

Glass designation :

PHOTOBROWN EXTRA™ Code **8122**

Color : Clear to medium brown
 Glass type : Photochromic crown glass.
 Application : Ophthalmic lenses : Single vision, G&P progressive addition.

PHYSICAL PROPERTIES

Density :	2.41	g/cm3
Linear Exp. Coef. :	63.5	10 ⁻⁷ / °C
Viscosity :	Soft. Pt	665 °C
	Ann. Pt	495 °C
	Strain Pt	465 °C

REFRACTIVE INDEX

Line		λ (nm)	Value
F'	Cadmium	480.0	1.52999
F	Hydrogen	486.1	1.52944
e	Mercury	546.1	1.52523
d	Helium	587.6	1.52300
C'	Cadmium	643.8	1.52064
C	Hydrogen	656.3	1.52016
Abbe Number		ve	56.2
		vd	56.4

TRANSMISSION PROPERTIES (2 mm)

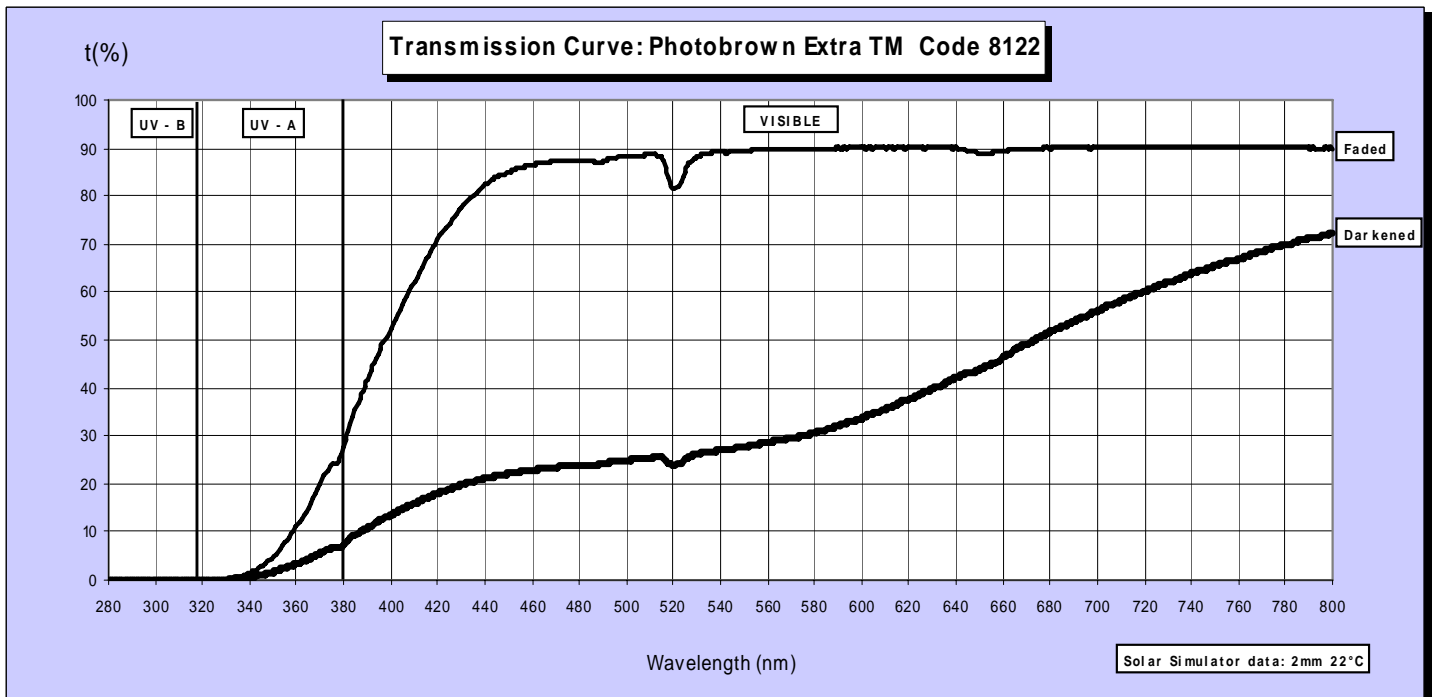
VISIBLE 380 - 780 nm	Faded	Darkened
Luminous transmission factor	89.0%	29.0%
ULTRAVIOLET		
t(max) 280 - 315 nm	<0.1	<0.1
t(avg) 280 - 315 nm	<0.1	<0.1
Solar UV-B transmission factor	<0.1	<0.1
t(max) 315 - 350 nm	5.0%	1.5%
t(moy) 315 - 380 nm	8.5%	2.5%
Solar UV-A transmission factor	6.0%	2.0%
BLUE LIGHT 380 - 500 nm		
Blue light transmission factor	81.5%	21.5%
TRAFFIC SIGNAL RECOGNITION		
ISO 14889	Pass	
ANSI Z80-3	Pass	
AS 1067.1	Pass	

COATING & TEMPERING
 (See also notes below)

Vacuum coating	YES
Chemical tempering	YES
Air tempering	YES

CHEMICAL DURABILITY (class)

To water	NF ISO 719	HGB3
To acid	DIN 12-116	3
To alkalis	ISO 695	A2



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Note :
 Heat treatments as indicated below, or vacuum coatings, may cause changes in transmission and color properties.

Chemtempering :	Recommended bath and cycle			
Bath :	Potassium Nitrate	59.5%	Time :	16 Hr
	Sodium Nitrate	40.0%	θ °C :	400 °C
	Silicic acid	0.5%		

Air tempering :
 Use standard schedule for photochromic crown glass.

Compatible Bariums :
 This glass has not been designed for fused multifocal production nor heat formed aspheric or progressive lenses

Heat forming :
 For purpose of manufacturing the above type of lenses, select
Code 8123 FUS. PHOTOBROWN EXTRA™

Transmittance properties according to ISO 8980-3

Photochromic response :

Temperature			2 mm thickness
22 °C	Heat faded	Tv (0)	89.0%
	15 mn darkened	Tv (15)	29.0%
	5 mn faded		62.0%
	Night driving conditions ⁽¹⁾		83.5%
5 °C	15 mn darkened	Tv (15)	22.5%
35 °C	15 mn darkened	Tv (15)	45.0%

⁽¹⁾ Reference : ISO 8980-3 Chapter 6.5

Transmission categories :

	2 mm
Faded state	Category 0
Darkened state	Category 2
Night driving ⁽²⁾	Yes

⁽²⁾ Reference : ISO 14889 Chapter 4.5

Properties according to ISO 14889

ISO 14889 Chapter 4.3.1

Physiological compatibility

The above glass products are not known to be physiologically incompatible, nor known to create a significant number of allergic reactions, when the lenses made out of these materials are used as intended by the manufacturer

ISO 14889 Chapter 4.3.2

Flammability

The above glass products are not flammable, and when tested as described in chapter 5.1 of ISO 14889, there is no continued combustion after withdrawal of the test rod.