Resin material selector guide

for toothbrushes

EASTMAN

Looking for the right resin for your toothbrushes? Don't worry. At Eastman, we cut our teeth on molding innovation and polymer expertise and have a broad BPA-free portfolio to help you differentiate your brand.

Making a daily routine a little more green

Eastman offers an array of plastic solutions for toothbrushes that deliver the clarity and aesthetic appeal, design flexibility, resistance to toothpaste and mouthwash, and processing ease that brand owners expect. In addition, we offer sustainable options for brands looking to reduce their carbon footprint and/or target environmentally conscious consumers. Whatever your needs are, we have you covered.

Our Eastman oral care portfolio for toothbrushes includes:

- **Eastar™ BR003 copolyester,** our best-selling plastic resin for toothbrushes. Eastar BR003 has the versatility to work in simple and complex toothbrushes alike, giving brands the ability to differentiate with intricate designs for premium products. For manufacturers, Eastar BR003 processes faster, easier, and with less energy than competing resins.
- **Eastar™ BR303 copolyester,** a tough, brilliantly clear polymer that works best in simple to moderately complex toothbrush designs. Its high strength allows it to form thinner handles that can endure repeated brushing cycles without breakage.
- **Eastar™ BR403 copolyester,** a water-clear polymer for simple and thick toothbrush handles. It is formulated specifically to resist hazing (also known as crystallizing) that is common for thicker, injection molded parts.
- **Eastar™ EN076 copolyester,** which works best in the simplest of toothbrush designs, including single-use toothbrushes. It is not recommended for complex or thick handle designs.

Our sustainable oral care portfolio for toothbrushes includes:

- **Eastar™ Renew BR003 copolyester,** which takes our best-selling Eastar BR003 copolyester to a whole new level. With 30% or more certified recycled content* powered by Eastman's Advanced Circular Recycling technologies, Eastar Renew BR003 enables brands to reduce their consumption of fossil-based feedstocks, meet their corporate sustainability targets, and have marketable sustainability claims that resonate with consumers. Best of all, it comes with no trade-off in appearance or physical properties.
- **Eastman Trēva™ engineering bioplastic,** a sustainable resin for toothbrushes with more than 40% USDA-certified biobased content sourced from sustainably harvested softwood trees and cotton. With an eco-friendly, clear appearance, it is an excellent choice for brands looking to appeal to environmentally conscious consumers. Trēva is recommended for simple toothbrush designs.

A new landscape of possibilities

Eastman offers sustainable options that can help oral care brands meet or exceed their sustainability targets and—more importantly—give their consumers a very appealing reason to buy. Our resins made from recycled content and cellulosic, biobased products empower forward-thinking toothbrush brands to reduce their environmental impact and carbon footprint. Best yet, these materials don't compromise on aesthetics, performance, or safety—giving both environmentally conscious consumers and product designers a reason to smile.

**According to mass balance accounting, the recycled content of Eastman Renew products has earned International Sustainability and Carbon Certification (ISCC)—a third-party global certification system that addresses sustainability requirements for all feedstocks and markets.*

Which Eastman solution is right for you?

	Appearance	Recommended for				Physical and processing properties			Certified sustainable content
		Simple designs (uniform dimensions, rectangular, and single-shot)	Complex designs (nonuniform dimensions, contoured, and/or multi-shot)	Thick handles and necks (≥ 5 mm thickness)	Thin handles and necks (<5 mm thickness)	Resistance to toothpastes and mouthwashes	Processing ease and speed	Energy efficiency (preprocessing and processing)	
Eastar BR003 Top-of-the-line resin for complex and simple toothbrush designs alike; available with certified recycled content	100% clear, glasslike, premium appearance	✓	✓	✓	✓	●●●	●●●	●●●	**≥ 30%** certified recycled content[a] available with Renew
Eastar BR303 Clear, durable resin for simple to moderately complex toothbrush designs		✓		✓	✓	●●	●●	●●	**Not available presently**
Eastar BR403 Excellent for simple and thick-handled toothbrush designs		✓		✓		●	●●	●●	
Eastar EN076 For the simplest toothbrush designs, including single-use toothbrushes		✓			✓	●	●	●	**≥ 30%** certified recycled content[a] available with Renew
Trēva TR6021 Natural Sustainable resin for toothbrushes with an excellent eco-friendly story	Clear, eco-friendly appearance; warm, wood-like feel	✓		✓		●●	●●	●●	**≥40%** USDA-certified biobased

[a]ISCC certified using mass balance allocation

● = Good ●● = Better ●●● = Best

Material and processing data

	Eastar/Eastar Renew BR003	Eastar BR303	Eastar BR403	Eastar/Eastar Renew EN076	Trēva[a]
Flexural modulus (ASTM D790), MPa (psi)	2,000 (2.9 x 10^5)	1,800 (2.6 x 10^5)	2,060 (3.0 x 10^5)	2,350 (3.4 x 10^5)	1,879 (2.7 x 10^5)
Rockwell hardness (ASTM D785), R scale	103	105	108	111	100
Izod impact strength, notched (ASTM D256), J/m					
@ 23°C	80	No break	105	67	193
@ –40°C	40	79	40	33	88
Haze, %	0.3	1.0	0.2	0.8	NA
Total transmittance, %	91	92	90	89	NA
Recommended drying temperature, °C (°F)	70 (160)	71 (163)	70 (160)	150 (302)	71 (160)
Recommended drying time, hr	3	6	6	4–6	4
Processing melt temperature, °C (°F)	230–280 (450–530)	249–271 (480–520)	249–271 (480–520)	277–293 (530–560)	240–255 (464–490)
Recommended mold temperature, °C (°F)	15–30 (60–80)	16–38 (60–100)	16–38 (60–100)	16–32 (60–90)	71–83 (160–180)
Crystallization half time, min	33	52	2,500	4.5	NA

[a]*Contact us to discuss the specific grade that is right for your application. These properties are representative of the overall brand; actual properties may vary.*

See the benefits of Eastman's sustainable solutions by ordering a free sample to trial.

For more information, visit Eastman.com/OralCare.

EASTMAN
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