

Glass designation :

**XDF DARK GRAY** Code **8135**

Color : **Gray**  
 Glass type : **Medium to dark.**  
 Application : **Pretinted 45% photochromic glass suited for general or special purpose Tinted Glasses. Neutral gray with excellent color rendition. Pass cited standards for traffic signal recognition at 2 mm thickness. Blanks for corrective lenses available on request.**

**PHYSICAL PROPERTIES**

Density :	<b>2.41</b>	<b>g/cm3</b>
Linear Exp. Coef. : ( $\alpha$ +20/+300°C)	<b>65</b>	<b>10<sup>-7</sup>/°C</b>
Viscosity : Soft. Pt	<b>665</b>	<b>°C</b>
Ann. Pt	<b>495</b>	<b>°C</b>
Strain Pt	<b>465</b>	<b>°C</b>

**REFRACTIVE INDEX**

Line		$\lambda$ (nm)	Value
F'	Cadmium	480.0	1.52992
F	Hydrogen	486.1	1.52933
e	Mercury	546.1	1.52518
d	Helium	587.6	1.52300
C'	Cadmium	643.8	1.52064
C	Hydrogen	656.3	1.52017
Abbe Number		ve	56.6
		vd	57.0

**TRANSMISSION PROPERTIES (2 mm)**

<b>VISIBLE 380 - 780 nm</b>	<b>Faded</b>	<b>Darkened</b>
Luminous transmission factor	<b>44.0%</b>	<b>15.5%</b>
<b>ULTRAVIOLET</b>		
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	3.0%	1.0%
t(avg) 315 - 380 nm	7.0%	2.0%
Solar UV-A transmission factor	4.5%	1.5%
<b>BLUE LIGHT 380 - 500 nm</b>		
Blue light transmission factor	45.0%	16.0%
<b>TRAFFIC SIGNAL RECOGNITION</b>		
ISO 14889	<b>Pass</b>	
ANSI Z80-3	<b>Pass</b>	
AS 1067.1	<b>Pass</b>	
<b>CAUTION :</b>		
<i>Lens thicknesses greater than 2.5 mm transmit less than the 8% visible transmission required for driving</i>		

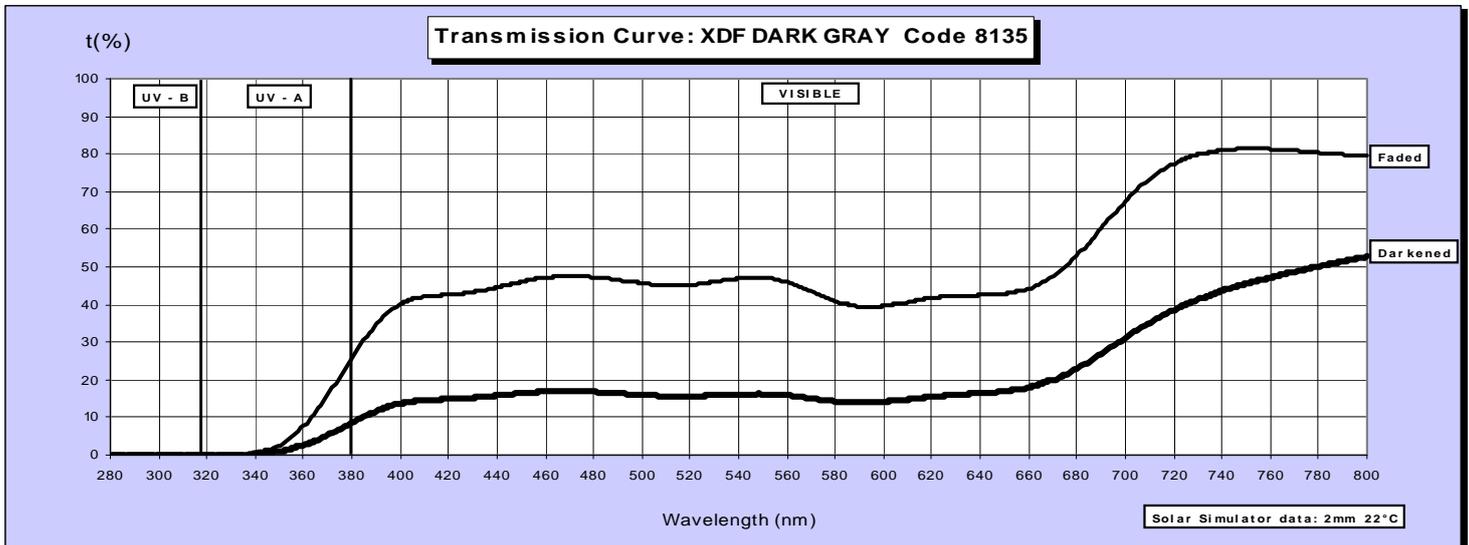
**COATING & TEMPERING**

(See also notes below)

Vacuum coating	<b>YES</b>
Chemical tempering	<b>YES</b>
Air tempering	<b>YES</b>

**CHEMICAL DURABILITY (class)**

To water	<b>NF ISO 719</b>
To acid	<b>DIN 12-116</b>
To alkalis	<b>ISO 695</b>



Glass designation :	<b>XDF DARK GRAY</b>	Code	<b>8135</b>
Color :	<b>Gray</b>		
Glass type :	<b>Medium to dark.</b>		
Application :	<b>Pretinted 45% photochromic glass suited for general or special purpose Tinted glasses. Neutral gray with excellent color rendition. Pass cited standards for traffic signal recognition at 2 mm thickness. Blanks for corrective lenses available on request.</b>		

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

Chemtempering :		Recommended bath and cycle			
<b>Bath :</b>	Potassium Nitrate	<b>59.5%</b>	Time :	<b>16 Hr</b>	<b>2 Hr</b>
	Sodium Nitrate	<b>40.0%</b>	T °C :	<b>400 °C</b>	<b>450 °C</b>
	Silicic acid	<b>0.5%</b>			

**Air tempering :**  
Use standard schedule for photochromic crown glass. Minimum lens thickness for normal air tempered is 2 mm.

**Compatible Bariums :**  
This glass has not been designed for fused multifocal production.  
There is no compatible barium to be fused with this glass.

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

**Photochromic response :**

Temperature			2 mm thickness
<b>22 °C</b>	Heat faded	Tv (0)	<b>44.0%</b>
	15 mn darkened	Tv (15)	<b>15.5%</b>
	5 mn faded		<b>30.0%</b>
	Night driving conditions <sup>(1)</sup>		<b>40.0%</b>
<b>5 °C</b>	15 mn darkened	Tv (15)	<b>12.0%</b>
<b>35 °C</b>	15 mn darkened	Tv (15)	<b>22.0%</b>

<sup>(1)</sup> Reference : ISO 8980-3 Chapter 6.5

**Transmission categories :**

	2 mm
Faded state	<b>Category 1</b>
Darkened state	<b>Category 3</b>
Night driving <sup>(2)</sup>	<b>No</b>

<sup>(2)</sup> 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.