

3M Science.
Applied to Life.™



Make bright the standard


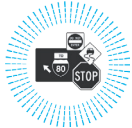






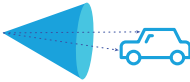
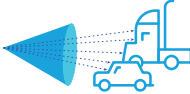


Upgrade to Type XI reflective sheeting

Why upgrade to 3M™ Diamond Grade™ DG³ Sheeting?

Brighter signs, safer roads. You can make a difference during the day, and especially at night, by using 3M™ Diamond™ Grade DG³ Reflective Sheeting to make signage brighter and more visible, giving drivers more time to react. Let's compare.

Prismatic sheeting that meets ASTM D4956 Type IX performance standard is commonly made using truncated cube corner technology.

3M™ Diamond Grade™ Reflective Sheeting (DG³) meets ASTM D4956 Type XI. This highly reflective sheeting uses 100% efficient full-cube prismatic technology that reflects almost twice the amount of light back to its source as Type IX reflective sheeting.

	3M™ Truncated Cube Corner Tech		3M™ Diamond Grade™ DG ³	
	Type IX		Type XI	
Luminance		Intermediate Luminance		Maximum luminance Returns nearly twice the amount of light as Type IX with 100% efficiency
Specification and standards		Mid to High performance standards Meets ASTM D4956 Type IX		Highest performance standards Meets ASTM D4956 Type XI
Technology developed		1990s		2000s
Sight distance		Performs best at Short distances		Optimized for all distances
Retroreflective efficiency		Intermediate Retroreflection 32% Retroreflection efficiency		Highest Retroreflection 58% Retroreflection efficiency optimized for large and small vehicles
Retroreflective technology		Truncated cube technology Reflects more light than glass-bead technology found in some engineer grade sheeting		Full cube technology Reflects more light than truncated cube corner and glass-bead technology found in lower-grade sheeting



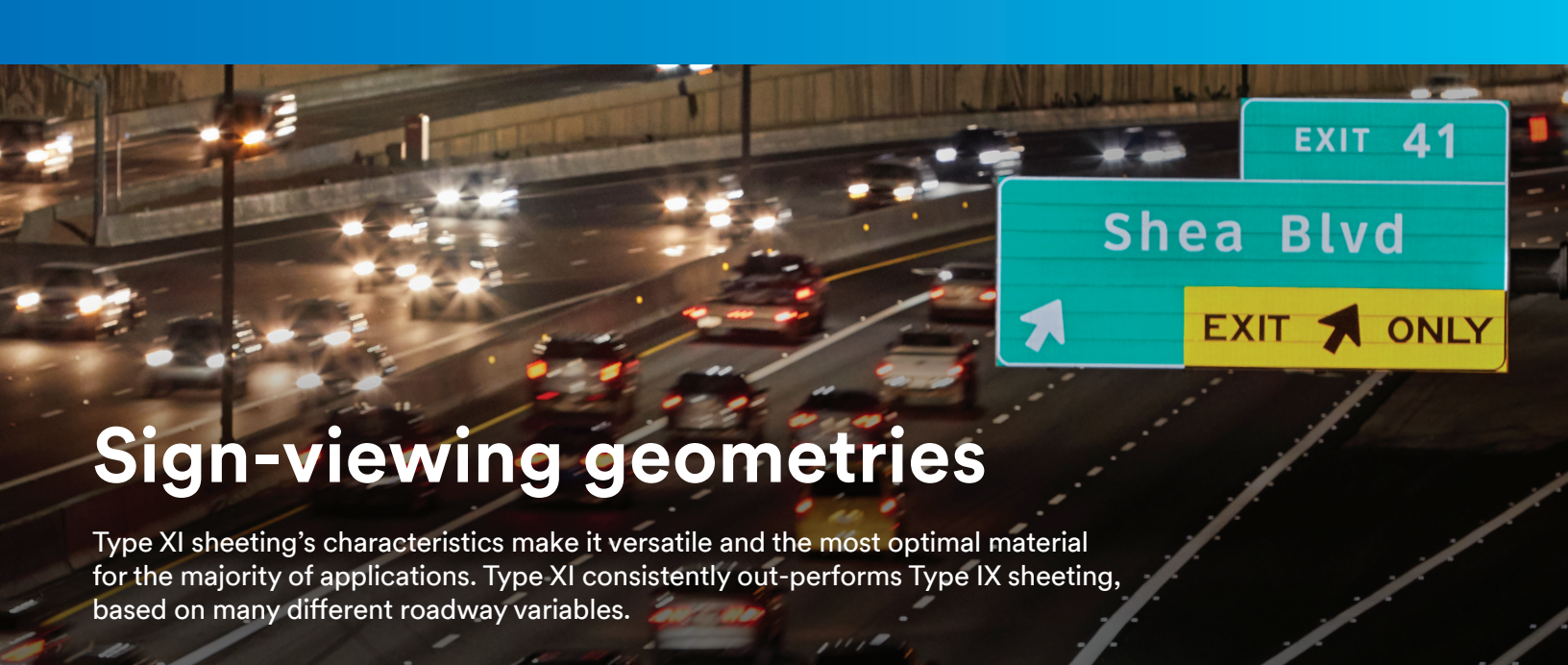
Don't get "accidentally downgraded"

Many traffic sign fabricators already use Type XI sheeting, even when road authorities' specifications might only call for Type IX. That's why those who are committed to achieving the highest possible traffic safety outcomes know that the technology in 3M™ Diamond Grade™ Sheeting provides solutions to help make roadways safer.



Make bright the standard

Upgrade your specification to type XI by using 3M™ Diamond Grade™ Sheeting to deliver bright visible signs that will help provide the best driving experience for all drivers on the road. Signs will remain bright with lasting durability, in both urban and rural areas.



Sign-viewing geometries

Type XI sheeting’s characteristics make it versatile and the most optimal material for the majority of applications. Type XI consistently out-performs Type IX sheeting, based on many different roadway variables.

ASTM-4956 Specification Table for Types I, III, IV, IX and XI

Obs./Ent. Angles	Type I	Type III	Type IV	Type IX	Type XI
0.2 / -4	70	250	360	380	580
0.2 / 30	30	150	170	215	220
0.5 / -4	30	95	150	240	420
0.5 / 30	15	65	72	135	150
1.0 / -4	N/A*	N/A*	N/A*	80	120
1.0 / 30	N/A*	N/A*	N/A*	45	45

* Values at these angles are not included in ASTM-4956 for these types.
Highlighted values represent the most common sign viewing geometries.
Luminance is a better measure of on-road performance of installed signs.
cd/ft² (cd-lx-1-m-2)

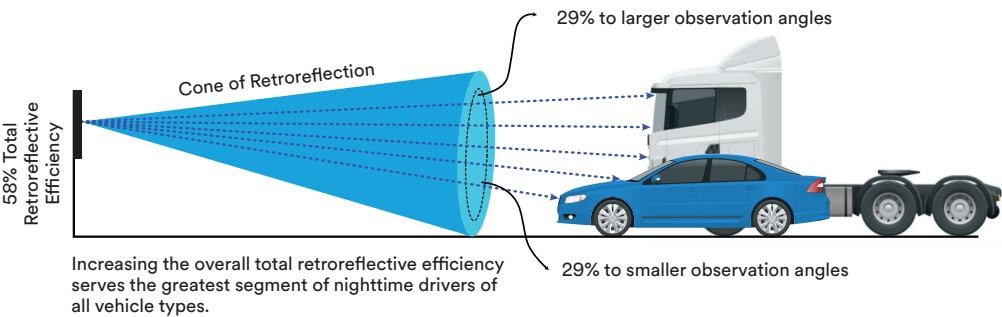
A study done by the University of Iowa showed that a 50% reduction in sign brightness required an additional 20% reading time, on average, to achieve the same response accuracy level, meaning less bright signs actually require a longer reaction time.¹

Boost road sign visibility with 3M™ Diamond Grade™ DG³ Sheeting.

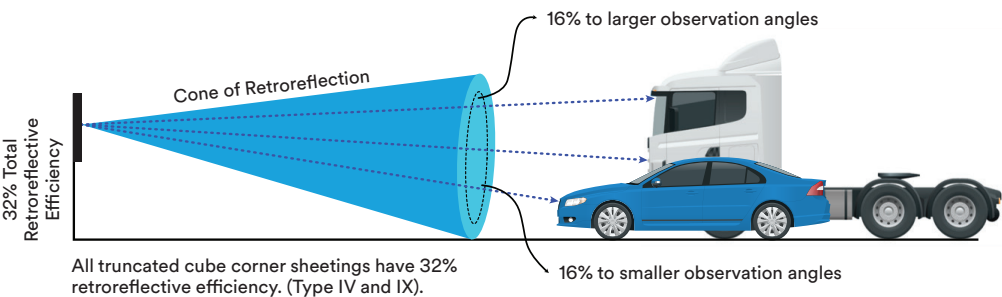
3M™ Type XI Sheeting reflects more light, increases sign visibility at greater distances to give more reaction time for drivers of all vehicle types.

¹Schell T, Yekshatyan I., Daiker R., Konz J., Effects of Luminance on Information Acquisition Time and Accuracy from Traffic Signs. Journal of Transportation Research Board, 2008. UIWOA

3M™ Diamond Grade™ DG³ Sheeting– Type XI



3M™ Truncated Cubed Corner Tech – IV & IX

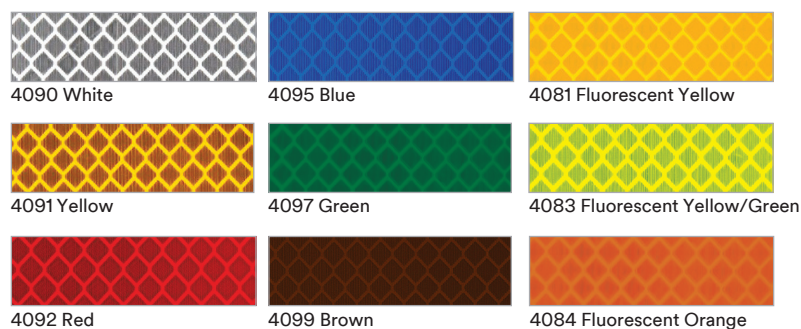


Maximum total reflected light

3M™ Diamond Grade™ DG³ Reflective Sheeting Series 4000

Achieve superior reflectivity at short and long distances with 3M full-cube technology.

- ▶ Meets the highest overall retroreflectivity requirements in global industry standards: ASTM D4956 Type XI
- ▶ Our best solution for signs positioned inside and outside of primary headlight illumination
- ▶ One of the brightest durable sheetings
- ▶ Performance warranted for up to 12 years



Guidance you can count on

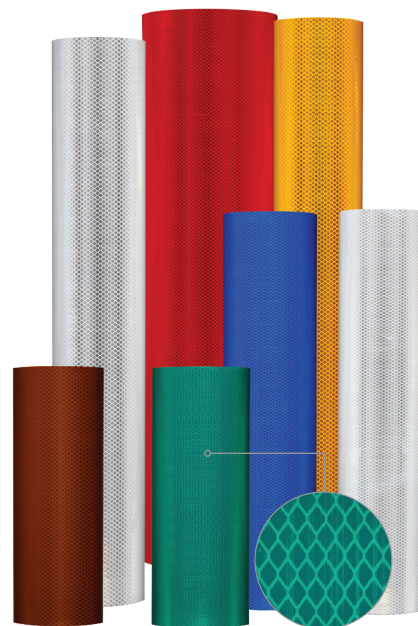
Most efficient polycarbonate full-cube technology

Returns almost 2X more light*

Broad observation angles

Polycarbonate, stable prismatic optics

*vs. traditional sheeting



Type IX Prevents Access to Innovation



Infrared 2D codes imbedded within a roadway sign that can be read by both the human eye and machine vision

New technologies being developed to enable machine readability of road signs are based on Type XI sheeting, as it offers the best balance of properties for all road users.

See [3M.ca/ConnectedRoads](https://www.3m.ca/ConnectedRoads) for more detail.



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