

TESTING LABORATORY

E.O. Paton Electric Welding Institute of the National Academy of Sciences of Ukraine, (PWI).
Postal address: 11, Kazymyr Malevych St., Kyiv, 03150, Ukraine.
Accreditation certificate No. 20362 dated April 3, 2020.

APPROVED

Deputy Director of the E. O. Paton EWI
Academician of NASU

Leonid Lobanov

2022

TEST REPORT No. 275/10-22. (Hydraulic burst test report of gas cylinders).

1 Characteristics and purpose of product sample, services, technical process (name with indication of ND for products).

Hydraulic static pressure tests until failure of the new metal-composite gas cylinder model CRPIII -106-3.0-30-T manufactured by Liaoning Alsafe Technology Co., Ltd.
Serial number: WF 14020. MFG date: 2021.09. MFG STANDARD: EN 12245.
The sample was delivered by the Customer.
(Nominal internal volume 3.0 l, weight 2.1 kgf, working pressure 300 bar. Hydraulic test pressure 450 bar)

2. Test customer and his address.

Entrepreneur: Valentyn Sypavin
63505 Kharkiv Oblast, Chuguiv city, Shevchenko str., building 25.

3. Letter/agreement/decision: Agreement No. 721 dated September 12, 2022.

4. Date of receiving the sample: September 12, 2022.

5. Date of tests: September 29, 2022 - October 06, 2022.

6. Place of testing: Kyiv, E. O. Paton Electric Welding Institute of the National Academy of Sciences of Ukraine, (PWI).

7. Test methods or procedures (Nos. of ND paragraphs or No. of document)

Hydraulic tests according to DNAOP 0.00-1.07-94 , GOST 15586-93, DSTU 3245-95, EN 12245 in order to determine the bursting pressure, location and cylinder destruction characteristics.

8. Means of testing and measuring equipment (name, type, number, accuracy of measurements, number and date of the verification/calibration certificate):

- "Hofer" pump, inv. No. 4204;
- pressure sensor MIDA-DI-13P, 0-160 MPa, 0.5, No. 14421165, ± 0.8 MPa, (calibration certificate No. 05/4406 K dated October 12, 2021);
- tape measure 10 m, P10UZK No. 10. DSTU 4179-2003, (with calibration certificate UA /23/211025/002948 dated October 25, 2021);
- calipers IDF 0.05, No. 23, (with calibration certificate UA /23/211025/002934 dated October 25, 2021);
- ruler 500 mm. DSTU GOST 427:2009, No. 11, (with calibration certificate UA /23/211025/002949 dated October 25, 2020);

9. Test conditions: normal climatic conditions (NCC), water temperature not lower than 15 °C.

10. Results of cylinder actual parameters control:

diameter 112.3 ± 0.5 mm, internal volume 3.1 ± 0.1 l, weight 1.96 ± 0.05 kgf.

11. Results of the preliminary visual inspection: no significant remarks.

12. Test results. *

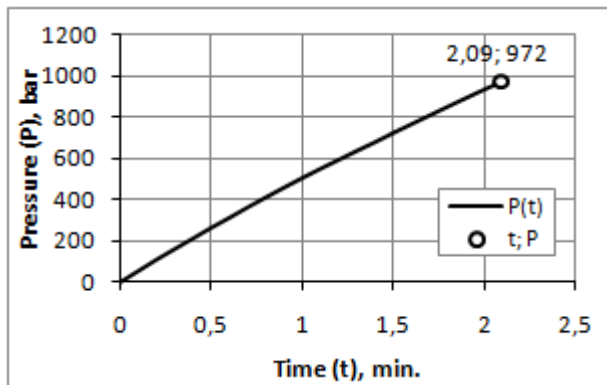
The pressure in the cylinder was increased with a step of 50...100 bar. Load rate 9.0...6.4 bar/s. At each stage there was a hold under pressure for at least two minutes. After loads of 554 and 815 bar the cylinder was kept under pressure of 508 and 526 bar for more than 18 hours. After the exposure, pressure drop and volume change, deformations in the circular and longitudinal directions were not detected.

After a load of 911.8 bar, cracks in the lacquer coating in the circular direction were recorded on the cylindrical part of the cylinder.

The cylinder collapsed in the cylindrical part in the longitudinal direction, with plastic deformation of the aluminum liner in the zone of destruction. The destruction took place without debris. Actual burst pressure: 972 bar.

After internal pressure tests:

- residual average ring deformation < 0.20 %;
- residual average longitudinal deformation < 0.36 %;
- residual volume change of the cylinder is approximately 32 cm³;
- no remarks on the thread in the neck, on the neck and the bottom.



General diagram of internal pressure load before failure.



Photo of cylinder WF 14020 after the tests.

13. Detected failures (malfunctions): no equipment failures occurred during the tests.

14 General conclusions.**

The cylinder burst pressure is 972 bar. Cylinder WF 14020 meets the requirements EN 12245 regarding the results of hydrostatic pressure tests until the failure of new gas cylinders.

Head of Department No. 12, Doctor of Science

Vasyl Torop

Head of the group "Pressure test" Oleksandr Paliienko _____ (signature) _____ 2022.	Responsible for conducting tests and preparing a test report Roman Dmytrienko _____ (signature) October 18, 2022 phone: +38 044 205-23-79, +380688579600 dri1@ukr.net www.dri1.cc.ua
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* The test report refers only to the tested samples.

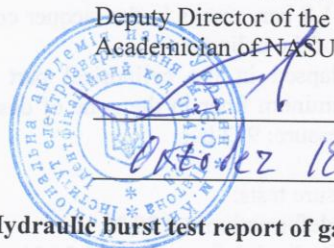
** Reprinting of the protocol (full or partial) without the permission of the testing laboratory is prohibited.

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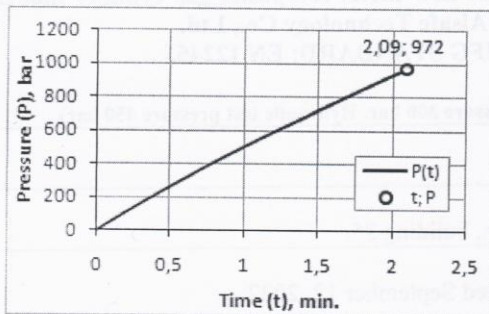
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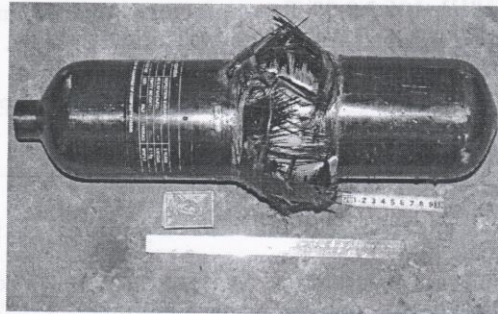


Photo of cylinder WF 14020 after the tests.


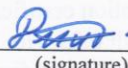
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