

## **TNE-04: Test report for delivery lots**

### **0. Test report for delivery lots of optical glass**

With every delivery of optical glass the customer receives a test report in accordance with ISO 10474–2.2 as described in chapter 1.3.1 of the optical glass catalog. The test report contains non-specific test results to confirm the compliance of the delivery with the order. That means that random representative test samples were inspected during production to ensure the compliance with the order. The specific choice of test samples and inspection procedures ensures the validity of results for all parts of the delivery lot even if they were not individually tested.

#### **1. Compilation of delivery lots**

Delivery lots are compiled according to their refractive index and Abbe number specification. The maximum scattering of refractive index within a lot is  $\pm 1 \times 10^{-4}$  (pressings:  $\pm 2 \times 10^{-4}$ ). The maximum scattering tolerance for precision molding glasses is limited by the refractive index tolerance step 3. In general the delivery lot contains adjacent batches taken from a single production run. SCHOTT will add material from other production runs that fit the optical position of the respective delivery lot if the ordered quantity exceeds the quantity of a single production run.

#### **2. Marking of the delivery lot and batches**

The Lot-ID number is assigned automatically by the computer system and is not related to any production information. A new Lot-ID is assigned for each delivery and only related to the delivered lot. The delivery lot contains batches, which are the smallest administrated units of materials. Batches are marked with the production serial number, e.g. C100001234. A batch of block glass for further cold processing contains a single glass block. In the case of processed glass 100 single glass discs could also be one batch.

#### **3. Details in the test report**

The test report as shown on the next page contains the Lot-ID, the order number, the SCHOTT customer number, the glass type, the refractive index and Abbe number steps, the scattering tolerance of refractive index, a list of all batches of the delivery lot, details on the central optical position of the delivery lot between the maximum and the minimum value of refractive index and Abbe number in the lot, the difference of the refractive index and the Abbe number from the catalog values. The spectral internal transmittance at 400 nm and a sample thickness of 10 mm. The color code can be added on special request.

The refractive index and the Abbe number of the d-line are based on measurements. All values of other spectral lines then the d-line are calculated using the relative dispersion values (or using the Sellmeier coefficient) of the glass given in the catalog.

Example of test report (subject to change)

# SCHOTT

Test Report / Werkszeugnis		14.09.2007
ISO 10474-2.2		
Delivery Note / Lot-Id. / Lieferschein / Lieferlos	81566258 000040	14.09.2007
Order Position of / Auftrag Position vom	897069 000020	02.07.2007
Customer / Kunde	5018153	
Glass Type / Glasart	N-BAK4	
$n_d/v_d$ - Step / - Stufe	1 / 1	
Scattering / Streuung	±	0,00010

**Batches / Chargen**

TNA14612 TNA14625 TNA14729 TNA14748 TNA14806 TNA14820

$n_d$	1,56892	0,00009 *	$v_d$	55,98	0,00 *	0,00% *
$n_e$	1,57134	0,00009 *	$v_e$	55,71	0,01 *	0,02% *
			$n_F-n_C$	0,01016		
			$n_d-n_C$	0,00308		
			$n_F-n_d$	0,00708		
			$n_F-n_e$	0,00466		
			$n_g-n_F$	0,00558		
			$n_F-n_{C'}$	0,01026		
			$n_F-n_e$	0,00525		

\* Deviation from catalogue value / Abweichung vom Katalogwert

This test report is printed with EDP. It is valid without signature.  
Dieses Werkszeugnis ist per EDV ausgedruckt und ohne Unterschrift gültig

**SCHOTT AG**  
Mainz, Germany

QFQ001DA

For precision molding glasses we additionally report the glass transformation temperature. The refractive index values given are reference values based on a reference annealing rate of 2 K/h. The actual refractive index of the precision molding glass batches will be different. More information on precision molding glasses can be found in the technical information no. 40.

#### 4. Annealing state of the delivery lot

The described test reports refer to delivery lots of fine annealed glass for cold processing purpose. It is assumed that no additional heat treatment of the glass with temperatures near  $T_g$  will be applied during further processing. In general the delivery lot will not be compiled of glass with homogeneous annealing rate history. Therefore even in the case of correct fine annealing additional heat treatment might lead to greater scattering of refractive index than promised in the test report.

The given limit values for the stress birefringence will be kept even for delivery lots with inhomogeneous history of annealing rates.

Glasses for precision molding in general are coarse annealed glasses. The customer will receive a test report with the refractive index and Abbe number of the delivery lot based on a reference annealing of 2 K/h. The actual refractive index of the glass within this lot will differ from this value.

Delivery lots of glasses for reheat pressing do have homogeneous annealing rates and will be delivered with an annealing schedule as certificate. The certificate contains values of the central refractive index and Abbe number of the lot at a given annealing rate and tolerable annealing rates for different refractive index and Abbe number steps. This information is generated with samples whose state of annealing differs from the respective glass. The glass is only coarse annealed. Delivery lots of glass for reheat pressing are in general not suited for the cold processing of optical components (cutting, grinding, polishing). On special demand lots of fine annealed glass can also be delivered with homogeneous annealing rates and additional annealing schedules.

#### 5. Backtracking of material properties and production information of lots

A batch is numbered directly after melting and coarse annealing. The batch number is kept in all further processing steps and therefore allows to backtrace all important material properties and production information.

We recommend to preserve the batch numbers of glass pieces used for following processing steps. Statements on quality of the delivered glass can only be made with reference to the respective batch numbers.

### 7. Additional test certificates

Further properties of the delivery lot that were requested by the customer will be certified with additional entries within the test report or as additional test certificates.

For more information please contact:

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