

Coating equipment for mass production based on langmuir-blodgett technology

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A unique technology and equipment for applying to the surface of films with a thickness of one molecule were developed [1]. Technology features allow making the process of film formation continuous, up to the implementation of the Roll - Roll scheme for flexible products. Meanwhile a defect-free coating is formed from 2 to 100 nm in thickness, depending on the structure of the molecules of the applied material. Depending on the nature of the material, coatings can have various consumer properties, in particular, protective ones with high wear resistance in friction processes (they withstand up to 10,000 cycles of abrasive wear with a hard steel fabric under a load of 10 N / cm²), hydro and oleophobic properties, a very low coefficient of friction, resistance to aggressive environmental influences (acids, alkalis, UV radiation). Accordingly, the range of applications of such coatings is quite wide - from display appliance, photonics to nano and molecular electronics. Examples are easy-to-clean coatings for optics, cover glass for solar cell modules, in ophthalmology, in the construction industry (architectural, low-emission and decorative glass), for ceramics, etc. The low coefficient of friction (0.04) makes such coatings promising in friction units. The developed installation of a conveyor type can easily be integrated into a continuous type technological process, herewith there are no fundamental limitations on the size of the modified area. In particular, equipment for modifying sheet glass of the maximum Jumbo size (6,000 mm x 3210 mm) can be supplied.

Upon the request of the Customer the product line can be additionally equipped with systems for prewash and surface activation of glass, light and heat treatment, loading and unloading devices, etc.

The equipment can be produced to suit the requirements of a specific Customer and will ensure the formation of layers not only on the surface of flat products such as sheet glass, but also on the surfaces of products of complex shape. It is possible to simulate the process using a laboratory version of the installation, see fig. 1.

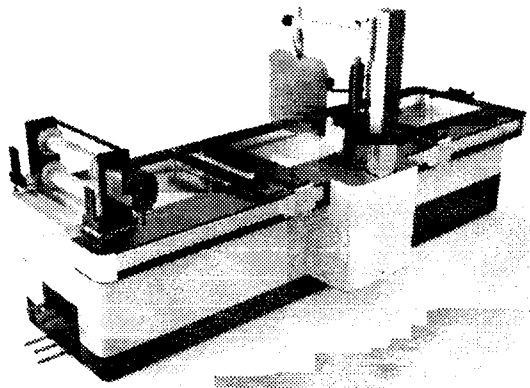


Figure 1. LB equipment GT-160

Low equipment capital costs, as well as the cost of its operation, class the developed technology with the most cost-effective among surface treatment technologies and coating formation.

References

- [1] G.K. Zhavnerko, V.Ya. Shiripov. Device for formation of nanostructured coatings on solid surfaces. Taiwanese Patent No.: I542532 (2016)
- [2] G.K. Zhavnerko, V.Ya. Shiripov., Hydro and oleophobic coatings for glass. GT technology and promising application areas - World of Glass Journal, May, 2017, 14 p.