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| LLC «TOSHKENT METALLURGIYA ZAVODI» |
| APPROVED by:Chief Engineer\_\_\_\_\_\_\_\_\_\_\_ V. A. Diakonov«\_\_\_\_\_» \_\_\_\_\_\_\_\_ 2023. |
| TECHNICAL SPECIFICATION NO. 008for the supply of raw materials |
| **Customer** | LLC “TOSHKENT METALLURGIYA ZAVODI” |
| **Address**  | 4P21, Tashkent bypass road, Yangihayot district, Tashkent, the Republic of Uzbekistan. |
| **Contact** | Tel.: +998 55 503 88 11 <http://tashkentsteel.uz> |
| **Product name** | PROTECTIVE ENAMEL ON THE BACK SIDE (PE, EP, EPE) |
| **Standard** | Supplier's ND |
| **Product Designation** | The enamel is intended for painting of galvanized strip from the back side on the coater of the color coating line (CCL). |
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| **Requirements for the paints and varnishes** |

| **Сharacteristic name** | **Indicator** |
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| Drying temperature, °C | 224-243 |
| Dwell time, sec. | ≥25 |
| Conditional viscosity according to GOST 8420-2022 at 20 °C, s | 60 to 100 |
| Degree of grinding according to GOST 31973-2013, mkm | no more than 40 |
| Density of liquid paint (paintwork) according toGOST 31992.1-2012 (ISO 2811-1:2011), g/cm3 | 1.05 to 1.49 |
| Non-Volatile Substance Content O‘z DStISO 3251:2019 (ISO 3251:2019, IDT), % | at least 45 |
| Suitable solvent | Solvesso 150 |
| Suitable soil (compatibility\*) | Chromate-free polyester primers, including those from other manufacturers, used in APP |
| \* *Compatibility is a set of quality indicators of polymer-coated rolled products, on the basis of which the metal rolled products are certified in Class 1 in accordance with GOST 34180-2017. This information is provided by the Customer.* |

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| **Requirements for the paint coating** | **Test methods according to GOST 34180-2017 with amendments 1:**- appearance: ***uniformly colored surface without bubbles, streaks, small pores and other defects;******-*** dry film thickness, mkm: ***4-12;***- Flexural strength T (cracking): ***no more than 3***;- Adhesion after stretching, %: ***0***;- Back impact strength, J: ***at least 5***;- Eriksen tensile strength, mm: ***at least 4***;- Abrasion resistance (IEC): ***at least 50 double passes***;- Resistance to salt fog, in accordance with the requirements of subsection 6.2 of GOST 9.401-2018, hour: ***не менее 500.***The enamel shall provide adhesion to polyurethane (PUR) foam, polyisocyanurate (PIR) foam and polyurethane adhesives. |
| **Characteristics of the metal base** | ССL feedstock features:- galvanized strip, skin-passed, primed;- thickness, mm: from 0.29 to 0.7;- width, mm: from 800 to 1250;- zinc coating, grade: 60 to 275;- surface with conversion coating Cr+6, Cr+3;- strip yield strength, MPa: max. 510;- strip tensile strength, MPa: max. 550. |
| **Additional requirements** | - Paintwork materials must be supplied ready for use on color coating lines;- in case of changes in formulation, raw materials, production technology, modernization of equipment, the manufacturer of paintwork materials shall inform in advance. In this case, batches of paintwork materials are designated as "experimental";- each batch of paintwork materials is subjected to incoming inspection tests. The parameters of the paintwork materials to be checked during the incoming inspection are determined according to the approved technical specification;- the manufacturer shall guarantee that all raw materials used for the production of paintwork materials are authorized for use in the Republic of Uzbekistan, have safety data sheets and quality certificates;- coatings on the basis of paintwork materials should be suitable for interior finishing products and for manufacturing of facade parts of houses and buildings (panels, siding, metal tiles, etc.);- the supplier shall provide data on recommended solvent grades for viscosity correction of the paintwork materials as part of the offer. |
| **Main technological modes** | Speed modes:- process, max, m/min: 160;- filling, max. m/min: 210.Drying furnace:- total length of the oven, m 60;- number of zones 6;- length of each zone, m: 10.- fuel: natural gas;Temperature regimes:- maximum temperature of the drying oven atmosphere, °С: 400;- peak strip temperature (RTM), °С: 216-241;Strip cooling after the drying furnace: water (spraying).Length of water-cooling section, m: 2.Strip temperature at the outlet after the cooling section, °С: not more than 45.Strip drying is carried out in the air blowing unit at ambient temperature. |
| **Packaging requirements** | The products shall be delivered in original containers (packaging) provided by the manufacturer (barrels, steel drums - with internal chemically resistant protective coating).Paints and varnishes shall be packed in such a way as to exclude their damage and/or destruction during loading, transportation, unloading, storage and unpacking at the Consumer. |
| **Marking requirements** | Labeling shall contain the following information:- name of the manufacturing company;- product name;- batch number;- date of production;- brand of paintwork materials;- net/gross weight;- hazard class;- storage conditions, protective measures, warning inscriptions and hazard markings, disposal method.Other data at the discretion of the supplier. |
| **Documentation requirements** | Certificate/quality passport for each batch. Technical conditions or standards of the organization with technical requirements for the products.Safety passport for the products.Manufacturer's recommendations/instructions on use, storage, handling of the Goods.All documentation shall be in Russian and/or English. |
| **Guaranteed storage life** | The manufacturer (supplier) is obliged to guarantee the quality of incoming batches of products in accordance with the requirements of this technical specification.Guaranteed shelf life of the products: not less than 6 months from the date of production under observance of storage and delivery conditions. |
| **Sample lot volume** | For laboratory testing (if necessary): 0.5 kg.For industrial tests: not less than 400 kg (to be additionally agreed upon when placing an order).With each supplied batch of paintwork materials for incoming inspection the accompanying coloring sheet with the results of testing of paintwork materials at the manufacturing plant shall be provided. |

Designed by:

Deputy Chief Technologist Sh. R. Fazilov

Approved by:

Chief Technologist B. A. Turabekov

Quality director T.V. Dolgopolova

Head of sheet rolling shop A. N. Kapustnikov

Head of procurement and supply chain E. B. Turakulov