



tribrid™

by **PPG**

Marketing Overview

PPG - Fortune 500 company specializing in coatings & specialty materials. 2015 revenues \$15 B

PPG Optical Materials: 70 year history in optical materials with a history of innovation. Introduced the first plastic lens (CR-39® 1950); 1st plastic photochromic lens (Transitions® 1991), Trivex® (2001) unique combination of clarity, comfort, strength and protection

Tribrid™ Material

- Best attributes of High Index with the comfort, strength and durability similar to Trivex material
- Customer benefits
 - Clear, Light, Strong & Thin – No Compromises
 - 1.60 index - thinner lens than Trivex for higher prescriptions
- ECP/Practice benefits – Unique customer benefits that can differentiate ECP practices vs other retailers
- Lab benefits – Processes Easily
 - Standard high index processing – no special wheels or tooling required
 - Easy to edge, drill, groove and mount- Fewer chip and crack defects on drilling and frame flex vs polycarbonate and other 1.60 and 1.67 lenses
 - Can be backside spin coated
 - Improved scratch resistance

PPG's Key Innovations in Optical

Introduced CR-39® monomer more than 70 years ago as the first commercial plastic lens to replace glass



Transitions Optical, Inc. revolutionized the industry with the first plastic photochromic lenses in 1991 using PPG photochromic dye technology



Hi-Gard® coatings, introduced in 1998, provide superior abrasion resistance for all plastic lenses



In 2001, PPG launched a new category of corrective lens materials: Trivex® material provides the unique combination of superior optical quality, lightweight comfort, strength and protection



Tribrid™ material introduced in 2012 as a high index extension of *Trivex* material family to address patient needs for thinner lenses



Introducing Tribrid lenses

With this latest generation lens material technology PPG has joined the *elegance of thin* with the *power of Trivex[®] material* ...

clear > light > strong > thin

For patients with stronger prescriptions, this *hybrid material* combines the best attribute of High Index with the comfort, strength and durability of *Trivex* material

A Stronger Lens for Stronger Prescriptions

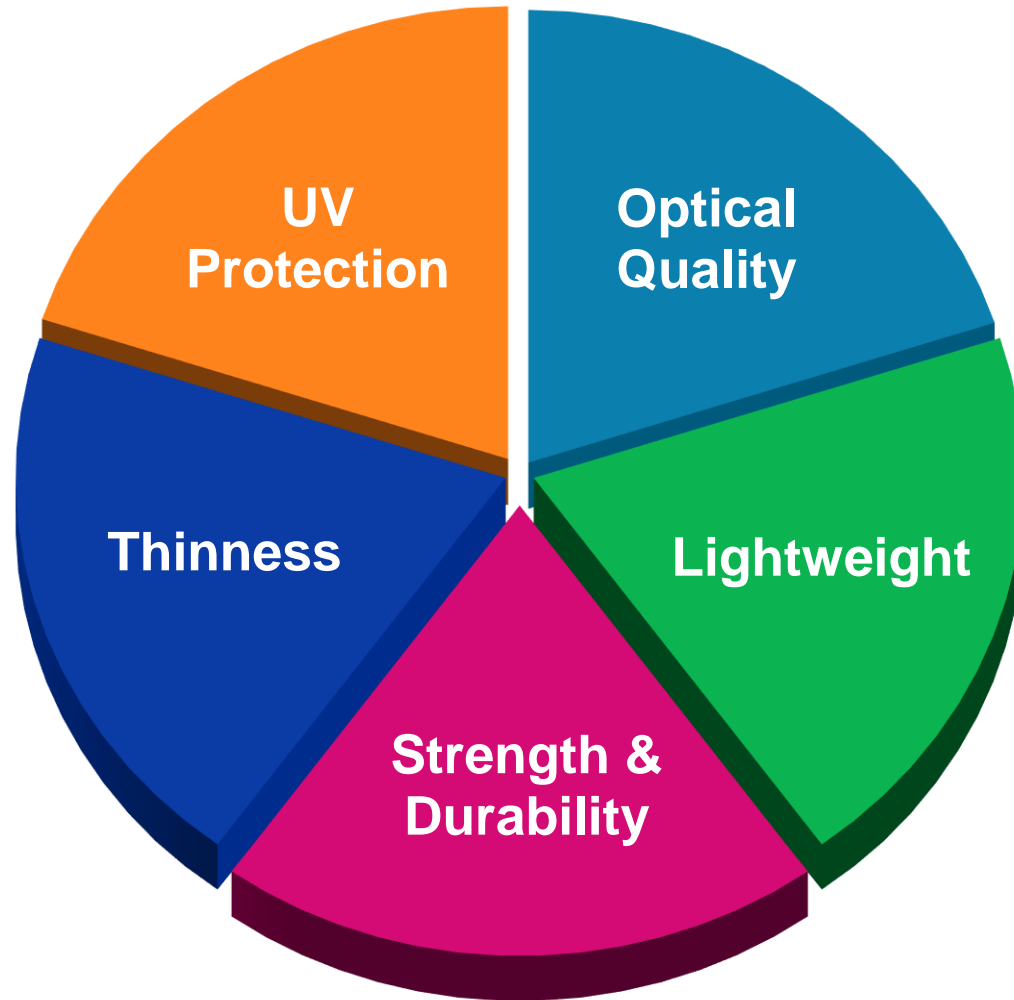
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Five Key Lens Performance Features Influenced by Lens Material Properties

Consider the lens material as the *foundation* of the lens



Tribrid Product Segmentation

- **Recommended Rx range:**
 - *Tribrid*: **-3 to -7 D** and **+3 to +7 D**
- **Target Users:**
 - Current Polycarbonate wearers who want a thin lens but would benefit from improved optics/clarity
 - Current High Index 1.60, 1.67 and 1.74 wearers with moderate to high prescriptions that would benefit from improved optics/clarity and durability
 - Recommended customer lifestyle segments:
 - Active Lifestyles
 - Presbyopes
 - Grooved, rimless, semi-rimless frame buyers

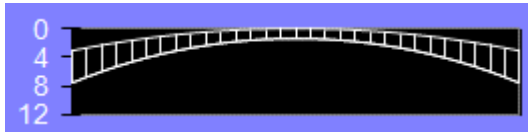
Lens Property Comparison

	Other Materials						
	Tribrid™	Trivex®	Poly-carbonate	Hi-Index 1.60 (MR-8)	Hi-Index 1.67 (MR-10)	Hi-Index 1.74 (MR-174)	Standard Plastic 1.50 (CR-39®)
CLEAR Abbe Value	41	45	30	41	31	33	58
LIGHT Specific Gravity (g/cm ³)	1.23	1.11	1.20	1.30	1.36	1.47	1.31
STRONG FDA Drop Ball	Pass	Pass	Pass	Pass	Pass	Pass	Pass
STRONG Gardner Impact (in-lb force)	250	>700	>700	53	56	~50	31
THIN Refractive Index	1.60	1.53	1.59	1.60	1.67	1.74	1.49
UV Protection (UVA / UVB)	100%	100%	100%	100%	100%	100%	<100%

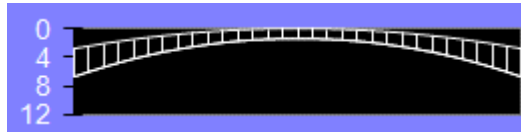
Thin & Light

- **Tribrid™ Material Refractive Index: 1.60**
- Very small difference in thinness between all high index materials for 3-7 diopter

Lens comparison: -4.00 D



Tribrid material (1.60)
Center Thickness: 1.2 mm
Edge thickness: 4.5 mm
Weight: 9.7 g
Abbe: 41



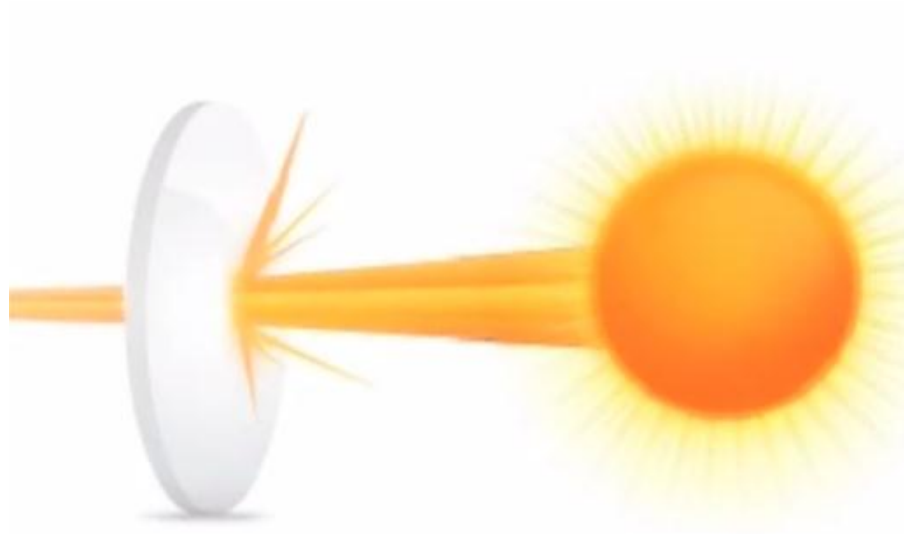
1.67
Center Thickness: 1.2 mm
Edge thickness: 4.1 mm
Weight: 10.0 g
Abbe: 31

Less than 0.5 mm difference in lens edge thickness, which is less than half the thickness of a credit card!



100% UV Protection

Contributes to overall eye health and safety by providing
100% UVA-UVB protection



Processing Tribrid™ lenses – Rx Lab and ECP Benefits

- **Compatible with existing equipment and settings – drop in to existing processes**
 - Surfacing – Runs on existing high index settings
 - Edging – Runs on existing high index settings
 - Anti-Reflective – Excellent compatibility with most major vacuum deposition coatings as well as “sputter” based coatings
- **Excellent Hard Coat Performance**– Tribrid lens material has excellent adhesion
 - Compatible with backside spin coatings and dip coatings
- **Superior Chemical Resistance** - resistant to cracking, crazing from common lab and household chemicals (e.g. Isopropyl Alcohol, Caustic, Acetone)
- **Outperforms other 1.60 and 1.67 products in rimless frame configurations (COLTS lateral bridge stress frame test)**
 - Fewer chip and crack defects on drilling
 - Fewer chip and crack defects on frame flexure
 - Less stretching out of temples after testing



Positioning Tribrid vs. other materials

Positioned vs....	Tribrid benefits vs. alternatives
Polycarbonate	<ul style="list-style-type: none">• Clearer (41 vs 30 Abbe)• Similar lightweight comfort• More resistant to chemicals• Better performance in drill mounts
Existing 1.60 materials	<ul style="list-style-type: none">• 7% Lighter• 5x Stronger• Quick turnaround – can be backside spin coated
Existing 1.67 materials	<ul style="list-style-type: none">• Clearer (41 vs 33 Abbe)• 10% lighter• 5x stronger• Less than 0.5mm (half a credit card) thickness difference• Quick turnaround – can be backside spin coated



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