/Tyvek/en\\_US/products/product\\_properties.html#msds](http://www2.dupont.com/Tyvek/en_US/products/product_properties.html#msds)

**OUTSTANDING CHEMICAL RESISTANCE** Spunbonded Olefin is inert to most acids, bases and salts. Prolonged exposure to oxidizing substances, such as concentrated nitric acid or sodium persulfate, will cause some loss of strength.

**WITHSTANDS DEFORMATION** Elevated temperatures increase the sensitivity to tension-caused width loss and deformation. For example, Style 1073D can withstand 1.5 lb/lineal in. width (2.6 N/cm) tension at room temperature, but at 225°F (107°C), tension in excess of 0.6 lb/lineal in. width (1.1 N/cm) will cause permanent deformation

**GOOD DIMENSIONAL STABILITY** Sheet dimensions change less than 0.01% between 0 and 100% relative humidity at constant temperature.

**FDA REQUIREMENTS** Styles 1059B and 1073B meet the requirements of Title 21 of the United States Code of Federal Regulations (21 CFR 177.1520) for direct food contact applications (such as food packaging; desiccant, de-oxidizing agent or other "active packaging;" and direct contact labels) where the temperatures do not exceed 212°F (100°C).

**FLAMMABILITY** The flammability characteristics of Spunbonded Olefin, a synthetic nonwoven material, are similar to those of most synthetic fibers. When exposed to a flame, Spunbonded Olefin shrinks away rapidly. If the flame is made to follow the shrinking sheet, Spunbonded Olefin will melt at 275°F (135°C), and if its auto-ignition temperature of 750°F (400°C) is reached, it will burn. Type 10 Spunbonded Olefin is rated class "A" when tested in accordance with ASTM E- 84-89a. Types 14 and 16 are rated "Class 1—Normal Flammability" by the Federal Flammable Fabrics Act for Clothing Textiles (16 CFR-1610). Spunbonded Olefin does not pass DOC FF3-71, Children's Sleepwear Test.\* Spunbonded Olefin and laminates of Spunbonded Olefin are not intended for use in fire-retardant garments. The user should ensure that Spunbonded Olefin meets all flammability standards for the application.

**REMARKABLE FLEXIBILITY** Spunbonded Olefin has outstanding flexural strength and will easily exceed 20,000 cycles when tested on an MIT flex tester (TAPPI method T-423).

**LOW-LINTING** Because Spunbonded Olefin is composed of essentially continuous fibers, it does not generate a significant amount of lint particles under conditions of ordinary use.

**LIGHT WEIGHT** Type 10 has a density of approximately 0.38 g/cc, which is only half as much as paper.

**SUPERIOR MOISTURE RESISTANCE** The physical properties of Spunbonded Olefin are not affected by water; Spunbonded Olefin is equally strong wet or dry under ordinary conditions and ambient temperature.

**GOOD LIQUID BARRIER PROTECTION** Spunbonded Olefin with neither corona treatment nor antistatic agent (e.g., Style 1073B) has a hydrostatic head in excess of 50 in. (127 cm). If antistat is applied, the hydrostatic head will drop to 40-50 in. (102-127 cm). Corona treated and antistated Spunbonded Olefin (e.g., Style 1073D) has a hydrostatic head that is less than 15 in. (38 cm).

**HIGH OPACITY** The high opacity of Spunbonded Olefin is the result of multiple light refractions among the very fine polyethylene fibers and air within the densely packed sheet structure.

**WHITENESS** Spunbonded Olefin is one of the whitest materials available for printing. The GE Brightness of Spunbonded Olefin (using the TAPPI Standard Test Method/ Technidyne Instrument) is 94.1. For purposes of comparison, a pure titanium dioxide pellet measures 93.8. Color value, or whiteness, is also defined by L,a,b values. The Hunterlab Model D-25 color difference meter measures the brightness, color components and whiteness. The following values are typical for Type 10:

**POROSITY** Compared with most textile fabrics, the air permeability of Types 10 and 14 is low. Moisture-vapor transmission is much higher than that of plastic films and similar to that of coated papers.

**EXCELLENT MOLD & MILDEW RESISTANCE** Although mold and mildew can grow on Spunbonded Olefin, it shows no degradation after being buried in soil for an extended period. Clean Spunbonded Olefin will not promote the formation of mildew.

**SOILING** Resistance is high to soiling by waterborne soils, but is low to absorption of oils and greases. Types 14 and 16 can be laundered. For more information, contact DuPont at 1-800-448-9835.

**NEUTRAL pH** Spunbonded Olefin has a neutral pH = 7. Therefore, it is neither acidic nor basic. The styles that are corona treated and antistatic treated also have a pH = 7.

**STATIC** In some processing steps, Spunbonded Olefin may generate static electricity unless treated with antistatic agents. These agents, while suppressing static generation and increasing wettability, have no effect on sheet strength. Most types and styles of Spunbonded Olefin as supplied by DuPont are treated with antistatic agents. All treated styles of Types 14 and 16 have a static decay of <0.1 second when tested according to method 4046 of Federal Test Method Standard 101 C after 25 hours conditioning at 70°F (21°C) and 50% relative humidity (RH). This topical antistat is water soluble and is not intended as a “safety” feature. For this reason, it is recommended that garments of Spunbonded Olefin not be used in flammable or explosive environments. Styles with a B suffix do not contain an antistatic agent. Styles like these with no antistatic agent can build a static charge during roll or sheet handling and should not be handled in areas where the potential for explosive vapor/air mixtures exists.

**TEMPERATURE RANGE** Toughness and flexibility are retained down to -100°F (-73°C). When exposed to heat, Spunbonded Olefin begins to shrink at approximately 270°F (132°C) and melts at 275°F (135°C). Under actual processing conditions, where tension is required to handle the web, the web temperature should not exceed 175°F (79°C).

**UV RESISTANCE** Physical properties of Spunbonded Olefin are degraded with extended exposure to direct sunlight (ultraviolet rays), although at least one to three months of useful outdoor life can be expected in many applications. UV resistance can be improved with opaque coatings. Styles of Spunbonded Olefin containing UV inhibitors are available for applications requiring higher UV resistance.

**SOLVENT RESISTANCE** Water and highly polar solvents have very little effect on the properties of Tyvek® brand spunbonded olefin. However, certain solvents used in some inks, paints, adhesives and coatings can cause swelling. The swelling effect of a solvent is usually reversible after it evaporates from Spunbonded Olefin. However, if a vehicle or binder is present in the solvent, the distortion caused by the solvent is likely to be permanent. Solvent distortion can be minimized by rapid evaporation or drying in an oven. As an example, a sheet-fed offset lithographic ink containing 25% volatile solvent will cause severe distortion of Spunbonded Olefin 20 minutes after printing. The same ink printed on a heat-set web offset press and dried in an oven at 200°F (93°C) will be distortion free. Swelling of Spunbonded Olefin can also be caused by some plasticizers, aliphatic hydrocarbon resins used in inks, tackifiers and low-molecular weight adhesives. The swelling caused by these materials is always permanent and, in some cases, is not apparent until several days or weeks after application.

**TOXICITY** Spunbonded Olefin, as supplied by DuPont, has been tested for toxicity by skin contact tests on animals and humans. No reports of toxic reactions have been received. Spunbonded Olefin is not radioactive, is stable in all recommended use environments and requires no special spill procedures.

**MSDS** Spunbonded Olefin is considered an “article” under provisions of the Toxic Substance Control Act (TSCA) and is considered nonhazardous under provisions of the Hazard Communication Standard. No Material Safety Data Sheet (MSDS) is required for Spunbonded Olefin, although one is available as a service to customers.