

# Nylon Family Proposal

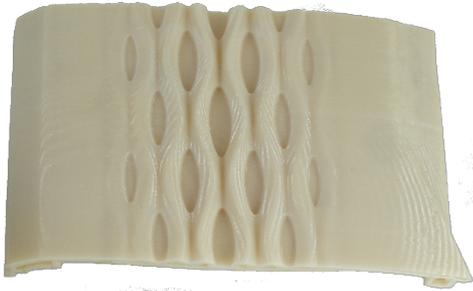
Prepared for Aleph Objects

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Dec 2018



# Nylon Family Overview



**N600**

Nylon 6



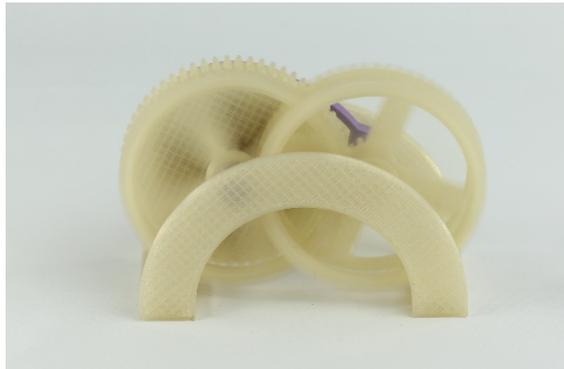
**N600GF20**

Glass Fiber Reinforced Nylon 6



**N600CF20**

Carbon Fiber Reinforced Nylon 6



**N703CB**

Copolymer of Nylon 6/66



**N712**

Nylon 12

# Nylon Family Overview

Material	Description	Stiffness / Modulus	Strength	Impact Resistance / Toughness	Heat Resistance	Chemical Resistance	Features
N703CB	Polyamide copolymer based filament combining excellent heat resistance, mechanical properties and printability	Medium	High	High	High	Medium – High	<ul style="list-style-type: none"> <li>The optimal printing temperature (250 – 260 °C) are compatible with most of printers on the market</li> </ul>
N712	Polyamide-12 (PA12) based 3D printing filament	Medium	High	High	High	High	<ul style="list-style-type: none"> <li>Less sensitivity to moisture</li> </ul>
N600	Polyamide-6 (PA6) based 3D printing filament with excellent mechanical and thermal properties.	High	High	High	High	Medium – High	<ul style="list-style-type: none"> <li>Excellent mechanical and thermal properties</li> <li>Cost-effective</li> </ul>
N600GF25	Polyamide-6 (PA6) based 3D printing filament reinforced by glass fiber	High	High	Very high	Very High	Medium – High	<ul style="list-style-type: none"> <li>Glass fiber reinforced, further improved toughness and dimensional stability</li> <li>Cost-effective</li> </ul>
N600CF20	Polyamide-6 (PA6) based 3D printing filament reinforced by carbon fiber	Very High	High	High	Very High	Medium – High	<ul style="list-style-type: none"> <li>Carbon fiber reinforced, further improved stiffness and dimensional stability</li> <li>Excellent heat resistance</li> </ul>

# Key Features



## Warp-Free™

Minimal warping with no size & geometry limits



## Excellent Printability

No heated chamber required; compatible with most FDM/FFF printers



## Excellent Mechanical Properties

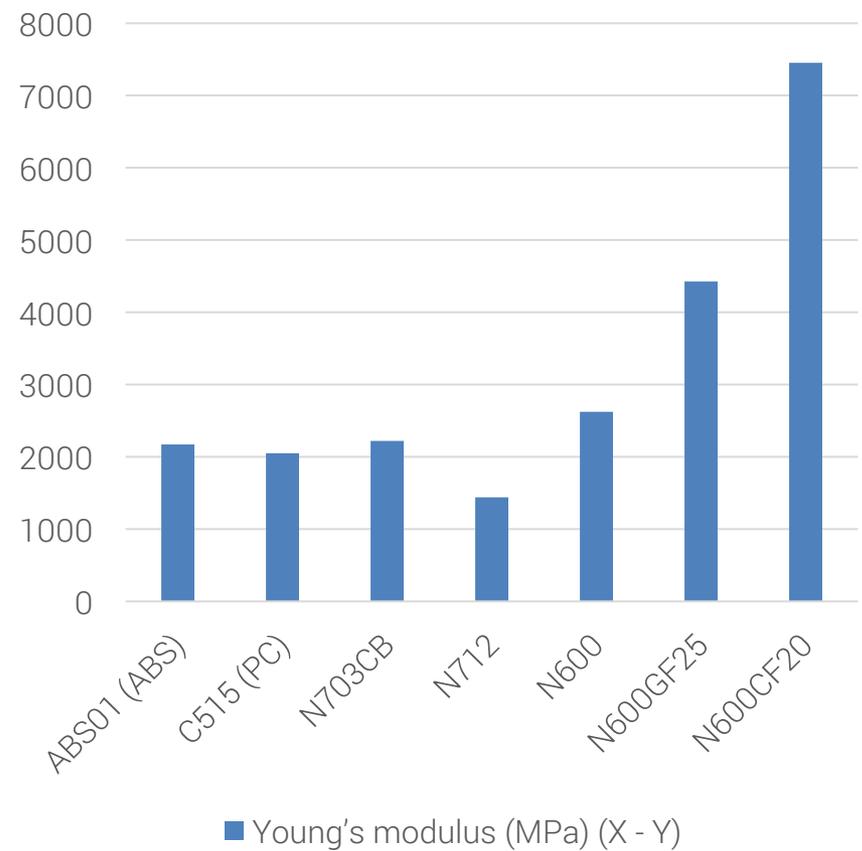
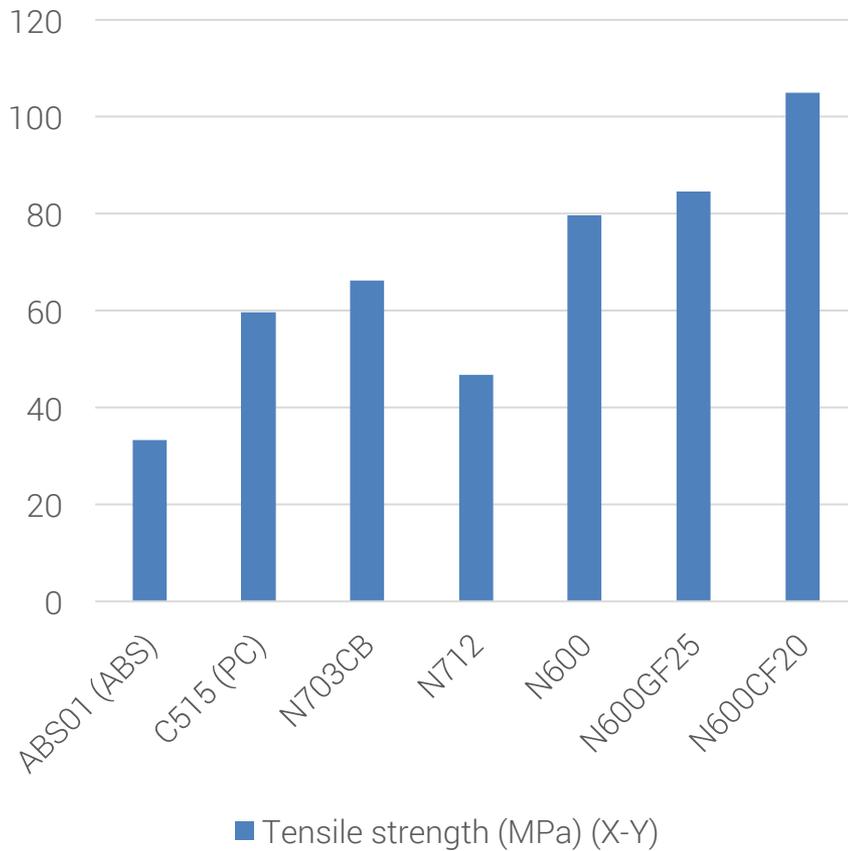
Good strength & toughness with minimal anisotropy



## Excellent Heat Resistance

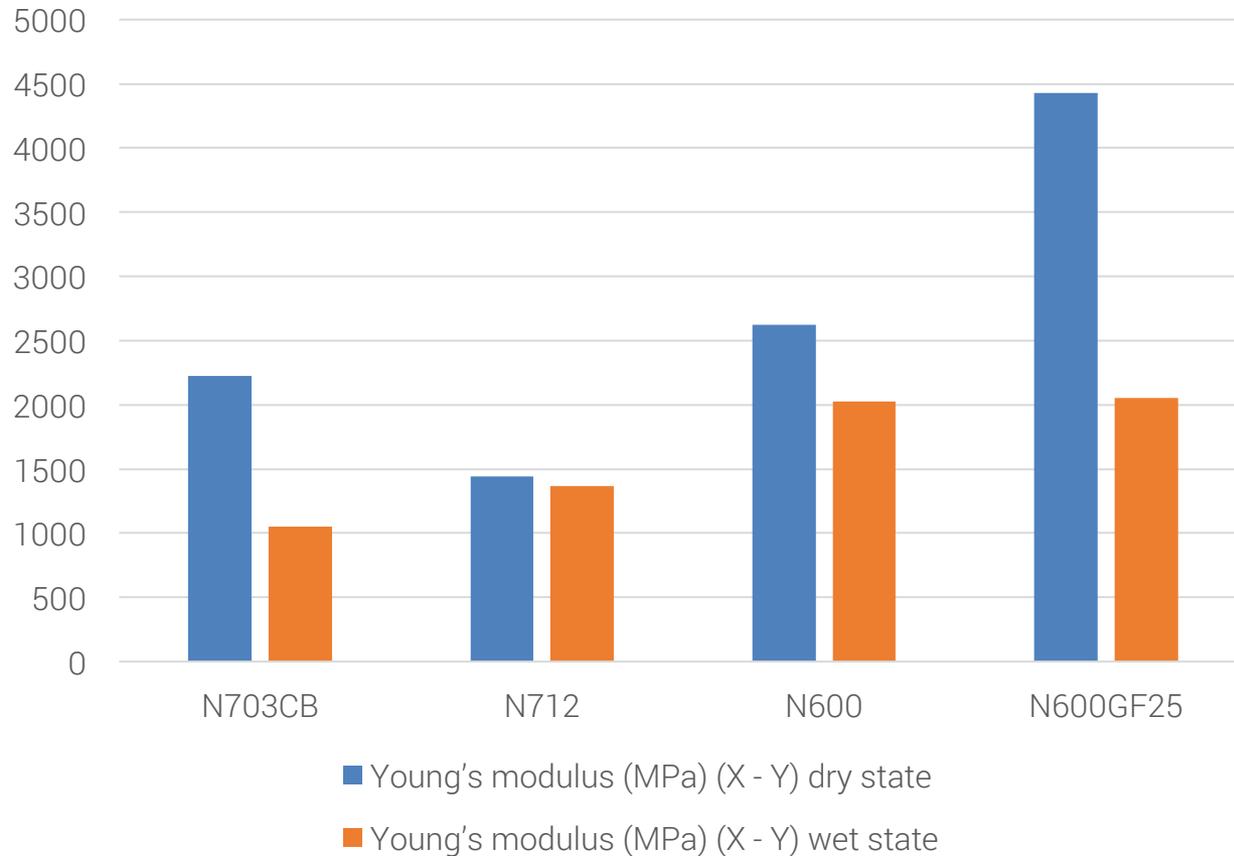
Can resist temperatures up from 150 to 200 °C

# Mechanical Properties



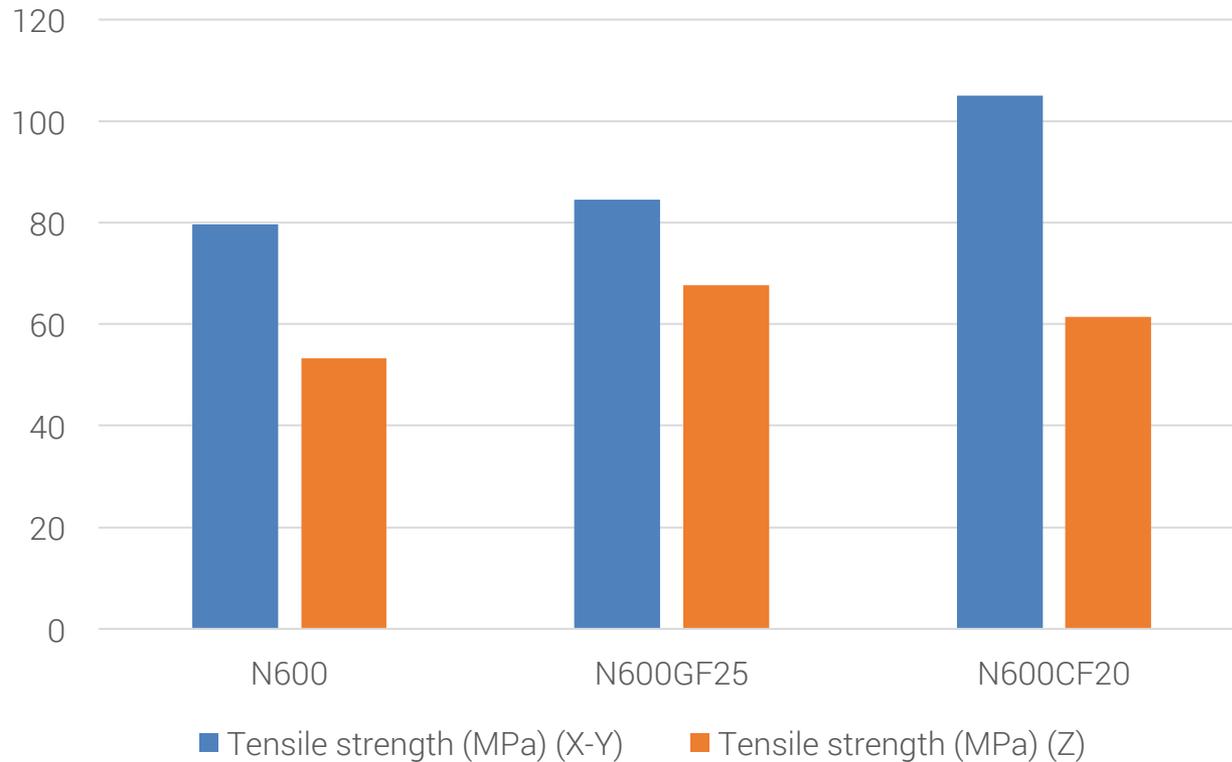
The mechanical properties of N703CB, N600, N600GF25 and N600CF20 are better than both ABS & PC

# Mechanical Properties



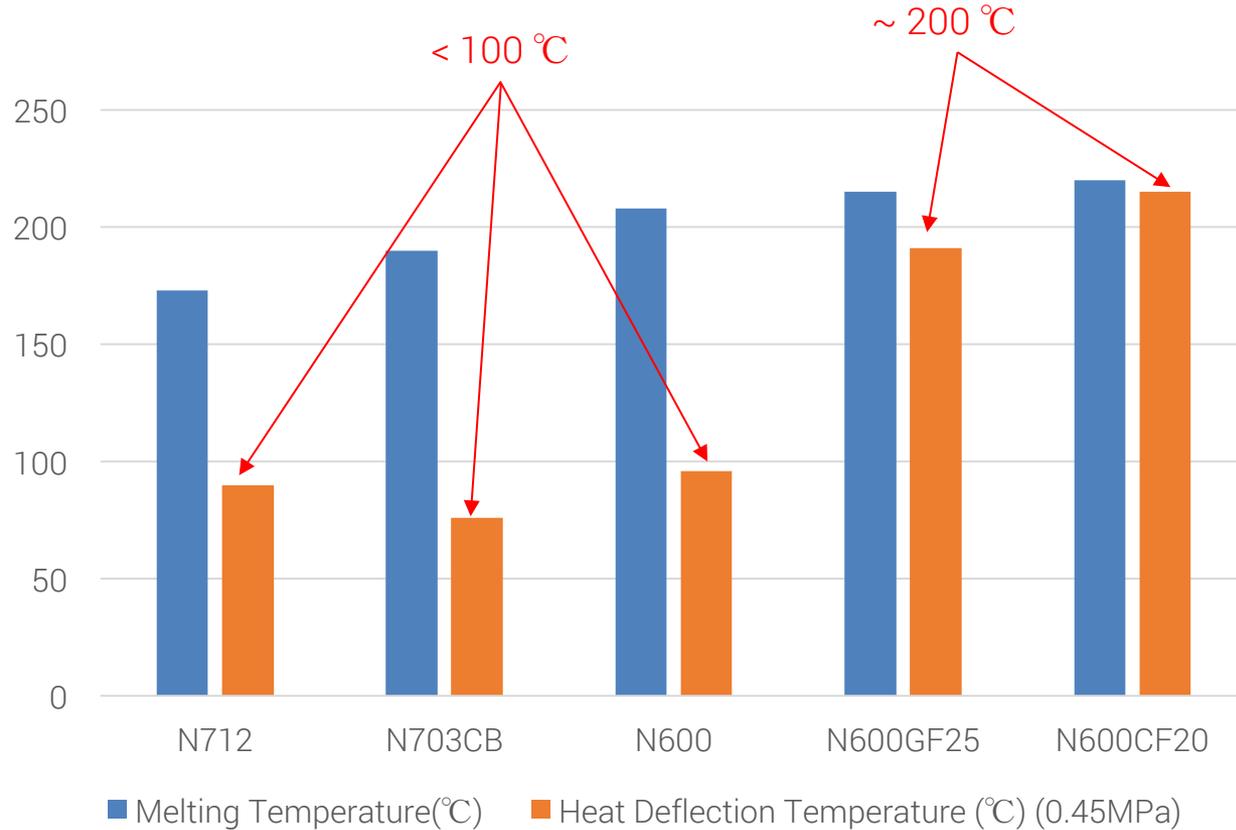
N712 is least sensitive to moisture

# Mechanical Properties



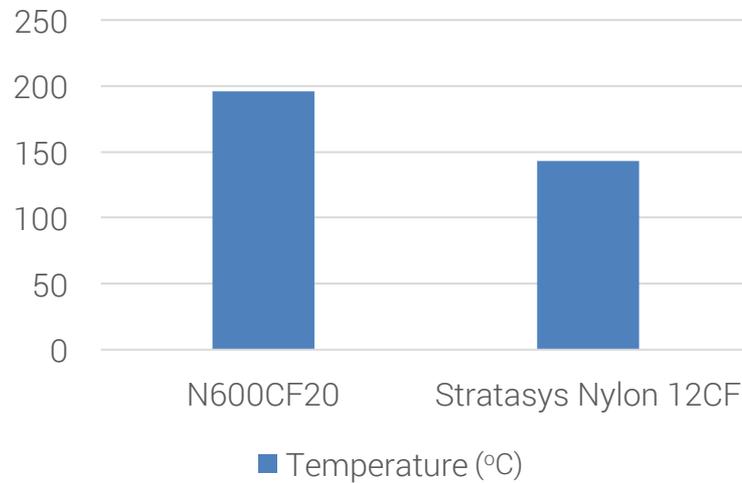
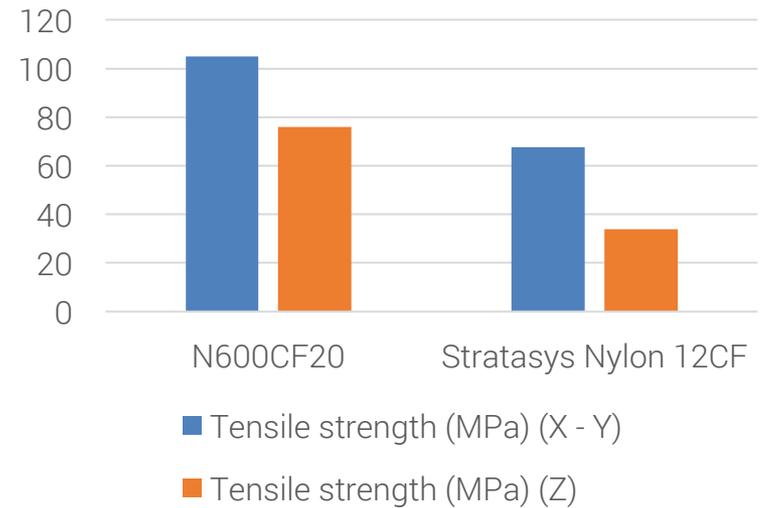
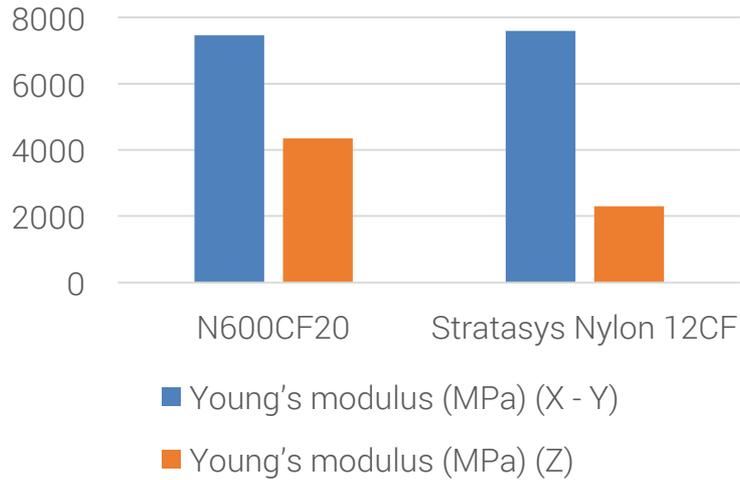
Excellent retention of mechanical properties in Z-direction  
(especially for fiber reinforced materials, with Z-axis strength higher than neat/unreinforced materials)

# Thermal Property



Fiber reinforcement increases the HDT significantly

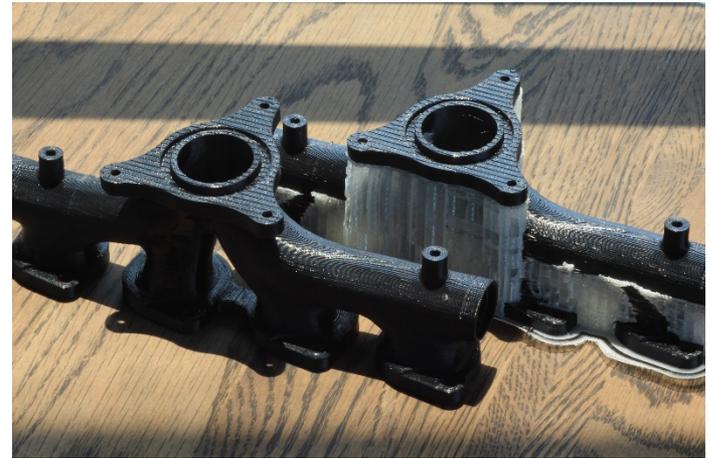
# Comparison to Stratasys Nylon 12CF



N600CF20 outperforms Stratasys Nylon 12CF in both mechanical properties & heat resistance

# Support Material for Nylon Family

**SU301** Water – dissolvable material compatible with N703CB, N600, N600GF25 and N600CF20



**S02N** Alcohol – dissolvable material compatible with N712



# Application Cases: Air Intake NSX



## Customer

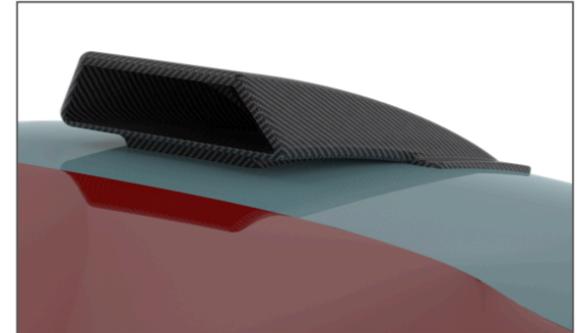
Custom Import Arts

## Use Case

They use N703CB to make the air intake for racing car - NSX

## Benefits

- Customization with lower cost
- Excellent mechanical and thermal properties of N703CB help resist the air pressure and heat from the engine



# Application Cases: Eco-Car



## Customer

Zeal car team of Tongji University

## Use Case

The use of N600 & N600-GF materials for the structural parts of their "Eco-Car"

## Benefits

- The printing of large parts enabled by Polymaker's Warp-Free™ technology
- Excellent balance between mechanical properties and weight reduction



Fuel Consumption: 1 L/100 km!

# Application Cases: XEV



## Customer

XEV

## Use Case

The use of the N600 family of filaments to mass produce the auto body parts for LSEV

## Benefits

- The printing of large parts enabled by Polymaker's Warp-Free™ technology
- Excellent balance between mechanical properties and cost



# N600 Family of Filaments: Printing Considerations

- Nylon family is intrinsically hygroscopic – it is essentially to keep the material dry;
- Wear-resistant nozzles (e.g. The Olsson Ruby) are recommended for N600GF20 & N600CF20.



Thanks!

