The influence of the SiO$_2$ barrier layer on the glass composites laser ablation studies

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The influence of SiO$_2$ barrier layer on the laser ablation destruction threshold energy values of the glass composites with two components oxide films of TiO$_2$–Me$_x$O$_y$ composition studies in the continuing [1–3] works have been fulfilled. The alloying Me$_x$O$_y$ oxide amount was about 2 or 10 mass %. The oxides summary mass content in the film-forming sol was about 5 mass %. A substrate was the M0 type float-glass. The films were drown on the sample at the speed of 3.8 mm/s from the sol.

The film thickness, its refractive index and the film reflection coefficient values have been measured by the spectrum ellipsometer, light transmission in visible range and microhardness experimentally measured too. The composites laser ablation destruction under the irradiation of the pulse laser radiation with time duration of 20 nanoseconds or 300 microseconds was studied by the procedure given in [1, 3]. The threshold energy density dependences on the film thickness and its microhardness values are similar so it is necessary to consider the losses of the laser radiation energy due to the reflection at the films surface.