roads and highways
research institute
03-302 Warsaw, 1 Instytutowa St.

Warsaw, March 16, 2023.

IBDiM TECHNICAL RECOMMENDATION

No. IBDiM-RT-2023/0200 issue 1

After the recommendation procedure, which the applicant is a manufacturer, named:

based: **PHSC Chemicals Ltd.**
Droga Dębińska 29, 61-492 Poznań

Road and Bridge Research Institute

states a positive assessment of the performance and suitability of the construction product:

Special coatings for surface protection against graffiti

with the trade name: **KTX07 , KTX 30**

for use in traffic construction, within the scope of application and intended use, and meeting the conditions specified in this IBDiM Technical Recommendation

DYREKTOR
dr inż. Mariusz Urbański

DIRECTOR
Road and Bridge Research Institute

Date of Technical Recommendation March 16, 2023.
Expiration date of Technical Recommendation: March 16, 2028.

1 NATURE OF THE TECHNICAL RECOMMENDATION

Technical Recommendation **No. IBDiM-RT-2023/0200 Issue 1** is a voluntary document recommending the product: **KTX 07, KTX 30** for use in transportation construction to the extent specified in Section 3.2 of this Technical Recommendation.

2 TECHNICAL DESCRIPTION OF THE CONSTRUCTION PRODUCT

2.1 Technical name and trade name

The subject of this Technical Recommendation is a construction product with a technical name:
Special coatings for surface protection against graffiti
and trade name: **KTX 07, KTX 30.**

2.2 Manufacturer's designation and name:

The manufacturer of the product is: **PHSC Chemicals Sp. z o.o. 29 Droga Dębińska , 61-492 Poznań.**

2.3 Place of production of the construction product:

The product is manufactured at**: PHSC Chemicals Sp. z o.o. 29 Droga Dębińska , 61-492 Poznań.**

2.4 Technical description product construction product and the used materials and raw materials.

Identification of the product.

The subject of the Technical Recommendation is a product that protects surfaces from graffiti:

KTX 07 - a one-component product based on silanes and siloxanes, forming a durable anti-graffiti coating.

KTX 30 - a one-component product based on hydrocarbon resin and silicon dioxide, forming a durable anti-graffiti coating.

The identification properties of the products are specified in table 1.

Table 1

Lp.	PROPERTIES	Units	Requirements	Test methods by
1	*2*	*3*	*4*	*5*
1	Density at +20°C KTX 07 KTX 30	g/crn3	0,90 ± 5% 0,80 ± 5%	PN-EN ISO 2811-1:2016
2	Viscosity KTX 07 KTX 30	mPa s	652 ±10% 2,20 ± 10%	PN-EN ISO 2555:2018-07 PN-ISO 2431:2019-07
3	Infrared spectrum	-	Appendix drawing Z-1÷Z2	PN-EN 1767:2008

3 PURPOSE, SCOPE AND CONDITIONS OF USE OF THE PRODUCT

3.1 Intended use of the product

KTX 07, KTX 30 products are intended for use in transportation construction, within the scope of application specified in Section 3.2 for the performance of a coating to protect surfaces [e.g., polycarbonate, glass, acrylic glass (PMMA)] from graffiti.

3.2 Scope of application of the product

Scope of use of the construction product:

3.2.1 Road engineering structures without restrictions,

within the meaning of and in accordance with the conditions set forth in the Decree of the Minister of Infrastructure of June 24, 2022 on technical and construction regulations for public roads (Journal of Laws of 2022, item 1518.).

3.2.2 Railroad engineering structures without restrictions,

within the meaning of and in accordance with the conditions set forth in the Order of the Minister of Transport and Maritime Economy of September 10, 1998 on the technical conditions to be met by railroad structures and their location (Journal of Laws of 1998, item 987, as amended).

3.2.3 construction facilities of urban railroad "metro" without restrictions,
within the meaning of and in accordance with the conditions set forth in the Regulation of the Minister of Infrastructure of June 17, 2011 on the technical conditions to be metro buildings and their location (Journal of Laws of 2011, No. 144, item 859).

3.3 Conditions of use of the product

KTX 07, KTX 30 products should be used in accordance with the Technical Sheets, which contain detailed conditions and method of application.

Work can be carried out when the temperature and humidity are contained within the following limits:

- In terms of air temperature:
  - KTX 07: +5 to +30°C;
  - KTX 30: from +5 to +30°C
- In terms of substrate temperature: the substrate temperature should be at least 3°C higher than the dew point temperature at a given ambient temperature and humidity;
- In terms of humidity: the relative humidity of the air must not exceed: 80%.

The capacity of the product applied to 1 m^2 of absorbent surface is:

- KTX 07 - up to 6 m^2 /1;
- KTX 30 - up to 10 m /l.[2]

The capacity of the product applied to 1 m^2 of non-absorbent surface is:

- KTX 07 - up to 10 m^2 /1;
- KTX 30 - up to 111 m^2 /1.

During the preparation of the product and during its application, it is necessary to follow the health and safety instructions given by the manufacturer.

The product should be used in accordance with the purpose, scope and conditions, which are given in the Technical Recommendation and in the technical and construction regulations applicable to the various types of structures in the transportation construction industry. Before the product is used in a manner inconsistent with the technical and construction regulations, permission must be obtained to deviate from these regulations in accordance with the procedure specified in Article 9 of the Act of July 7, 1994, Construction Law (Journal of Laws of 2006, No. 156, item 1118, as amended).

The application of the product should be carried out in accordance with the instructions provided by the manufacturer. In particular, the mixing ratios of the products recommended by the manufacturer should be observed, as well as their shelf life at a given temperature.

4 PERFORMANCE CHARACTERISTICS OF THE CONSTRUCTION PRODUCT AND THE METHODS USED TO ASSESS THEM

The performance characteristics of the KTX 07 and KTX 30 construction product are summarized in table 2.

Table 2

Lp.	Trade name product	Properties	Demands	Unit.	Research methods
1	2	3	4	5	6
1	**KTX 07 KTX 30**	Time from application to receipt Protective properties against graffiti (when applied in accordance with the technical instructions and an ambient temperature of +20°C)	24	h	According to the manufacturer's declaration
		Maximum graffiti removal time since its imposition	without restrictions	-	
		Condition of the coating laid on the substrate concrete after 200 cycles of freezing and defrosting in water, at temp: -18°C /+18°C	unchanged	-	Procedure IBDiM PB/TM-1/6:2016
		Number of graffiti removal cycles depending on the durability of the protection *L:* permanent	≥8	-	ASTM D 6578-13
		Graffiti removal rate S	V	-	ASTM D 6578-13
		Capillary absorption	≤ 0,1	$kg \cdot m^{-2} \cdot h^{-0,5}$	PN-EN 1062-3
		CO2 permeability	≥ 50	m	PN-EN 1062-6
		Water vapor permeability	≤ 4	m	PN-EN ISO 7783

5 PACKAGING, TRANSPORTATION AND STORAGE

5.1 Packaging guidelines

Products should be packed in tightly closed plastic containers to prevente from spillage, contamination or change in technical and functional properties.

The products are delivered in packages:

- KTX 07: cans, 5 L, 10 L, 20 L canisters,
- KTX 30: aluminum bottles of 100 ml, 0.5 L, 1 L, 5 L.

5.2 Detailed method of marking the product

Each package should be accompanied by information in Polish containing the following data:

a) the designation, headquarters and address of the manufacturer and the address of the plant producing the product,
b) product identification including: technical name, trade name, type, variety, grade, according to technical specifications,
c) the number and year of issue of this IBDiM technical recommendation, with which the compliance of the product is confirmed,
d) shelf life.

5.3 Transportation and storage guidelines

The products should be transported in accordance with the transport law, by covered means of transport, protecting the packaging from frost and mechanical damage.

Store KTX 07, KTX 30 products in original, tightly closed containers, in heated and dry rooms, at temperature:

- KTX 07: +5 to 28°
- KTX 30: +5 to 15°C

The shelf life of products stored in closed containers, is 12

months. Protect containers from direct sunlight and frost.

6 CONFORMITY ASSESSMENT

The basis for assessing the conformity of a product are:

— preliminary type testing
— factory production control

6.1 Preliminary type examination

Initial type testing performed before placing the product on the market confirms the required performance and technical properties.

Initial type testing includes all the requirements listed in table 2.

Initial type testing, which relates to the basic requirement: safety of use, should be performed again in a situation where the results of previously performed tests can be questioned, in particular, when the following were made: structural changes to the products, changes in raw materials or components, significant changes in production technology or changes in manufacturing conditions (e.g.: replacement of the technological line, relocation of the production plant, etc.).

6.2 Factory production control

The product covered by this technical recommendation, should be manufactured in accordance with the factory production control system.

The manufacturer shall establish, document, implement and maintain a factory production control system to ensure that the product placed on the market complies with the requirements of this technical recommendation and the declared values.

The factory production control system should include:

a) procedures, instructions, and technical specifications and standards,

b) technical description of the product,

c) regular inspection and testing of raw materials and materials,

d) regular inspection and testing of the finished product,

e) evaluation of the quality of the finished product based on the results of inspection and testing.

Regular inspection and testing of raw materials and materials, as well as the finished product, should be documented through records in the factory production control documentation. The manufacturer should maintain a list of this documentation including the forms used and records kept. The factory production control documentation should be updated when changes occur in the product, the production process or the factory production control system.

The procedures or instructions should document how:

a) supervision of documents and records,

b) to control and confirm the compliance of raw materials and materials with the established requirements,

c) supervising the production process and conducting inspections and tests during manufacturing and at the finished product stage,

d) supervision of production equipment and machinery, product inspection and testing equipment with measurement consistency,

e) conduct evaluation of the conformity of the product with the requirements of this Technical Recommendation,

f) handling of nonconforming product,

g) dealing with reported complaints about the quality of the finished product or raw materials and supplies,

h) conduct corrective and preventive actions,

i) conducting internal audits and management reviews,

j) staff training.

The quality management system applied according to the requirements of PN-EN ISO 9001 can be considered a factory production control system, if the requirements of this technical recommendation are also met.

6.3 Testing of finished products

6.3.1 Research program

The testing program for finished products includes ongoing testing.

6.3.2 Current research

Ongoing testing of finished products includes:

a) density (Table 1),
b) viscosity (Table 1).

6.3.3 Collection of samples for testing

Samples for current tests should be taken in accordance with the arrangements of PN-EN 12060:2002.

6.3.4 Evaluation of test results

KTX 07 and KTX 30 products should be considered to comply with the requirements of this IBDiM Technical Recommendation if the results of all tests are positive.

6.3.5 Frequency of testing

a) Ongoing tests should be performed for each batch of the product in accordance with the test plan established in the factory production control documentation. The size of the product batch should be specified in the factory production control documentation.

b) Testing of samples should be carried out in accordance with the test plan established in the factory production control documentation, but at least once every 5 years.

7 CONCLUSION

7.1 The Technical Recommendation is not a document that authorizes the marking of a construction product before it is placed on the market.

7.2 This IBDiM Technical Recommendation may be rescinded on the IBDiM's own initiative, after an investigation with the participation of the applicant, or at the request of the manufacturer.

7.3 This IBDiM Technical Recommendation is without prejudice to the rights under the Industrial Property Law of June 30, 2000 (Journal of Laws of 2003, No. 119, item 1117, as amended).

8 LIST DOCUMENTS USED RECOMMENDATION PROCEEDINGS, INCLUDING A LIST OF PRODUCT TEST REPORTS

8.1 Polish **Standards** and other **Standards**

a) PN-EN 1062-3:2008 Paints and varnishes - Paint products and coating systems for outdoor use on masonry and concrete - Part 3: Determination of water permeability
b) PN-EN 1062-6:2003 - Polish version Paints and varnishes -Paint products and coating systems for outdoor use on masonry and concrete -Part 6: Determination of carbon dioxide permeability,
c) PN-EN 1542:2000 Products and systems for the protection and repair of concrete structures - Test methods - Measurement of adhesion by peeling,
d) PN-EN 1767:2008 Products and systems for the protection and repair of concrete structures - Test methods - Infrared analysis,
e) PN-EN ISO 2431:2019-07 - Paints and varnishes - Determination of flow time using flow cups,
f) PN -EN ISO 2811-1:2012 Paints and varnishes- Determination of density- Part1 : Pycnometric method,
g) PN-EN ISO 7783:2018-11 Paints and varnishes - Determination of water vapor transmission properties - Method using a pot,
h) PN -EN ISO 9001:2015-10 Quality management systems - Requirements,
i) ASTM D6578-13(2018) Standard Practice for Determination of Graffiti Resistance.

8.2 Test procedures

a) IBDiM Test Procedure No. PB/TM-1/13:2009 Evaluation of the condition of the protective coating (or plaster) after frost probing,
b) IBDiM Test Procedure PB/TM-1/6:2016 Measurement of adhesion by peeling.

8.3 Construction product test reports

a) IBDiM Research Reports, Warsaw, 2020, 2022,
b) Factory production control test reports - PHSC Chemicals Sp. z o.o., Poznań, 2020,
c) Research provided by PHSC Chemicals Ltd: WoodChem Marcin Skalski dated 27/10/2021.

Attachment: 1

Receive:

1. Applicant named: **PHSC Chemicals Sp. z o.o.** with registered office: **Droga Dębińska29, 61-492 Poznań- 1copy**
2. a/a Technical Assessment Unit: **Road and Bridge Research Institute,** Instytutowa 1, 03- 302 Warsaw tel: (22) 39 00 220 227, e-mail: jot@ibdim.edu.pl **-1 copy**

ANNEX 1

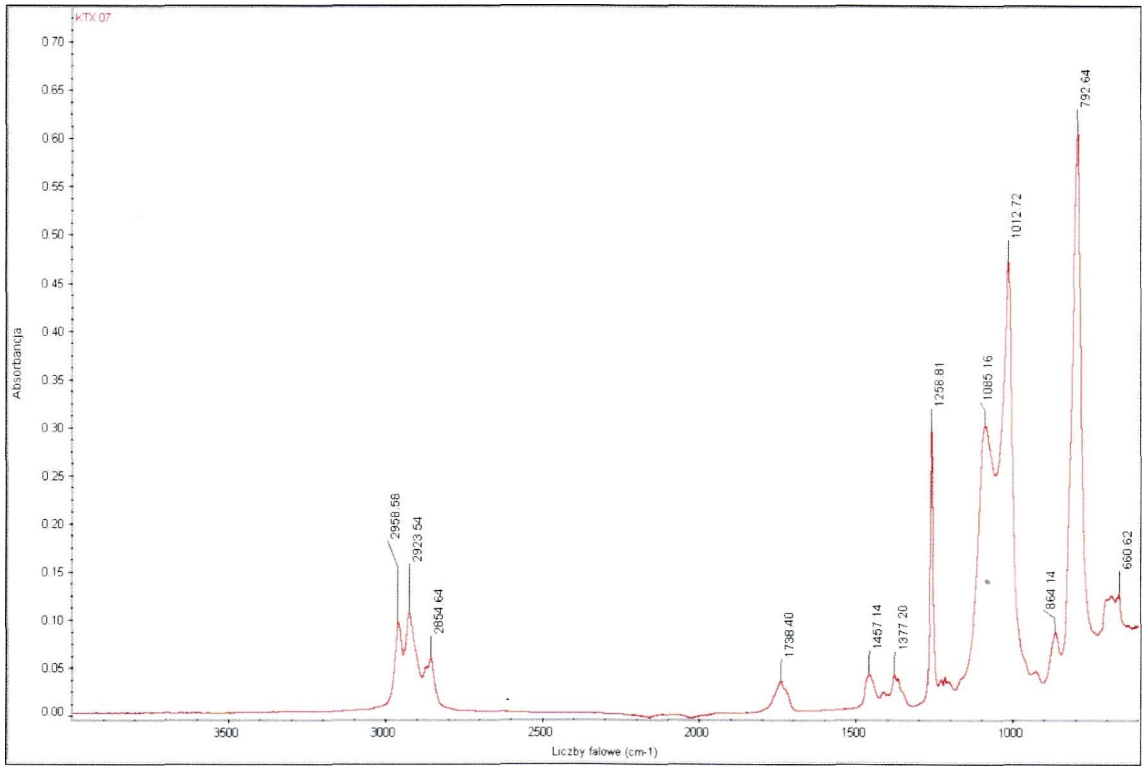

Figure Z-1: KTX 07 product - spectrum made by infrared spectroscopy method

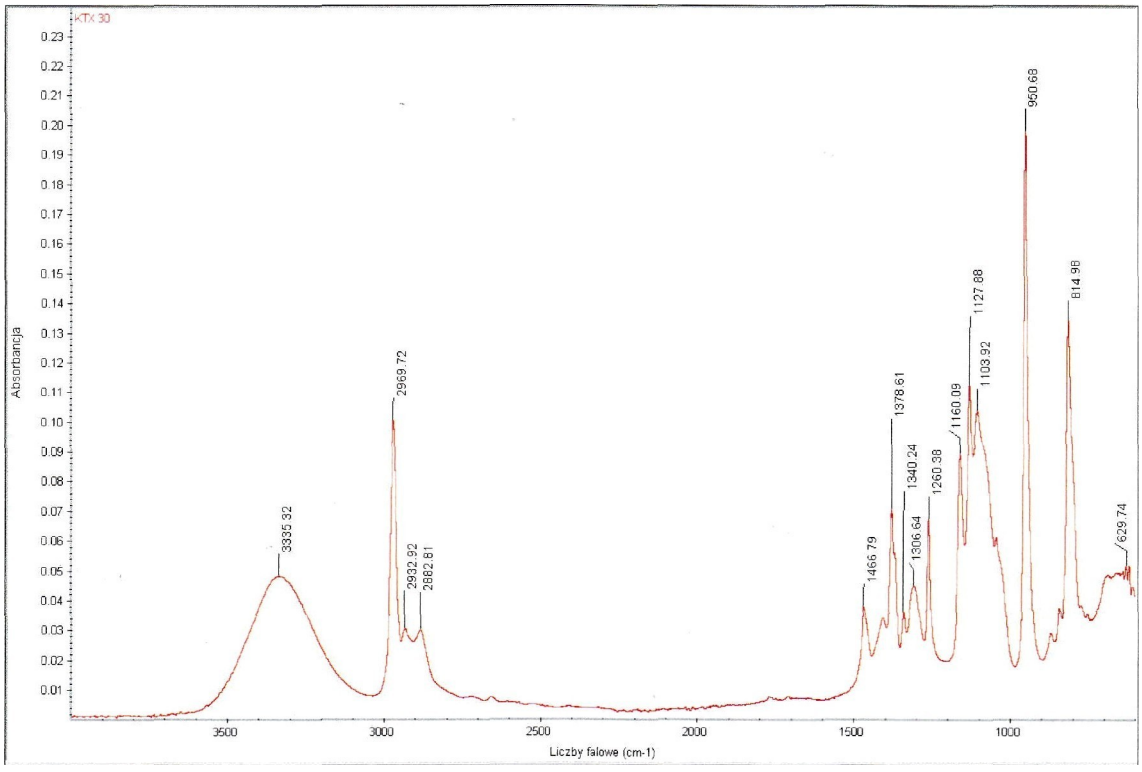

Figure Z-2: Spectrum of the KTX 30 product by infrared spectroscopy.