



# Teflon®/Tefzel®/Zonyl®

fluoropolymer resins and fluoroadditives

## **Teflon®/Tefzel® Fluoropolymer Resins and Zonyl® Fluoroadditives in Applications Regulated by the Food and Drug Administration**

This data sheet pertains to the U.S. Federal Food and Drug Administration (FDA) regulations governing the use of fluoropolymers as articles or components of articles intended for use in contact with food.

### **Articles Intended to Contact Food**

*Reference:* 21 CFR 177.1550 Perfluorocarbon Resins

Most *Teflon*® PTFE and FEP fluoropolymer resins may be used as articles or components of articles intended to contact food in compliance with this regulation. A partial list of resins that meet the requirements of this regulation is given in **Table 1**.

*Teflon*® PFA type fluoropolymer resins listed in **Table 1** have been approved by the FDA for repeated-use food contact articles such as tubing, hoses, components of valves, etc., as well as for coatings for articles intended for repeated food contact use in compliance with this regulation.

Some fluoropolymer resins are irradiated to facilitate grinding into fine powders for applications needing a very small particle size. Paragraph (c) specifies the allowable dose of radiation and maximum particle size for PTFE resins so processed and restricts their use to components of articles intended for repeated use in contact with food. **Table 1** shows the *Zonyl*® fluoroadditives that comply with this paragraph.

### **Processing Aids for Polyolefins**

*Reference:* 21 CFR 177.1520 Olefin Polymers

*Zonyl*® fluoroadditives MP 1500J and MP 1600N; *Teflon*® PTFE and FEP resins listed in **Table 1**; and up to 2,000 ppm of *Zonyl*® fluoroadditives MP 1000, MP 1300, and MP 1400 may be used as extrusion aids for polyolefins in compliance with this regulation as long as the polyolefin resin complies with the regulation.

### **Components of Resinous and Polymeric Coatings**

*Reference:* 21 CFR 175.300 Resinous and Polymeric Coatings

As indicated in **Table 1**, most *Teflon*® fluoropolymer resins and *Zonyl*® fluoroadditives may be used as release agents in compliance with this regulation as long as the finished coating meets the extractives limitations of the regulation. Both because of the small amount required for a release agent and its insolubility, the PTFE would be expected to contribute a negligible amount to the extractables, but it is the customer's responsibility to measure extractives on finished coating to ensure compliance.

### **Components of Paper and Paperboard**

*Reference:* 21 CFR 176.170 Components of Paper and Paperboard in Contact with Aqueous and Fatty Foods

As indicated in **Table 1**, most *Teflon*® fluoropolymer resins and *Zonyl*® fluoroadditives may be used as release agents in compliance with this regulation as long as the finished coating meets the extractives limitations of this regulation. Both because of the small amount required for a release agent and its insolubility, the PTFE would be expected to contribute a negligible amount to the extractables, but it is the customer's responsibility to measure extractives on finished coating to ensure compliance.

*Reference:* 21 CFR 176.180 Components of Paper and Paperboard in Contact with Dry Food

As indicated in **Table 1**, most *Teflon*<sup>®</sup> fluoropolymer resins and *Zonyl*<sup>®</sup> fluoroadditives may be used as release agents in compliance with this regulation.

### **Lubricant for Rubber Articles**

*Reference:* 21 CFR 177.2600 Rubber Articles Intended for Repeated Use

The *Teflon*<sup>®</sup> PTFE and FEP resins and the *Zonyl*<sup>®</sup> fluoroadditives indicated in **Table 1** can be used as lubricants for rubber articles intended for repeated use in contact with food in compliance with this regulation.

### **Components of Adhesives**

*Reference:* 21 CFR 175.105 Adhesives

The *Teflon*<sup>®</sup> PTFE resins listed in **Table 1** and *Zonyl*<sup>®</sup> fluoroadditives MP 1000, MP 1300, MP 1400, MP 1500J, and MP 1600N may be used as components of adhesives in compliance with this regulation.

### **Tefzel<sup>®</sup> Fluoropolymers**

*Tefzel*<sup>®</sup> 200, 210, 220, and 280 may be used as articles or components of articles intended for repeat-use food processing applications, in contact with all food types at temperatures up to 121°C (250°F) in compliance with the Federal Food, Drug, and Cosmetic Act and the applicable regulations.

### **Colorants in Polymers**

*Reference:* 21 CFR 178.3297 Colorants for Polymers

This regulation permits certain colorants for use in polymers intended for food contact use. Included are TiO<sub>2</sub>, iron oxides, all-gas channel black, and ultramarine colorants.

### **Housewares Exemption**

*Reference:* Food Drug Cosmetic Law Journal, Vol. 42, No. 1, January 1987, p. 45

The housewares exemption holds that substances sold for use in housewares such as dinnerware or eating utensils need no FDA clearance. This exclusion flows from the legislative history of the 1958 Amendment to the FD&C Act, and FDA's position has been that it will not require Food

Additives Amendment-type clearance of materials used to manufacture empty containers, utensils, or appliances sold to the consumer for home use.

### **USDA Acceptance**

The United States Department of Agriculture (USDA) has accepted *Teflon*<sup>®</sup> PTFE, FEP, and PFA fluoropolymer resins that comply with 21 CFR 177.1550 as components of materials in direct contact with meat or poultry food products prepared under Federal inspection. Resins that comply with this regulation are shown in **Table 1**.

### **3-A Sanitary Standards**

*Teflon*<sup>®</sup> PTFE, FEP, PFA, and *Tefzel*<sup>®</sup> fluoropolymer resins comply with the Criteria in "3-A Sanitary Standards for Multiple-Use Plastic Materials Used as Product Contact Surfaces for Dairy Equipment, Number 20-17," published by the 3-A Secretary, Dairy and Food Industries Supply Association, Inc.

### **US Pharmacopeia Class VI**

Representative samples of *Teflon*<sup>®</sup> PTFE, FEP, PFA, and *Tefzel*<sup>®</sup> fluoropolymers have been tested in accordance with USP protocol, and all meet the requirements of a USP Class VI plastic. These tests on representative samples may not reflect results on articles made from these fluoropolymers, especially if other substances are added during fabrication. Testing of the finished article is the responsibility of the manufacturer or seller of the finished product if certification that it meets USP standards is required.

USP testing was done to support use of these fluoropolymers in pharmaceutical processing and food processing applications. While USP Class VI certification is not required for pharmaceutical processing, many pharmaceutical customers seeking ISO-9000 certification have requested it.

### **Medical Use**

**Caution:** Do not use *Teflon*<sup>®</sup> or *Tefzel*<sup>®</sup> fluoropolymers or *Zonyl*<sup>®</sup> fluoroadditives in medical applications involving permanent implantation in the human body. For other medical applications, see "DuPont Medical Caution Statement," H-50102.

DuPont does not make surgical or medical grades of *Teflon*<sup>®</sup> or *Tefzel*<sup>®</sup> resins and does not guarantee continuity of process in our manufacturing operations as changes may occur from time to time.

**Table 1**  
**Summary of DuPont Fluoropolymer Resins and Fluoroadditives**  
**Complying with FDA Regulations<sup>1</sup>**

<b>Products</b>	<b>21 CFR 177.1550</b>	<b>21 CFR 177.1520</b>	<b>21 CFR 177.2600</b>	<b>21 CFR 175.300</b>	<b>21 CFR 175.105</b>	<b>21 CFR 176.170</b>	<b>21 CFR 176.180</b>
<i>Teflon</i> <sup>®</sup> PTFE Granular Resins 7A, 7C, 8, 8A, 8B, 9B, 701N, 703N, 801N, 807N, 809N, 850A, 901N, L129, TG70J, TG170J	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Teflon</i> <sup>®</sup> PTFE Fine Powders 6C, 6CN, 60, 62, 62N, 636N, 637N, 669N, 669RFFN, K-10, 67 CFP6000, CFP6000N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DuPont PTFE 65, 65J, 65N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DuPont PTFE Dispersions <sup>2</sup> 30, 30B, 30N, K-20	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Teflon</i> <sup>®</sup> FEP Resins 100, 100N, 100J, 140, 140N, 140J, 160, 160N, 4100, 4100N, 5100	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DuPont FEP Dispersions <sup>2</sup> 120, 121A	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Teflon</i> <sup>®</sup> PFA Resins 440HP, 450HP	Yes <sup>3</sup>	No	No	Yes <sup>3</sup>	Yes <sup>3</sup>	Yes <sup>3</sup>	Yes <sup>3</sup>
<i>Zonyl</i> <sup>®</sup> Fluoroadditives MP 1000, MP 1300	No	2000 ppm maximum	No	Yes	Yes	Yes	Yes
<i>Zonyl</i> <sup>®</sup> Fluoroadditives MP 1400	Yes <sup>3</sup>	2000 ppm maximum	Yes	Yes	Yes	Yes	Yes
<i>Zonyl</i> <sup>®</sup> Fluoroadditives MP 1500J, MP 1600N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Tefzel</i> <sup>®</sup> Fluoropolymers 200, 210, 220, 280	See accompanying text.						

<sup>1</sup>See accompanying text and the FDA regulations for any limitations or conditions of use. It is the customer's responsibility to test finished articles to ensure compliance with the extractives limitations of applicable regulations.

<sup>2</sup>Articles made from dispersions sintered at high temperatures common to the industry should comply (see Note 1). Articles made from unsintered dispersions do not comply.

<sup>3</sup>Limited to articles or components of articles for repeated use in contact with food.

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