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Book Reviews

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Book Reviews

PHYSICO-CHEMICAL BASIS OF FORMATION OF NON-WOVEN MATERIALS

**V. B. Tikhomirov, Legkaya Industriya Publ., Moscow 1969.
328 pp. Rub. 2.29.**

The seven chapters of this monograph deal with (1) the present concepts of the structure of non-wovens, (2) the adhesion of polymers to fibers, (3) the effect of the binder properties on those of non-wovens, (4) the effect of the fiber properties on the latter, (5) formation of non-wovens with polymer dispersions, (6) application of low-melting fibers as binders, and (7) the radiation method of manufacturing non-wovens.

Experimental data obtained in the author's laboratory are the backbone of the book. In every instance, their description is preceded by a critical review of the results found by the earlier investigators and by an indication of the main problems not yet solved in that work. Then the author's experiments are reported, and the advance achieved is emphasized; some readers will no doubt judge the advance less generously than the author does.

For this Journal, the chapter on adhesion will be of a particular interest. The reviewer is almost disarmed by the author's statement (p. 56) that he "was not interested in adhesion as such but attempted to solve a relatively narrow problem" of the interaction of polymer fibers and thermoplastic binders. After expounding the theories at present popular in Russia, the author reaches the conclusion that the question of which is the best should not even be asked. When experimental data are obtained, an examination should be made which of the theories gives the best account of these data. The reviewer feels that this philosophy is almost equivalent to the statement that the laws of nature may be switched on and off to suit the varying desires of the research man. However, the author's experiments should not be disregarded because of his philosophy; some of them are very interesting.

The book concludes with 200 references to Russian and 100 references to foreign publications.

J. J. Bikerman

ADHESIVES FOR METALS. THEORY AND TECHNOLOGY

Nicholas J. DeLollis. Industrial Press Inc., New York 1970. 230 pp. \$15.00.

The author "worked with synthetic resins and adhesives for almost twenty-five years" before writing this book, and the attention bestowed on practical applications is visible on almost every page of it; no mathematical expressions are used anywhere.

The introduction deals with the history, the advantages and disadvantages of adhesive fastening and with the nomenclature. The latter is taken over from the ASTM Book of Standards and not subjected to criticism. Chapter 2 reviews some theories of adhesive joints; stress is placed on chemical bonds between adherend and adhesive and on the displacement of the solid adhesive by atmospheric water from the adherend surface. Cleaning and surface treatment of metallic adherends are reviewed next. Some advice given here is rather elementary; for instance, "solvent should be poured on the cloth, so that the cloth never comes in contact with the solvent in the container". The discussion of primers is particularly interesting as many publications on adhesive joints pay little regard to these devices. Chapter 4 describes various types of joint (butt, lap, etc.). The next three chapters list the main adhesive and sealant materials with some strength data, suppliers, and prices (from \$1.25 to \$50 per pound). Chapter 8 deals with stress relief and similar problems; among many interesting items it is stated that "the use of adhesives in place of rivets has increased the life-expectancy of the rotor blade (in helicopters) from 200 to more than 2000 hours". Preparation of bonded assemblies is considered next; the emphasis is on the aircraft industry. Only a short space is allotted to destructive and non-destructive testing. In Chapter 10, some industrial applications are mentioned. A large passenger plane uses 4000 square meters of adhesive films (of unspecified thicknesses), nearly 450 kg of polysulfide rubber sealant, and over 20 kg of silicone rubber sealant. The final chapter is on conductive adhesives which contain metallic fillers or carbon particles. Several federal and military specifications are listed in the appendix.

J. J. Bikerman