

Glass designation : **PHOTOGRAY THIN & DARK™** Code **8157**

Color : **Clear to Dark gray**  
 Glass type : **Wide range photochromic glass for thin lenses application (2mm).**  
 Application : **Ophthalmic lenses : Single vision, G&P progressive addition.**

**PHYSICAL PROPERTIES**

Density : 2.38 g/cm<sup>3</sup>  
 Linear Exp. Coef. : 62.2 10<sup>-7</sup>/°C  
 Viscosity : Soft. Pt 634 °C  
                   Ann. Pt 493 °C  
                   Strain Pt 463 °C

**REFRACTIVE INDEX**

Line		λ (nm)	Value
F'	Cadmium	480.0	1.52989
F	Hydrogen	486.1	1.52938
e	Mercury	546.1	1.52518
d	Helium	587.6	1.52300
C'	Cadmium	643.8	1.52063
C	Hydrogen	656.3	1.52021
Abbe Number		ve	56.7
		vd	57.0

**TRANSMISSION PROPERTIES (2 mm)**

VISIBLE 380 - 780 nm  
 Luminous transmission factor Faded 91.0% Darkened 14.0%

**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 10.0% 1,0%  
 t(moy) 315 - 380 nm 13.0% 1.5%  
 Solar UV-A transmission factor 9.5% 1.0%

BLUE LIGHT 380 - 500 nm  
 Blue light transmission factor 86.5% 14.0%

**TRAFFIC SIGNAL RECOGNITION**

ISO 14889 Pass  
 ANSI Z80-3 Pass  
 AS 1067.1 Pass

**USE for DRIVING**

**Caution :** Photogray Thin&Dark™ meets ISO Standard 14889 for use when driving up to and including 5,5 mm center thickness.

Thin and Dark lenses with a center thickness greater than 5,5mm are **notrecommended** because they may become too dark for daytime driving. Photogray Thin&Dark™ in thicker plus power lenses may be too dark at freezing temperature for **driving open vehicules** such as snowmobile and motorcycles.

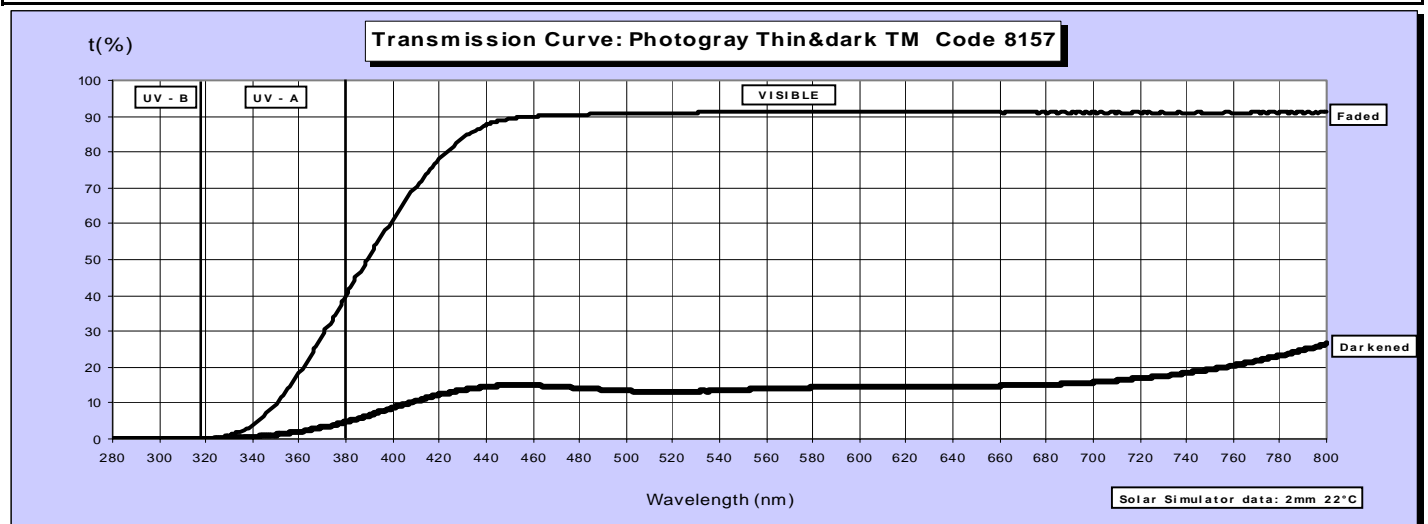
**COATING & TEMPERING**

(See also notes below)

Vacuum coating YES  
 Chemical tempering YES  
 Air tempering NO

**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 (no preheating nor postcooling) :

<b>Bath :</b>	Potassium Nitrate	<b>99.5 %</b>	(Sodium nitrate 0,5% max)	Time :	<b>2 Hr</b>
	Silicic Acid	<b>0.5 %</b>		θ °C :	<b>450 °C</b>
 <b>Or :</b>	Potassium Nitrate	<b>59.5%</b>		Time :	<b>16 Hr</b>
	Sodium Nitrate	<b>40%</b>		θ °C :	<b>400 °C</b>
	Silicic acid	<b>0.5%</b>			

**Air tempering :**

This glass shall not be air tempered

**Compatible Bariums :**

This glass can not be used to manufacture fused multifocal lenses nor heat formed progressive.  
 For purpose of manufacturing the above type of lenses refer to **Code 8158 Photogray Thin&Dark™ FUS**

**Transmittance properties according to ISO 8980-3**

**Photochromic response :**

Temperature			2 mm thickness
<b>22 °C</b>	Heat faded	Tv (0)	<b>91.0%</b>
	15 mn darkened	Tv (15)	<b>14.0%</b>
	5 mn faded		<b>41.0%</b>
	Night driving conditions <sup>(1)</sup>		<b>82.0%</b>
<b>5 °C</b>	15 mn darkened	Tv (15)	<b>10.0%</b>
<b>35 °C</b>	15 mn darkened	Tv (15)	<b>26.0%</b>

<sup>(1)</sup> Reference : ISO 8980 Chapter 6.5

**Transmission categories :**

	2 mm
Faded state	<b>Category 0</b>
Darkened state	<b>Category 3</b>
Night driving <sup>(2)</sup>	<b>Yes</b>

<sup>(2)</sup> Reference : ISO 14889 Chapter 4.5