TECHNICAL ACTS OF 8 AND 30 JANUARY 2002

# NF-611 and 2VU1-2.5 compressors: higher output, lower temperature — with no unit disassembly

«MZhK Khabarovskii» JSC, ammonia shop and Hydrogenation Plant · signed by: head of the ammonia shop D. V. Zobnin, mechanic of the Hydrogenation Plant A. P. Platonov, representative of XADO Corporation V. Yu. Protsenko

**Khabarovsk, Russia · acts of 8 and 30 January 2002 · signatures and stamps of the parties**

**PRODUCT**

XADO compound

restorative repair of compressors by XADO technology

**TREATED EQUIPMENT**

Compressors of three types

ammonia NF-611 · air 2VU1-2.5/13 · hydrogen, inv. No. 114541/9

**DOCUMENT TYPE**

Technical acts of the plant with signatures and stamps of the parties

| UNIT | SHOP AND CONDITION BEFORE TREATMENT | WHAT WAS MEASURED |
|---|---|---|
| Ammonia compressors NF-611 | Ammonia shop; heavy wear of the crank-and-connecting-rod mechanism and the cylinder-piston group, elevated oil consumption | Oil consumption in service |
| Air compressors 2VU1-2.5/13 | Compressor facility of the plant, regular service | Receiver fill time from 2 to 7 kgf/cm² |
| Hydrogen compressor, inv. No. 114541/9 | Hydrogenation Plant; operating temperature 95 °C | Operating temperature at a discharge pressure of 1.5 kgf/cm² |

The treatment was carried out in two stages; the measurements on the hydrogen compressor were taken in the presence of the mechanic of the Hydrogenation Plant.

## Key results

**↑ 22 %**

output of the air compressors, receiver fill 4 min 10 s → 3 min 25 s

**↓ 10.5 %**

operating temperature of the hydrogen compressor, 95 → 85 °C

## Air compressors 2VU1-2.5/13 — delivery

| PARAMETER | BEFORE TREATMENT | AFTER TREATMENT | CHANGE |
|---|---|---|---|
| Receiver fill time from 2 to 7 kgf/cm² | **4 min 10 s** | **3 min 25 s** | **45 s** |

Compressor output is inverse to the fill time: a reduction of 45 seconds corresponds to a 22 % gain in delivery.

## Hydrogen compressor of the Hydrogenation Plant

| PARAMETER | BEFORE TREATMENT | AFTER TREATMENT | CHANGE |
|---|---|---|---|
| Operating temperature at a discharge pressure of 1.5 kgf/cm² | **95 °C** | **85 °C** | **10 °C** |

The act takes the operating temperature as the principal indicator of this compressor's technical condition; the repeat measurement was taken after 42 hours of operation.

# What the plant's acts recorded

The ammonia compressors came to the treatment worn out: XADO technology was applied because of "increased oil consumption due to heavy wear of the crank-and-connecting-rod mechanism and the cylinder-piston group". After **32 hours** of operation of the compressors treated with the XADO compound, "oil consumption decreased and was subsequently eliminated completely". After the second stage of treatment the plant noted "a significant reduction of the oil temperature in the system, a reduction of vibration and, as a consequence, a reduction of the operating noise of the compressors restored with the XADO compound". In figures it looks as follows: the air compressors fill the receiver **45 seconds** faster, and the operating temperature of the hydrogen compressor dropped **95 → 85 °C** — and this with no unit disassembled and no production stoppage.

XADO

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The results relate to the compressor facility of «MZhK Khabarovskii» JSC — the NF-611 ammonia compressors, the 2VU1-2.5/13 air compressors and the hydrogen compressor of the Hydrogenation Plant; on other equipment and under other operating modes the figures may differ. The originals of the acts of 8 and 30 January 2002 with signatures and stamps are published in full and available for download.