

CATALOG REVISIONS

With the increasing demand for strict specifications, the review of needed property items is conducted, in which new indices are added and numeric numbers are reviewed with an improvement in measurement accuracy.

1. 1. Refractive properties

1) Recalculated from the dispersion constant of each glass type and revised are refractive indices for respective wavelengths, partial dispersions, partial dispersion ratios and abnormal dispersions.

2) Addition of partial dispersion

The following partial dispersions are added.

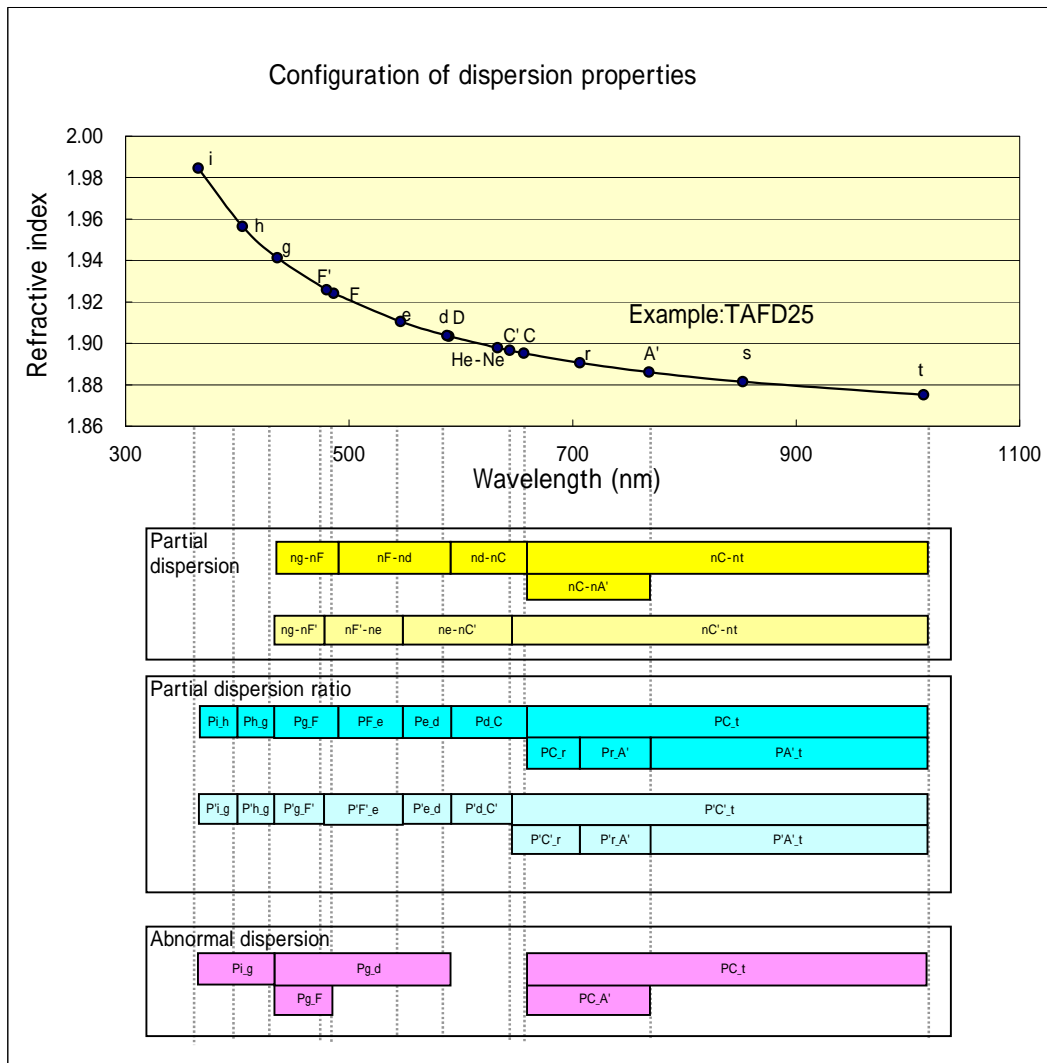
| | |
|--------|--------|
| nC-nt | nC'-nt |
| nC-nA' | |
| nd-nC | ne-nC' |
| nF-nd | nF'-ne |
| ng-nF | ng-nF' |

3) Addition of partial dispersion ratio

The following partial dispersion ratios are added.

| | |
|-----------------|-------------------|
| PC _t | P'C' _t |
|-----------------|-------------------|

The following figure shows the configuration of dispersion properties according to these revisions.

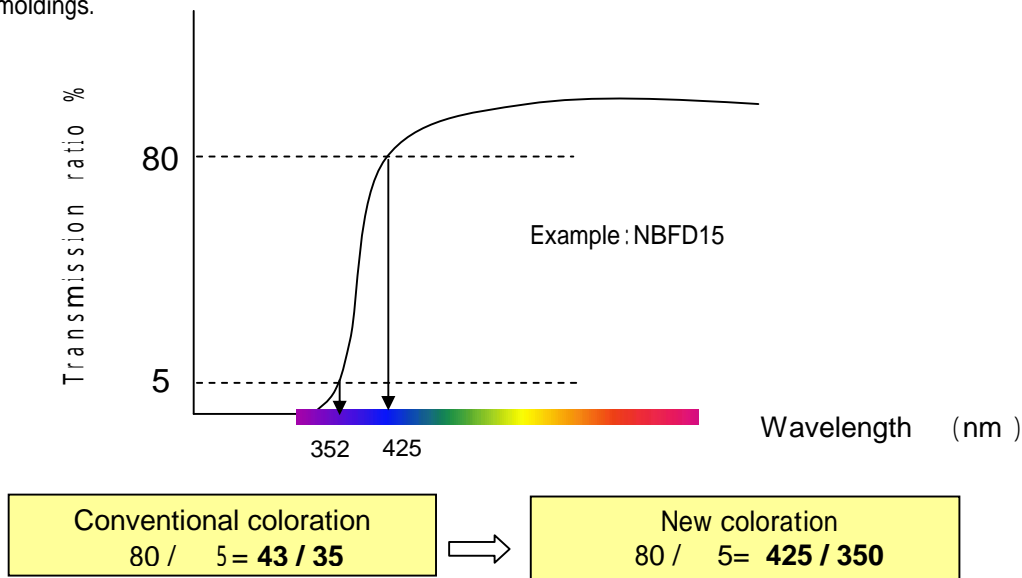


2.2. Optical transmission properties

This catalog revision focuses on the review of optical transmission properties, performing changes and additions.

1) Change of coloration notation

A reference value of coloration was conventionally represented at a pitch of 10 nm with rounding off the first digit of a wavelength of 80, 70 or 5. For example 80 equals to 43 with a glass type having a wavelength of 425nm for 80, which makes the difference of 5nm. The influence given by this difference cannot be ignored with the recent demand for strict specifications. The reference value is therefore changed to at a pitch of 5 nm with rounding up at 3 and down at 2 of the first digit of the wavelength in order to improve the precision of the reference value, about recommended glasses, glass molded lenses and preforms for precision moldings.



2) Update of representative internal transmittance

The representative internal transmittance is reviewed based on the average value of actual transmittance at production over the past year.

3) A reference value is set, which is the internal transmittance of a wavelength with a transmittance of 80 %.

With no transmittance loss due to surface reflection, a transmission status can be represented without the influence of a refractive rate.

4) The coloration tends to be relatively strong at recent glasses having high refractive index.

A new index based on chromaticity is added, which represents the color of glass. (standard optical source: D65) No coloration is represented as x=313, y=330. The coloration increases with distance from this value.

3. Change of chemical properties

A climate resistance is added to glass molded lenses and preforms for precision moldings.

4. Change of thermal properties

1) A thermal expansion property, thermal conductivity, specific heat etc. are reviewed of many glass types with reflecting an improvement in measurement accuracy.

2) The notation for Tg and Ts is changed from a conventional pitch of 5nm (partially 1nm pitch) to a pitch of 1nm.

3) The refractive index is determined by annealing speed after pressing.

The degree of changes in a refractive index due to cooling speed and wavelengths varies depending on glass types.

In this catalog a numeric number (value) showing the change of a refractive index due to cooling speed is added for 4 wavelengths (g, F, d, and C lines), which is inherent for preforms for precision moldings.

About the detail of the above revisions, refer to the attached file: "catalog revisions" showing numeric differences between the new catalog and the previous one.

"-" means unchanged.

Number "2" means that a numeric number in the new catalog is larger by 2 than that in the previous catalog.