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Nippon Electric Glass Co., Ltd.

Optical coating material to realize high contrast for display cover glass **Success in joint development with Tohoku University and University of Washington**

In joint work with a research group led by Professor Hitoshi Takamura of Tohoku University and with the University of Washington in the U.S., Nippon Electric Glass Co., Ltd. (Head Office: Otsu, Shiga, Japan, President: Motoharu Matsumoto) has developed optical coating material for display cover glass that realizes displays with high contrast images and a high quality appearance.

Liquid crystal displays are currently used on devices such as televisions, personal computers, smartphones and in-vehicle monitors. However, the leaking of light from the backlight makes the expression of dark colors difficult and there is an issue regarding how to best obtain high contrast images. The merit of the newly developed material is that it has high and uniform absorption in the wavelengths of visible light (400 nm to 700 nm). By using it as part of the AR (anti-reflection) coating material used to suppress the reflection from external light on the display, it is also possible to absorb the light leaking from the backlight to realize sharp images with rich black colors. It is also possible to express a deeper black color on the black printed part (frame part) around the display cover glass, to realize an external appearance with high quality.

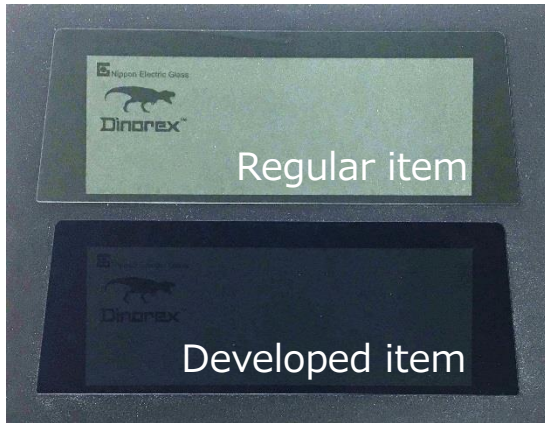
We will accelerate the speed of the development work to aim for a quick startup of mass production and hope to realize display cover glass with higher added value to lead to commercialization.

(History of the development)

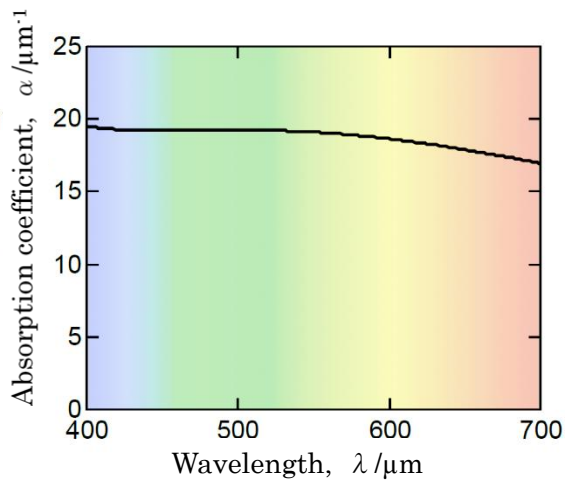
While using the pulsed laser deposition method*¹ to conduct detailed investigations of the optical absorption properties of various thin oxide materials, it is discovered that the compound material ($\text{Nb}_x\text{Ti}_{1-x}\text{O}_2$) made from titanium dioxide - niobium has particularly high and uniform absorption throughout the visible light region. We believed that those characteristics would be effective for the improvement of display color expression and from 2016 we have worked together with Tohoku University and the University of Washington in the U.S. to promote the development of the material.

The details of the developed technology will be published in the international academic journal "Applied Surface Science."

(*1. Pulsed laser deposition method: One method for making coatings with thickness in the order of nanometers (one millionth of one millimeter))



Comparison between the regular item (item without AR coating) and the developed item (item with AR coating using $\text{Nb}_x\text{Ti}_{1-x}\text{O}_2$)



Graph of absorption coefficient of $\text{Nb}_x\text{Ti}_{1-x}\text{O}_2$ coating