

XADO TECHNOLOGY TEST REPORT · KAUSTIK JSC

Pump R-171-15 and its motor: bearing vibration dropped with no teardown or shutdown

Kaustik JSC, shop 28 · approved by N. Stepanov, Deputy General Director for Production, endorsed by M. Degtyarenko, Chief Mechanical Engineer · measurements — plant expertise service, treatment — Tekhnoservice Group LLC

Tests 16 Jan – 07 Feb 2002 · report dated 26 Feb 2002 · shop order No. 12 of 14 Jan 2002

PRODUCT

XADO materials
gel into the pump oil system ·
restorative grease into the
electric motor bearings

TEST OBJECT

Heat-carrier transfer pump
item R-171-15
nitrite-nitrate salt · bearing units
of the pump and its drive
electric motor, shop 28

DOCUMENT TYPE

Test report
signed and stamped
vibration measurement
protocols No. 21 and No. 77 of
the expertise service

UNIT**CONDITION AT START OF TESTS****WHAT WAS MEASURED**

Heat-carrier transfer pump item
R-171-15

Vibration-level rating — “good”

Vibration velocity V_{rms} at points 3x,
3y, 4x, 4y

Drive electric motor of the pump

Vibration-level rating —
“acceptable”

Vibration velocity V_{rms} at points 1x,
1y, 2x, 2y, 2z

Treatment without teardown, with the pump running: 21–23 Jan 2002 — gel into the pump oil system, 21 Jan 2002 — restorative grease into the electric motor bearings.

Key result

↓ **24-41%**

vibration velocity in the pump and motor bearings, 1.93-3.83 → 1.26-2.72 mm/s

Pump R-171-15 — vibration velocity by measurement point

MEASUREMENT POINT	BEFORE, mm/s	AFTER, mm/s	Vrms REDUCTION
3x	1.9273	1.2610	34.6 %
3y	2.0066	1.5685	21.8 %
4x	1.9294	1.2811	33.6 %
4y	1.9791	1.6299	17.6 %
Pump average	—	—	27 %

Measurements by the expertise service of Kaustik JSC at fixed points on the running unit: 16 Jan 2002 — before treatment, 07 Feb 2002 — after (protocols No. 21 and No. 77).

Pump drive motor — vibration velocity by measurement point

MEASUREMENT POINT	BEFORE, mm/s	AFTER, mm/s	Vrms REDUCTION
1x	3.8301	1.9137	50.1 %
1y	3.6673	2.7202	26.0 %
2x	2.8807	1.6950	41.2 %
2y	2.0230	1.5275	24.5 %
2z	2.9327	1.8966	35.3 %
Motor average	—	—	35.3 %

A drop in vibration velocity was recorded at all nine measurement points — on both treated units, the pump and the electric motor.

Commission findings and decision

The commission of Kaustik JSC recorded: the drop in vibration level indicates an ongoing process of restoration of the friction surfaces in the bearing units of the motor and the pump. Decision taken:

1. The test result shall be deemed positive; testing on pump R-171-15 shall continue until the actual bearing service life is established.
2. It is recommended to continue test work using XADO technology on similar equipment of the shop and of the plant as a whole.
3. At the start of the tests the pump and the motor had technical condition ratings by vibration level of "good" and "acceptable" respectively, therefore the effect of applying XADO materials proved substantial but not the maximum possible; for this reason it is recommended to select for testing objects with a vibration level close to the maximum permissible.



© XADO. All rights reserved.

The results refer to heat-carrier transfer pump item R-171-15 and its drive electric motor under the conditions of shop 28 at Kaustik JSC; on other equipment and in other operating modes the figures may differ. The original signed and stamped report is published in full and available for download.