

Dneproshina Open Joint Stock Company on the threshold of the new millennium

V.V. Verbas, A.G. Smirnov, A.P. Naumenko and V.I. Varivoda

Translation submitted by P. Curtis

Selected from International Polymer Science and Technology, 28, No. 4, 2001, reference KR 01/01/29; transl. serial no. 14539

The famous first enterprise of the tyre industry in the Ukraine began its renowned operation in April 1961; in August 1994 it became the Dneproshina Open Joint Stock Company.

The most complex period in the formation of Dneproshina was the mid-1990s, when, under conditions of chronic non-payments, thriving bartering, extreme limitation of recycling facilities, and a catastrophic fall in the market, the problem of product competitiveness revealed itself very starkly. Under such complex conditions, the decision was taken, unprecedented for the tyre industry of CIS countries, to create its own Scientific and Technical Centre for the purpose of updating and expanding the product range of Dneproshina.

In the past few years, pneumatic tyres for cars, car trailers, light-duty lorries, and minibuses have developed most dynamically. Here, with the one exception of the 6.45-13 tyre (model DP-68), all new tyre developments are of radial tubeless design. A total of 34 sizes and 47 models of tyres are produced, of which over 70% are radial, while about 25% have a winter tread pattern (135/80R12, 175/70R13, 185/65R14, 195/65R15, 185/75R16, etc.).

In particular it is necessary to single out the creation of a new size series for Dneproshina of special tyres for light-duty lorries and minibuses; it currently includes five sizes and six models of road, all-weather, and winter tread patterns (175R16C, 225/60R16, etc.).

The authors are in the Dneproshina Open Joint Stock Company, Dnepropetrovsk

The range of pneumatic tyres for lorries, lorry trailers, buses, and trolleybuses has also undergone considerable changes and consists of 17 sizes and 27 models, 60% of which are of radial design. In particular it is necessary to single out the creation and assimilation in standard production of tyres with reduced rolling resistance (12.00R20), the preparation for standard production of the first of a series of tyres with a winter tread pattern (9.00R20), and the organisation of the trial production of all-metal cord tyres (295/80R22.5 and 315/80R22.5).

Tyres for tractors and agricultural machinery have traditionally occupied and continue to occupy a special place in the product range of Dneproshina. The rapid penetration on the CIS market of imported and licensed equipment fitted with tyres generally little adapted to specific service conditions largely promoted a considerable product expansion. The number of pneumatic tyres unique to the tyre industry of the CIS numbers 43 sizes and 45 models, over 65% of which are radial tubeless tyres: ultralow pressure (66 × 43.00R25);

- series '50' (600/50R22.5);
- series '60' (500/60R22.5);
- series '70' (480/70R24, 710/70R38, 620/70R42, etc.);
- series 'AGROWORK' (18.4R24, 18.4R26, 650/75R32, etc.);
- series 'NARROW' (11.2R32, 9.5R44, 9.5R48, etc.).

Dneproshina is now the only producer in the CIS of the vast majority of sizes of agricultural pneumatic tyres.

For many years the enterprise produced only seven sizes and ten models of controllable-pressure pneumatic tyres. However, from 2000, when Dneproshina was confirmed by the Ukrainian Ministry of Defence as the leading organisation for the development and production of tyres for military equipment, work was begun on updating the range of a number of these tyres.

Pneumatic tyres for mopeds, motor scooters, and motorcycles come in six sizes at Dneproshina.

The variety of consumer requirements for tyres for off-road quarry vehicles and road-building, material-handling, and mining vehicles makes it impossible to confine production to pneumatic tyres. Of the total number of tyres of the given designation (34 sizes and 45 models), pneumatic tyres account for no more than 65%.

Along with expansion of the range series of pneumatic tyres (29.5 × 29, 16.00-24, etc.) and the assimilation of a series of tyres with reduced rolling resistance (18.00-25, 21.00-33, etc.), intense research is being carried out on the creation of a size series of new-generation non-pneumatic tyres – safety tyres.

Safety tyres of the solid high-elastic (SHE) series, interchangeable with traditional pneumatic analogues, number 13 sizes and 16 models so far (4.00-8 SHE, 6.50-10 SHE, 8.25-15 SHE, 8.25-20 SHE, 12.00-20 SHE, 17.5-25 SHE, etc.).

Intense updating of the range of Dneproshina tyres, the number of models of which is approaching 180, and the assimilation of new types of product would simply be inconceivable without uniquely significant developments in the field of specialised equipment.

The Dneproshina workforce not only modifies existing equipment. Fundamentally new designs are being created, among which a special place is occupied by compact duplex units for the combined production of the running part of the tread with mini-sidewalls and sidewalls with a wear-resistant rim band.

The existing production capacities at Dneproshina make it possible to produce not only tyres but also a wide range of different mechanical rubber goods.

Hose, for instance, is produced in the following range: high pressure hose with metal braid, normal and fire and explosion proof; high pressure hose, metal wound; high pressure hose with end connection; rubber pressure hose with strand reinforcement, etc. To this must be added rubber-reinforced caterpillar tracks, pneumatic cylinders, technical plates, rubber matting, sleeves, gaskets, rubber-reinforced seals, shock absorbers, silent blocks, connecting rings, and many other mechanical rubber products for the repair of rail track and rolling stock and ship and auto repair.

In particular, the creation and production of the following new products for Dneproshina must be pointed out:

- elastic blocks for tram or railway tracks, whether straight or curved and single- or double-track;
- linings for protection against wear and mechanical damage to the surface of mining and beneficiation machinery, such as mills, crushers, pelletisers, skips, vehicle bodies, flotation units, pumps, etc.;
- devices for spanning the cavity of piping during emergency repair work;
- covers and scrapers for cleaning oil and gas pipelines;
- containments for separating grout and drilling mud during the cementing of wells;
- 'Flex-Flow' valves and separators for the shock wave damping system at pumping stations (of the ARKRON-1000 type).

However, it is not the updating of the product range of Dneproshina that is important, but rather its combination with a reduction in the material and energy consumption of production. Thus, if the material requirement of products is liable to vary significantly at the development stage, then estimation of its energy requirement is known to be a considerably more complex and multifactor problem. The enterprise has come close to solving this problem at source, i.e. in the steam boiler house. It turned out that energy losses previously assumed to be unavoidable, arising when the steam parameters were lowered to the level required by the technology, can be used to produce works electrical energy. As a result, it is suggested that implementation of this one measure alone in the near future will cover at least 50% of the power consumption of Dneproshina.

In 1999, the Technical Committee of the Ukraine (TK 46) and the Intergovernmental Technical Committee of the CIS (MTK 86) for Tyres and Tyre Industry Products were set up at the Scientific and Technical Centre of Dneproshina. Committee TK 46 is the leading organisation in the Ukraine for standardisation of the industry, a fully fledged member of the ETRTO, an active member of six subcommittees of the ISO, and an associate member of the European organisation CEN. To adapt not only Dneproshina but also other tyre enterprises of the CIS to the requirements of the international standards, 11 intergovernmental (GOST), 14 state (DSTU), and 6 industry (GSTU) standards have already been developed.

All new developments of tyres and mechanical rubber goods produced by the Scientific and Technical Centre of Dneproshina comply with the requirements of the international systems of standardisation, and the technical solutions used in this case are patent protected.

From the results of investigations carried out, two books have been produced, over 50 works have been published, and over 60 patents have been obtained.

Dneproshina is one of the largest enterprises not only in the Ukraine but also in Europe. The high quality of its tyre products is confirmed by certificates of compliance with the system of quality of the Ukraine (UkrSEPRO), Russia (RST), and Europe (E). A total of 60% of the products are exported, covering more than 30 countries of Eastern and Western Europe, the Near and Middle East, South-Eastern Asia, and South America, and also the United States and Canada (the ratio of export shares to countries of the CIS and to countries outside the former USSR amounts to 4:1).

The high product quality and the effective penetration on the world market of tyre products of Dneproshina have been marked by numerous international awards: 'Best Trading Company' (Spain, 1994 and 1996), 'Diamond

Quality Award' (Mexico, 1995), 'Golden Globe' (1996), 'Torch of Birmingham' (USA, 1998), 'FIGAV Gold Medal for Quality' (Cuba, 1999), 'Gold Star for Quality' (Switzerland, 1999), 'EuroMarket-99' (Switzerland, 1999).

Expansion of the product range and improvement in the product quality and technical level remain priorities in the development of the Dneproshina Open Joint Stock Company.

*(No References)
Received 30. 10. 2000*