EASTMAN

# Technical Data Sheet

## Eastman™ MXF221 copolyester

## Applications

- Medical equipment
- Medical housings and hardware

## Key Attributes

- Color retention after disinfection
- Ease of processing
- Excellent Notched Izod impact strength before and after disinfection
- Excellent chemical resistance to a wide variety of hospital disinfectants and wipes
- Excellent hydrolytic stability
- Excellent toughness
- Fast cycle times
- Fast drying times

## Product Description

Eastman™ MXF221 copolyester is an amorphous material. Eastman™ MXF221 copolyester contains a mold release derived from vegetable based sources. Eastman™ MXF221 copolyester has many outstanding features that include excellent toughness, hydrolytic stability, heat resistance, chemical resistance, and melt flowability. Eastman™ MXF221 copolyester has been formulated for medical devices. Eastman™ MXF221 copolyester has passed FDA/ISO 10993 testing for cytotoxicity, skin sensitization, and intracutaneous reactivity.

## Typical Properties

| Property[a] | Test Method[b] | Typical Value, Units[c] |
|---|---|---|
| **General Properties** | | |
| Specific Gravity | D 792 | 1.19 |
| Mold Shrinkage | D 955 | 0.003-0.006 mm/mm (0.003-0.006 in./in.) |
| **Mechanical Properties** | | |
| Tensile Stress @ Yield | D 638 | 47 MPa (6800 psi) |
| Tensile Stress @ Break | D 638 | 50 MPa (7300 psi) |
| Elongation @ Yield | D 638 | 5 % |
| Elongation @ Break | D 638 | 132 % |
| Tensile Modulus | D 638 | 1671 MPa (2.42 x $10^5$ psi) |
| Flexural Modulus | D 790 | 1847 MPa (2.68 x $10^5$ psi) |
| Rockwell Hardness, R Scale | D 785 | 111 |
| Izod Impact Strength, Notched | | |
| @ 23°C (73°F) | D 256 | 1077 J/m (20.2 ft·lbf/in.) |
| Impact Strength, Unnotched | | |
| @ 23°C (73°F) | D 4812 | NB |
| **Optical Properties** | | |
| Total Transmittance[d] | D 1003 | 81 % |
| Haze[d] | D 1003 | 2 % |
| **Thermal Properties** | | |
| Deflection Temperature | | |
| @ 0.455 MPa (66 psi) | D 648 | 90 °C (194 °F) |
| @ 1.82 MPa (264 psi) | D 648 | 76 °C (169 °F) |
| Flammability | | |
| @ Thickness 1.5 mm | UL 94 | V2 |
| @ Thickness 3.0 mm | UL 94 | V2 |

| Typical Processing Conditions | |
|---|---|
| Drying Temperature | 88 °C (190 °F) |
| Drying Time | 4-6 hrs |
| Processing Melt Temperature | 240-290 °C (464-555 °F) |
| Mold Temperature | 24-66 °C (75-150 °F) |

[a]*Unless noted otherwise, all tests are run at 23°C (73°F) and 50% relative humidity.*
[b]*Unless noted otherwise, the test method is ASTM.*
[c]*Units are in SI or US customary units.*
[d]*These properties can be modified by adjustment to melt temperature and melt residence time.*

# Eastman Medical Disclaimer

It is the responsibility of the medical device manufacturer ("Manufacturer") to determine the suitability of all component parts and raw materials, including any Eastman product, used in its final product in order to ensure safety and compliance with requirements of the United States Food and Drug Administration (FDA) or other international regulatory agencies. Eastman products have not been designed for nor are they promoted for end uses that would be categorized by either the United States FDA or by the International Standards Organization (ISO) as implant devices. Eastman products are not intended for use in the following applications: (1) in any bodily implant applications for greater than 30 days, based on FDA-Modified ISO-10993, Part 1 "Biological Evaluation of Medical Devices" tests (including any cosmetic, reconstructive or reproductive implant applications); (2) in any cardiac prosthetic device application, regardless of the length of time involved, including, without limitation, pacemaker leads and devices, artificial hearts, heart valves, intra-aortic balloons and control systems, and ventricular bypass assisted devices, or (3) as any critical component in any medical device that supports or sustains human life. For manufacturers of medical devices, biological evaluation of medical devices is performed to determine the potential toxicity resulting from contact of the component materials of the device with the body. Tests are defined in FDA-Modified ISO-10993, Part 1 ''''Biological Evaluation of Medical Devices''''. Limited testing information for certain Eastman products is available upon request. The Manufacturer of the medical device is responsible for the biological evaluation of the finished medical device. The suitability of an Eastman product in a given end-use environment is dependent upon various conditions including, without limitation, chemical compatibility, temperature, part design, sterilization method, residual stresses, and external loads. It is the responsibility of the Manufacturer to evaluate its final product under actual end-use requirements and to adequately advise and warn purchasers and users thereof.

# Comments

Properties reported here are typical of average lots. Eastman makes no representation that the material in any particular shipment will conform exactly to the values given. The processing melt temperature and mold temperature refer to the actual resin melt temperature and actual mold surface temperature respectively. Consider overall resin residence time, part shot size utilization and part geometry to set appropriate processing melt temperature and mold temperature in order to minimize IV loss and maximize molded part performance.

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