Measuring
people's
safety

second
breath

FASTER
MORE FLEXIBLE
EASIER

TEST EQUIPMENT
FOR THE RESPIRATORY
PROTECTIVE DEVICES

About company

SECOND BREATH OÜ is a research and manufacturing company based in Estonia whose subject of activity is innovative lab equipment and software for testing and quality control of all types of RPE, monitoring the physiological parameters of human breathing.

Our products are recommended for:

- **RPE** developers and manufacturers
- **CERTIFICATION** bodies and testing laboratories
- **RESEARCH** centers and universities
- **MINING** industry

- **FILTERING DEVICES**
- **BREATHING APPARATUSES**
- **LIFE SUPPORT SYSTEM**

Since 2024 we are members of the International Society for Respiratory Protection (ISRP)

About company

5+ YEARS

of experience in own production of test equipment for RPE

25+ YEARS

of experience of the company's employees in RPE research and development

20+ EMPLOYEES

in our team including engineers, designers, programmers, brand manager, customer service and sales managers

14 SERIAL TEST EQUIPMENT

in the product line

70% OF EXPERTS

have a scientific degree in engineering and IT

6 NEW PRODUCTS

planned for release in 2024

How we manufacture test equipment

Market, customer requests analysis

R&D work

Components selection from the world's best manufacturers

Own unique hardware and software parts development

Testing and internal quality control

Certification and obtaining a patent for innovative technologies

Market launch and direct sales

SECOND BREATH OÜ and mining industry

20+ YEARS

our main engineer has experience in research and development SCSR

Metabolic breathing simulator OXY ROBOT

- for testing SCSR
- for incoming and periodic inspection
- for annual monitoring SCSR program

is the first equipment we produced

Mobile breath recorder

for testing SCSR with volunteer person

is unique device which has no analog in the world

Recommended for:

- developers and manufacturers SCSRs
- mining companies and mine rescue teams
- scientific and technology research and control organization and lab

Test equipment for breathing apparatuses and life support systems

OXY ROBOT
metabolic breathing simulator

OXY ROBOT
pressure breathing simulator

MOBILE BREATH RECORDER

PULSAR
breathing machine

OLYMPUS
pressure breathing machine

DUMMY HUMAN HEAD

Test equipment for filtering devices

BOREAS
measuring breathing resistance

PULSAR
breathing machine

OLYMPUS
pressure breathing machine

DIOXIDE
measuring CO_2 content in the «dead space»

MONOXIDE
measuring CO content in inhaled air

DOLOMITE
measuring filters resistance to dolomite dust clogging

SILICA DUST
measuring filters resistance to silica dust clogging

DYNAMICS
evaluation of gas, vapor and combined filters capacity

DUMMY HUMAN HEAD
testing different facepieces

SALT MIST
measuring total inward leakage (TIL) with using NaCl aerosol

ELEGAS
measuring total inward leakage (TIL) with using SF_6

SECOND BREATH OÜ test equipment features:

WE

- test equipment comes to working mode fast
- test equipment have a high level of process automation and do not require constant staff involvement

WE

- test parameters can be flexibly changed* in the test equipment software via an application on a personal computer

** within technical possibilities*

WE

- test equipment have a simple and convenient interface to control

WE

- test equipment have lightened design

YOU

- can carry out more tests per day
- increase your productivity
- do other important work task at the same time

YOU

- not have to change all or part of the test equipment if industrial standards are updated or new one release, or if you carry out research tests

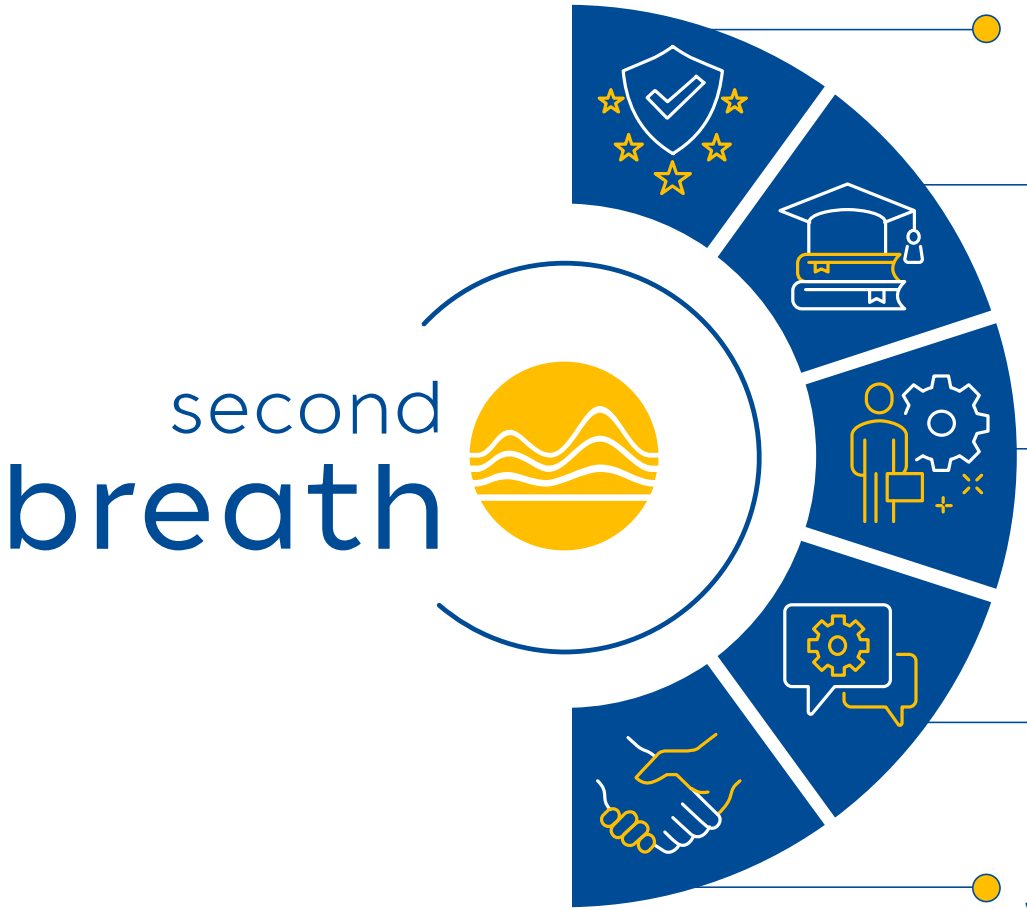
YOU

- get minimum manual switching
- can quickly and easily master the control of the test equipment and involve even a laboratory intern in the work

YOU

- get attractive laboratory and additional inspiration to design RPE

About service

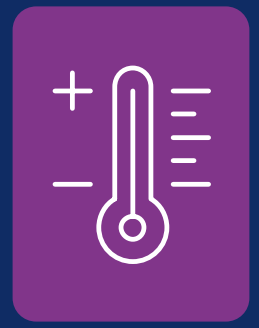


- Warranty from 12 month
- Training of the customer’s staff
- Personal service manager
- Service support for the entire period of use
- Development of equipment according to your terms of reference

Below you will take a closer look at our equipment, but first, remember a few icons that will help you to navigate

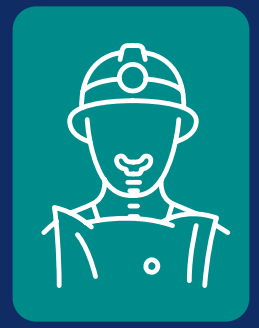
for testing breathing apparatuses

for testing filtering devices



work in a climate chamber

work in conditions of low or high atmospheric pressure



testing with volunteer person

Human breathing simulation

Flagship product

OXY ROBOT
metabolic breathing simulator

recreate human inhale and exhale with necessary humidity and temperature, the exchange of gasses: O_2 consumption, CO_2 release; reproduce breathing according to prerecorded breathing curve of a real person at different loads.
Can be completed with a pumped or heated dummy human head or tee.

APPLICATION:
SCBA, Airline BA, SCSR on chemically bonded or compressed oxygen, EBA, life support systems, CCR, SCUBA

RELEVANT STANDARDS*:
ISO 16900-5:2016(E), EN 401, EN 14143 and others*

Watch clip

OXY ROBOT
pressure breathing simulator

suitable for tests in conditions of ambient pressure difference (6 atm).
Design with cylinders

Controlled via touch-screen display

Testing breathing apparatuses with persons

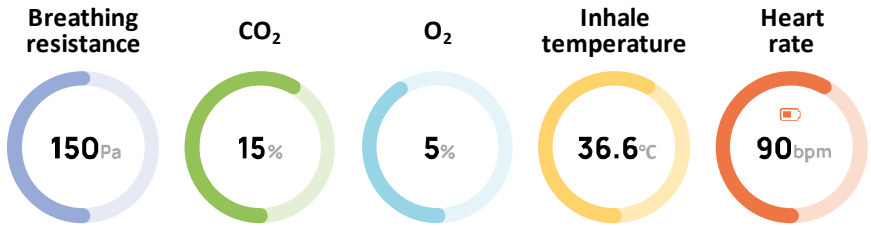
MOBILE BREATH RECORDER test equipment

Complements the testing program conducted with Metabolic breathing simulator OXY ROBOT

a portable wireless device and software that is connected to a real RPE and records the parameters of a person's breathing in it under various loads and climatic conditions (up -40 to 40 C°).

the load during testing process. You can create an exercise program for testing and find out the breathing parameters at the time of these loads from the report.

MEASUREMENT PARAMETERS:



Watch clip

If you interest in this products, send your request on info@second-breath.ee to get the datasheet

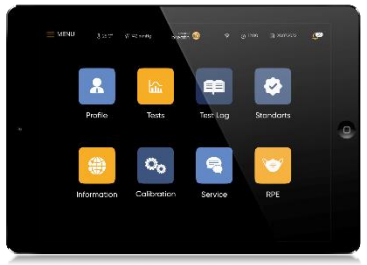
Lung ventilation simulation

Artificial lungs

PULSAR
breathing machine

suitable for tests at normal atmospheric pressure. Design with bellow pumps

create a pulsating air flow that imitates human breathing with the required value of lung ventilation. Can be completed with a pumped or heated dummy human head.



Controlled by personal computer or smartphone via Bluetooth-chanel

OLYMPUS
pressure breathing machine

suitable for tests in conditions of ambient pressure difference. Design with cylinders

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Measuring breathing resistance

Test device BOREAS

creates a constant air flow through the RPE in the directions of «exhalation» and «inhalation» and measures the air pressure difference between the surrounding atmosphere and the mask space of the RPE, calculates the resistance to air flow.

APPLICATION:
RPE with full-face and half-mask; anti-aerosol, anti-gas and combined RPE with an insulating front part; filtering self-rescuer; RPE from radioactive substances.

RELEVANT STANDARDS*:
EN 136, EN 140, EN 143, EN 149, EN 405, EN 1827
and others...

Watch clip

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Evaluation of filters capacity using test agents

Test equipment DYNAMICS

Watch clip

prepares the gas-vapor-air mixture in accordance with the conditions for using the tested filter - the required temperature, relative humidity, concentration of the test agents and passes this mixture through the filter until the test agent is detected in the air sample at the outlet of the filter (breakthrough concentration) or until the filter protection time, which is set by the RPE manufacturer, expires.

APPLICATION:
gas, vapor and combined filters

RELEVANT STANDARDS*:
EN 136, EN 140, EN 143, EN 149, EN 405, EN 1827
and others...

Test different types of filters on the same test equipment. Configuration options for one test equipment design:

1) Dynamics G: up 2 to 8* test gases:

Cl_2	chlorine	C_2H_6O	dimethyl ether
NO_2	nitrogen dioxide	C_4H_{10}	isobutane
SO_2	sulfur dioxide	H_2S	hydrogen sulfide
NH_2	ammonia	NO	nitric oxide

2) Dynamics G2: 2* gases:

HCl	hydrogen chloride
AsH_3	arsenic hydrogen

* the number of test agents is determined by the customer

3) Dynamics V: up 1 to 4* vapors

C_6H_{12}	cyclohexane
HCN	hydrogen cyanide
C_3H_4O	acrolein
C_6H_6	benzene

4) Dynamics Hg

Hg	hydrargyrum

Controlled via personal computer (laptop)

If you interest in this products, send your request on info@second-breath.ee to get the datasheet

Measuring CO_2 and CO content in inhaled air

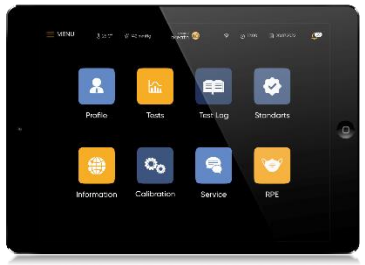
developed on OXY ROBOT breathing simulator hardware and software platform

DIOXIDE test equipment

creates a pulsating air flow that imitates human breathing with the necessary parameters of breathing frequency and depth and volume concentration of CO_2 on «exhalation» and measures CO_2 content in a mask “dead space”.

APPLICATION:
full-face masks, half-masks, quarter-face masks, masks with helmet or hood

RELEVANT STANDARDS*:
EN 1827, EN 12941, EN 136, EN 149, EN 403, EN 404, EN 405
and others…



Controlled via touch-screen display

Watch clip

Watch clip

creates a pulsating air flow that imitates human breathing with necessary parameters of breathing frequency and depth, temperature and relative humidity, creates a test atmosphere with necessary conditions — temperature, moisture content, volume of carbon monoxide (CO) and measures CO content that has passed through the filter of tested RPE in the required time.

APPLICATION:
filtering self-rescuers

RELEVANT STANDARDS*:
EN 403, EN 404
and others…

MONOXIDE test equipment

If you interest in this products, send your request on info@second-breath.ee to get the datasheet

Measuring dust clogging resistance

developed on OXY ROBOT breathing simulator hardware and software platform

DOLOMITE test equipment acc. to EN standards

Using test agent is dolomite dust

test equipment creates a special dust atmosphere and constant air flow in the test chamber for the tested respirator and the breathing machine simulates human breathing with necessary parameters of lung ventilation, humidity and temperature of exhalation. As a result of the test respirator resistance to constant airflow after clogging is determined. This time is compared with requirements of industry standards.

Controlled via personal computer (laptop)

SILICA DUST test equipment acc. to NIOSH standard

Using test agent is silica dust

APPLICATION:
respirators with anti aerosol
and combined filters

RELEVANT STANDARDS*:
EN 149, EN 143, EN 13274-8, EN 405,
EN 1827, EN 12941, EN 12942, EN 14387
and others...

Watch clip

Watch clip

APPLICATION:
HEPA filters designed for powered air-purifying respirators (PAPRs)

RELEVANT STANDARDS:
procedure № RCT-APR-STR-0025 NIOSH

If you interest in this products, send your request on info@second-breath.ee to get the datasheet

Measuring total inward leakage (TIL)

test RPE with persons

ELEGAS test equipment

Using test agent
is sulfur hexafluoride (SF6)

Watch clip

test equipment creates a special atmosphere with a test agent and determines the leakage of it under a mask bypassing a filter when a volunteer person is doing exercises in the tested RPE on the treadmill into the test chamber.

APPLICATION:
full face & half masks with aerosol filter, half masks with valves and non-removable gas or combined filter, filtering self-rescuers

RELEVANT STANDARDS*:
EN 149, EN 13274-8, EN 136,
EN 1827, EN 12941, EN 12942
and others...

Controlled via personal computer

SALT MIST test equipment

Using test agent
is sodium chloride aerosol (NaCl)

Watch clip

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Dummy human head

sold only as part of Oxy Robot, Pulsar, Olympus testing equipment

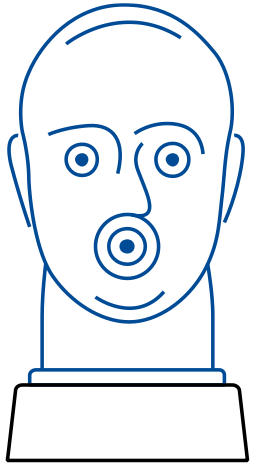
APPLICATION:

1. for testing various facepieces - full-face, half-face, with a valve, in the form of a hood
2. can be made in a heated version for climatic chambers (without inflation)

Small ISO size

Medium ISO size

Large ISO size



+ customization size is available too according to your 3D model

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How quickly SECOND BREATH OÜ test equipment reach* operating mode

Instantly	no more 10 min	no more 15 min	no more 20 min	no more 40 min	no more 60 min
PULSAR, OLYMPUS, BOREAS, MOBILE BREATH RECORDER	DIOXIDE	OXY ROBOT	DYNAMICS GAS, ELEGAS, SALT MIST	MONOXIDE	DYNAMICS VAPOR, DYNAMICS HYDRARGYRUM, DOLOMITE, SILICA DUST

** Time to reach the operating mode is the time interval after power supply is applied to the equipment, after which the specified technical characteristics required for testing must be achieved.*

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Address: Valge 13, 11415, Tallinn, Estonia
Phone & business WA: +37 269 807 09
E-mail: info@second-breath.ee
Web: www.second-breath.ee

STAY IN THE LOOP!

Linkedin: Second Breath OÜ
Youtube: @secondbreath5264

VIDEO PRESENTATION