



QUALITY CERTIFICATE No. 127
Catalyst IM-2201
TU 38.103706-90 with amendments No 1-8

Date of manufacture 07.12.2021 **Sampling location** Rail tank car
Date of sampling 07.12.2021 **Net weight:** 58,500 kg
Test date 07.12.2021 **Rail tank car No.** 97007975

The tests were carried out at the Test Center - Quality Control Department of NNK JSC

Certificate of accreditation No. ROSS RU.0001.515720 Date of information entry into the register of accredited entities July 29, 2015.

Item No.	Indicator	Standard	Actual	Testing method
1	Overall view	Grey-green powder	Grey-green powder	TU 38.103706-90, p. 4.2
2	BD (bulk density), g/cm ³	1,00-1,40	1.23	Measuring technique №24
3	Mass content of the fraction <71 μm, %	no more than 40	26	Measuring technique №23
4	Mechanical strength, %	no less than 72	78	Measuring technique №25
5	Specific surface area, m ² /g	30-60	52	Measuring technique №27
6	Catalytic properties: yield of unsaturated hydrocarbons Cd per n-butane processed, % yield of unsaturated hydrocarbons Cd per n-butane processed, % butane, %	no less than 39 no less than 80	42 81	Measuring technique №26
7	Mass fraction of hexavalent chromium expressed as hexavalent chromium oxide, %	1,00-3,50	1.76	Measuring technique №28

Note: Indicator for p. 1 is not included in the scope of accreditation of the Test Center - Quality Control Department of JSC NNK Test Methods for pp.2-7 meet the TU 38.103706-90 specifications

Conclusion: Catalyst IM-2001 meets the technical specifications of:

TU 38.103706-90 with amendments No 1-8

The manufacturer guarantees the product quality conformance with this standard, subject to meeting the terms and conditions of transportation and storage.

Warranty period of storage - 3 years from the date of manufacture.

Specialist

/signature/
(signature)

I.I. Krylova
(last name, initials)

L.S.
/seal /Russian Federation* Samara Region*
Novokuibyshevsk, Joint Stock Company "Novokuibyshevsk Petrochemical
Company"
For documents*/

Certificate issue date 07.12.2021