

Observation Room Windows

Observation room windows provide psychologists, physicians and scientists with a chance to observe patients or subjects undetected, and thus to provide better treatment or to advance research. This memo explains how glass for observation windows may be selected.

"One-way vision" can be achieved by maintaining an adequate subject/observer lighting level ratio (SOR), with clear glass or even without any glazing material. Harold Horowitz, NSF, suggests 10-15% transmittance glass with $SOR = 10/1$ (subject 100 footcandles/observer 10 footcandles). To see clearly, yet remain undetected, observation room surfaces should be flat black, light sources must be carefully shielded, and observer must wear dark clothing.

Horowitz says, "under these lighting conditions, transparent glazing materials of all degrees of light transmission will appear to be mirrors when viewed from the bright subject side."

Low transmittance glass such as GRAYLITE®, SOLARCOOL®, SOLARGRAY®, SOLARBRONZE®, and OPTIGRAY 23™ glasses enhance one-way performance by increasing "effective lighting ratio" (ELR) and by reducing subject room light on the observer (see Table I). According to Horowitz, the ELR should be at least 60 when low transmittance glasses are selected. Higher ELR values may be needed with clear glass.

Example:

Calculate maximum glass transmittance which will provide an $ELR = 60$ when subject room level is 100 FTc and observation room level is 5 FTc:

$$ELR = \frac{\text{Subject room lighting level (footcandles)}}{\text{Observation room lighting level (footcandles)}} \times \frac{100}{Tv}$$

(Tv is glass transmittance)

$$60 = \frac{100}{5} \times \frac{100}{Tv}$$

$$Tv = \frac{100 \times 100}{5 \times 60} = 33$$

From Table I, Column 1, select GRAYLITE 31 ($Tv = 31$) or any other glass with Tv of 33 or less.

Reference: "Observation Room Windows", by Harold Horowitz, American Psychologist, March 1969, Vol. 24, No. 3

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EFFECTIVE LIGHTING RATIOS

TABLE I. EFFECTIVE LIGHTING RATIO (ELR) OF Vitro (formerly PPG) ARCHITECTURAL GLASS PRODUCTS WHEN USED FOR "ONE WAY" WINDOW APPLICATIONS

		SOR	SOR	SOR	SOR	SOR
		1	5	10	20	100
<u>Vitro PRODUCT</u>						
<u>SINGLE</u>	<u>T_v</u>					
CLEAR FLOAT	89	1	6	9	18	89
SOLEX	75	1	7	13	27	133
GRAYLITE "31"	31	3	16	32	65	323
GRAYLITE "14"	14	7	36	71	143	714
SOLARBRONZE	50	2	10	20	40	200
SOLARGRAY	41	2	12	24	49	244
Gray	18	6	28	56	111	556
Bronze	21	5	24	48	95	476

$$\text{SOR} = \frac{\text{Subject Room Lighting Level (Ftc)}}{\text{Observation Room Lighting Level (FTc)}}$$

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HISTORY TABLE		
ITEM	DATE	DESCRIPTION
Original Publication	2/1/1975	
Revision #1	1/15/2002	Transferred to TD-116
Revision #2	2016-10-04	Updated to Vitro Logo and format

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