

**PA 2210 FR**

PA12 FR

EOS GmbH - Electro Optical Systems

**Product Texts**
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## Product information

PA 2210 FR is a polyamide 12 for processing in laser sintering systems with a halogen free, chemical flame retardant. In case of fire a carbonating coating arises on the surface of the part, isolating the plastic below.

## Properties

- free of halogens
- higher stiffness compared to unfilled PA 12

## Acceptance criteria

- JAR 25 (aviation)
- UL 94 (Electrical & Electronics)

## Typical applications

- aviation (e.g. air ducts)
- plastic parts in devices and appliances (e.g. E&E housings)

3D Data	dry / cond	Unit	Test Standard
The properties of parts manufactured using additive manufacturing technology (e.g. laser sintering, stereolithography, Fused Deposition Modelling, 3D printing) are, due to their layer-by-layer production, to some extent direction dependent. This has to be considered when designing the part and defining the build orientation.			
Tensile Modulus (X Direction)	<b>2500 / 2400</b>	MPa	ISO 527-1/-2
Tensile Modulus (Y Direction)	<b>2500 / 2400</b>	MPa	ISO 527-1/-2
Tensile Modulus (Z Direction)	<b>2300 / 2200</b>	MPa	ISO 527-1/-2
Tensile Strength (X Direction)	<b>46 / 43</b>	MPa	ISO 527-1/-2
Tensile Strength (Y Direction)	<b>46 / 43</b>	MPa	ISO 527-1/-2
Tensile Strength (Z Direction)	<b>41 / 38</b>	MPa	ISO 527-1/-2
Strain at Tensile Strength (X Direction)	<b>4 / 6</b>	%	ISO 527-1/-2
Strain at Tensile Strength (Y Direction)	<b>4 / 6</b>	%	ISO 527-1/-2
Strain at Tensile Strength (Z Direction)	<b>3 / 4</b>	%	ISO 527-1/-2
Strain at break (X Direction)	<b>4 / 7</b>	%	ISO 527-1/-2
Strain at break (Y Direction)	<b>4 / 7</b>	%	ISO 527-1/-2
Strain at break (Z Direction)	<b>3 / 4</b>	%	ISO 527-1/-2
Flexural Modulus (23°C, X Direction)	<b>2300 / -</b>	MPa	ISO 178
Flexural Strength (X Direction)	<b>65 / -</b>	MPa	ISO 178

Thermal properties	dry / cond	Unit	Test Standard
Melting temperature (20°C/min)	<b>185 / *</b>	°C	ISO 11357-1/-3
Flammability test passed	<b>1.7</b>	mm	CS 25 / JAR25 / FAR 25 § 25-853 12s Ignition Time
Flammability test passed	<b>2.0</b>	mm	CS 25 / JAR25 / FAR 25 § 25-853 12s Ignition Time
Smoke Density test passed	<b>1.7</b>	mm	ABD 0031 (Issue:F), method: AITM 2.0007
Smoke Density test passed	<b>2.0</b>	mm	ABD 0031 (Issue:F), method: AITM 2.0007
Toxicity test passed	<b>1.7</b>	mm	ABD 0031 (Issue:F), method: AITM 3.0005

Toxicity test passed	<b>2.0</b>	mm	ABD 0031 (Issue:F), method: AITM 3.0005
Burning behavior test passed	<b>1.1</b>	mm	UL 94 HB
Burning behavior test passed	<b>1.2</b>	mm	UL 94 HB
Burning behavior test passed	<b>1.3</b>	mm	UL 94 HB
Burning behavior test passed	<b>1.4</b>	mm	UL 94 HB
Burning behavior test passed	<b>3.0</b>	mm	UL 94 HB
Burning behavior test passed	<b>2.0</b>	mm	UL 94 V-0
Burning behavior test passed	<b>2.4</b>	mm	UL 94 V-0
Burning behavior test passed	<b>3.2</b>	mm	UL 94 V-0
Burning behavior test passed	<b>4.0</b>	mm	UL 94 V-0

Other properties	dry / cond	Unit	Test Standard
Density (lasersintered)	<b>1060 / -</b>	kg/m <sup>3</sup>	EOS Method
Powder colour (ac. to safety data sheet)	<b>White</b>	-	-
Colour of the components	<b>White</b>	-	-

### Characteristics

#### Processing

3D Printing, Additive Manufacturing, Laser Sintering, Rapid Prototyping

#### Delivery form

Powder

#### Additives

Flame retarding agent

#### Special Characteristics

Flame retardant

#### Features

High Crystallinity, Thermal Stability, Homopolymer

#### Chemical Resistance

General Chemical Resistance, Grease Resistance, Oil Resistance

#### Applications

Aircraft and Aerospace, Electrical and Electronical