

Optical Materials for Precision Molding

Product Information

SCHOTT offers various optical glasses specifically developed for precision molding – the so called low T_g glasses. Low T_g glasses have a glass transformation temperature suitable for precision molding and a special glass composition to decrease the tendency for devitrification and to reduce the reaction with mold materials within the molding temperature range.

During a precision molding process, a polished or fire polished preform is shaped into a final geometry, while conserving its surface quality. The typical temperature range for the molding process is between 500 °C and 700 °C, enabling the extension of the operating lifetime of the mold material and a significant time reduction of the press process.



Advantages

- Low transformation temperatures, most below 550 °C, to increase lifetime of molds and to reduce process time
- Low tendency to chemical interaction between glass constituents and mold materials within the molding temperature range
- Tight optical tolerance
- Wide range of dimensions
- Various forms of supply
- Application support from SCHOTT
- Continuous extension of the portfolio ⇒ new glass types in development

Forms of Supply

- Optical glass rods* in various shapes and surface qualities, diameter <1–12.5 mm, length up to 1000 mm
- Ball lenses* in different formats
- Other supply forms on request

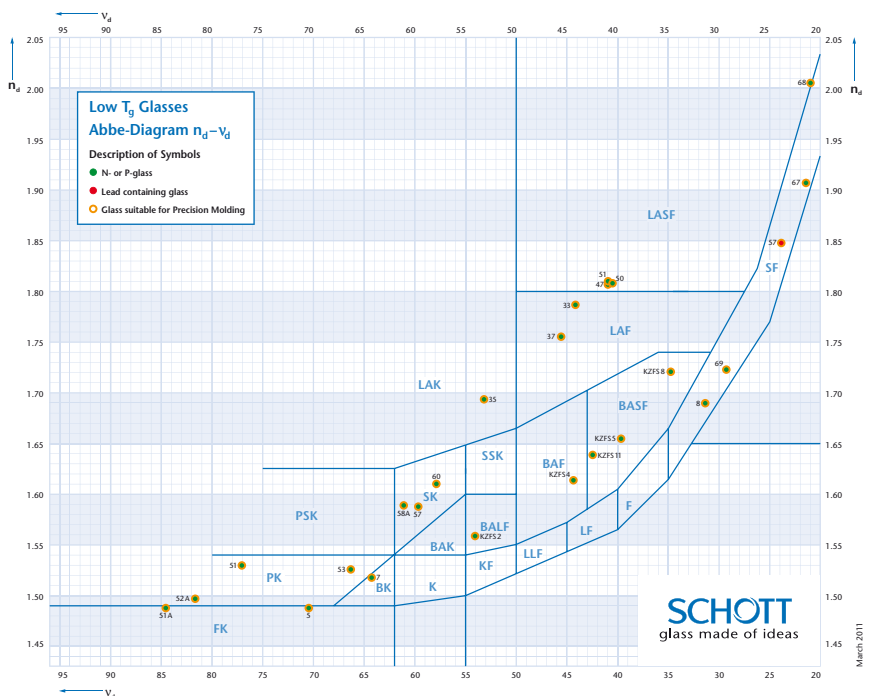
* individual product flyers available

Applications

Precision molding is the state-of-the-art-technology for the volume production of complex lenses, e.g. aspheres, for various applications such as:

- Digital Projection
- Digital Cameras
- Camcorders
- Microscopy
- Industrial Applications

Materials SCHOTT Low T_g Glass



Glass Type**	Optical Properties			n _d ref. ²	After molding ³		Thermal Properties		Chemical Res.		Physical Properties			
	n _d ¹	v _d ¹	Color code		n _d	v _d	T _g [°C]	AT [°C]	SR-J ⁵ Acid Res.	WR-J ⁵ Water Res.	CTE [10 ⁻⁶ K ⁻¹] ⁶	Hardness (HK)	Abrasion Aa ⁵	Density [g/cm ³]
N-FK51A	1,48656	84,47	34/28	1,48597	1,4847	84,2	464	503	3	1	14,8	345	528	3,68
N-FK5	1,48749	70,41	30/27	1,48666	1,4850	70,2	466	557	5	4	10,0	520	109	2,45
N-PK52A	1,49700	81,61	34/28	1,49640	1,4952	81,3	467	520	4	1	15,0	355	526	3,70
P-BK7	1,51640	64,06	33/30	1,51576	1,5144 ⁴	63,9 ⁴	498	546	1	4	7,3	627	66	2,43
P-PK53 ⁱ	1,52690	66,22	36/31	1,52567	1,5232	66,0	383	418	3	1	16,0	335	977	2,83
N-PK51	1,52855	76,98	34/29	1,52784	1,5267	76,7	487	528	3	1	14,1	415	592	3,86
N-KZFS2	1,55836	54,01	34/30	1,55666	1,5531 ⁴	53,6 ⁴	472	533	6	6	5,4	490	70	2,54
P-SK57Q1	1,58600	59,60	34/31	1,58496	1,5833	59,4	439	522	4	1	8,9	535	124	3,01
P-SK57	1,58700	59,60	34/31	1,58596	1,5843	59,4	493	522	4	1	8,9	535	124	3,01
P-SK58A	1,58913	61,15	35/31	1,58795	1,5860	60,8	510	551	4	2	8,4	662	102	2,97
P-SK60	1,61035	57,90	33/29	1,60918	1,6068	57,7	507	547	4	3	8,9	601	86	3,08
N-KZFS4	1,61336	44,49	36/32	1,61227	1,6100 ⁴	44,5 ⁴	536	597	6	4	8,2	520	130	3,00
N-KZFS11	1,63775	42,41	36/30	1,63658	1,6341 ⁴	42,3 ⁴	551	–	–	–	7,6	530	74	3,20
N-KZFS5	1,65412	39,70	37/32	1,65272	1,6498 ⁴	39,8 ⁴	584	648	1	1	7,4	555	122	3,04
P-SF8	1,68893	31,25	40/36	1,68623	1,6814	31,7	524	580	1	1	11,1	533	200	2,90
P-LAK35	1,69350	53,20	36/29	1,69234	1,6904	53,0	508	544	4	3	9,7	616	119	3,85
N-KZFS8	1,72047	34,70	38/33	1,71896	1,7158 ⁴	34,8 ⁴	509	561	1	1	9,4	570	152	3,20
P-SF69 ⁴	1,72250	29,20	40/36	1,72006	1,7150 ⁴	29,6 ⁴	508	547	1	1	11,1	612	–	2,93
P-LAF37 ⁴	1,75550	45,60	37/31	1,75396	1,7507 ⁴	45,6 ⁴	506	546	4	1	7,8	697	67	3,99
N-LAF33	1,78582	44,05	39/32	1,78425	1,7813	43,9	600	628	6	1	6,7	730	67	4,36
P-LASF47	1,80610	40,90	39/33	1,80449	1,8016	40,8	530	580	3	1	7,3	620	70	4,54
P-LASF50	1,80860	40,46	39/32	1,80699	1,8036 ⁴	40,3 ⁴	527	571	3 ⁴	1 ⁴	7,3	655	62	4,54
P-LASF51	1,81000	40,93	39/33	1,80842	1,8055	40,8	526	570	3	1	7,4	722	66	4,58
SF57 ^h	1,84666	23,83	40/37*	1,84608	1,8447	23,7	414	449	6	1	9,2	350	344	5,51
P-SF67 ⁱ	1,90680	21,40	48/39*	1,90439	1,8998	21,6	539	601	1	1	7,4	440	309	4,24
P-SF68	2,00520	21,00	49/41*	2,00365	2,0004 ⁴	20,9 ⁴	428	468	4–5	1	9,7	410 ⁴	298	6,19

 New glasses

* Wavelength for transmittance 0.7 and 0.05

** Technical datasheets available at: http://www.schott.com/advanced_optics/downloads/optical_glass

¹ Catalog value (reference annealing rate 2 K/h)

² n_d reference value (annealing rate 25 K/h)

³ As pressed @ SCHOTT, for details please contact SCHOTT.

⁴ Preliminary data

⁵ SR-J, WR-J and Abrasion Aa according to Jogis

⁶ Value between 20–300 °C

^h Also in High Transmission version available, color code 39/36

ⁱ P-PK53 will become inquiry glass as of 2014/01/01, not recommended for new designs

P-SF67 will become inquiry glass as of 2016/01/01, not recommended for new designs

N-glasses: lead & arsenic free

P-glasses: lead & arsenic free Low T_g glasses exclusively developed for precision molding

In case the optical values do not fit exactly to your applications, please get in touch with your local sales office.

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