Electrode manufacturing at PPWE of the E.O. Paton Electric Welding Institute

Pilot Plant of Welding Equipment (PPWE) manufactures a wide range of professional welding equipment, and now The Plant is its leading manufacturer in the territory of Ukraine and CIS countries.

In order to widen the range of manufactured products and strengthen its market positions, PPWE management took the decision to master production of coated welding electrodes. After a long preparation process, at the beginning of April, 2016, electrode manufacturing was started under PATON™ trade mark. Modern technologies and strict incoming inspection of raw material quality are used in the new production section, and a professional expert team is continuously following development of welding consumables manufacturing with the purpose of timely introduction of innovations.

Pilot Plant of Welding Equipment produces electrodes by the classic formulations of demanded electrode grades: ANO-21, ANO-36, ANO-4, UONI 13/45, UONI 13/55, MR-3, special electrodes for surfacing T-590, cast iron welding TsCh-4, high-alloyed steel welding OZL-8 and TsL-11; as well as electrodes of ELITE series by improved formulation: Elite ANO-36, Elite ANO-21, 7018 Elite.

Thus, the range of PATON™ coated electrodes now looks as follows:

Elite series

- UNIVERSAL (RUTILE, WITH IRON POWDER);
- 7018 (BASIC, WITH IRON POWDER);
- Elite ANO-36 (RUTILE-CELLULOSE WITH 8 % CELLULOSE CONTENT);
- Elite ANO-21 (RUTILE-CELLULOSE WITH 6 % CELLULOSE CONTENT);
- Elite MD6013 (RUTILE).

Classic series

- ANO-36 (RUTILE-CELLULOSE WITH 8 % CELLULOSE CONTENT);
- ANO-21 (RUTILE-CELLULOSE WITH 6 % CELLULOSE CONTENT);
- ANO-4 (RUTILE);
- MR-3 (RUTILE);
- UONI-13/55 (BASIC).

SPETsELEKTRODY series

- T-590 for surfacing;
- OZL-8; TsL-11 for welding stainless steels;
- TsCh-4 for welding cast iron.

The most well-known and accepted group of electrodes of E46 type includes electrodes of ANO-4, MR-3, ANO-21, ANO-36 grades and other welding electrodes.

Over the recent years rutile-cellulose electrodes of ANO-21 and ANO-36 grades, made by PWI formulation, became the most widely accepted. By their purpose and applications, they are designed for manual arc welding at direct or alternating current of conventional and critical structures from low-carbon steels, supplied to DSTU 2651/GOST380 (St0, St1, St2, St3 of all groups A, B, C and all degrees of deoxidation — «KP»(rimmed), «PS»(semi-killed), «SP»(killed)) and to GOST 1050 (05kp(rimmed), 08kp(rimmed), 08, 10kp(rimmed), 10ps(semi-killed), 10, 15kp(rimmed), 15sp(semi-killed), 15, 20kp(rimmed), 20sp(semi-killed), 20), in all positions (except for vertical downward for 5.0 mm electrodes).

Formulations and manufacturing technology of these electrode grades, corresponding to the requirements of GOST 9466–75 by their composition and mechanical properties, are very broad, that sometimes allows the manufacturer maneuvering under the conditions of tough competition, without going beyond the GOST requirements. Therefore, the main quality indices of welding electrodes from different manufacturers, and even from one manufacturer taken separately, can be somewhat different by their welding-technological characteristics. The change of welding characteristics of the electrodes is also influenced by the ability of each

manufacturer to develop their own specification, which later on allows using new components and technological operations in electrode manufacture.

PWI PPWE took a number of measures to improve the quality of manufactured products. They include: modification of the formulations applied in manufacture of the main electrode grades, for improvement of welding-technological and consumer characteristics, introduction of advanced innovation developments (application of a complex ferroalloy modifier from one of the world's best manufacturers); supply diversification and geographic expansion of the known and new raw materials, also from foreign countries (cellulose — Switzerland, potassium-sodium lump — Germany, mica — India, etc.); toughening both incoming and outgoing inspection of the quality of raw materials and products; redesigning and improving the quality of packing materials with application of three layer packing, that guarantees preservation of welding-technological properties of the electrodes all the way from the Plant to end user.

Application of new kinds of raw materials allowed considerable improvement of welding-technological characteristics of the electrodes that expanded their application both in the industrial sector and for household purposes. When upgrading the formulations, a lot of attention was given to their ecological safety, sanitary-hygienic characteristics and safety for welder's health.

In 2017, within the strategy of development of this area, the technology park for electrode manufacture was complemented by a modern automatic line of the capacity of 12 t per shift. In the same year 2017 CE certificate was obtained, which confirmed the product compliance with EC norms, and deliveries to the markets of the European countries were started. Today PATON™ electrodes are supplied to the markets of more than 25 countries all over the world — from Latin America to South Korea.

Despite the short term presence in the welding electrode market PATON™ welding electrodes managed to prove themselves and become an indispensable assistant in welding operations in different areas: construction, machine- and ship-building, agriculture, fabrication of different metal structures, etc. And electrodes of Elite series, manufactured by the improved formulation, became widely accepted for welding operations by ordinary users to solve household tasks, due to their insensitivity to the quality of the surfaces being welded, easy initial and secondary ignition, as well as stable arcing.

ОЗСО им. Е.О.ПАТОНА с 1959 г.
ПАТОН
66 Novopyrohivska Str., 03045, Kyiv, Ukraine
+38 (044) 259-40-00
E-mail: office@paton.kiev.ua