

PAROC® PRO WIRED MAT LE

Thermal insulation for high temperature indoor industrial applications

BREATHE WITH EASE



UP TO
-90%
MONISOCYANATES
EMISSIONS¹

UP TO
-50%
FORMALDEHYDE
EMISSIONS¹

**LOWER VOC EMISSIONS
IMPROVED INDOOR AIR
QUALITY DURING FIRST HEAT-UP**



PAROC

INTRO

INSULATION FOR high temperature indoor industrial applications usually generates VOC emissions during the first heat-up.² But there is a possibility to reduce those emissions. The right insulation can make a big difference.

PAROC® PRO WIRED MAT LE is a thermal insulation specifically designed for indoor industrial high temperature applications. During first heat-up of indoor installation, it emits up to 50%¹ less formaldehyde and up to 90%¹ less monoisocyanates than traditional wired mat insulation.

REDUCING VOC EMISSIONS WITH PAROC® PRO WIRED MAT LE CAN RESULT IN:

- better working conditions.
- saving time and money by preventing longer shutdowns and reduction of efforts for preventive measures.
- improved air quality during first heat-up.

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BENEFITS

- Protection of staff during first heat-up
- Saving time and money

CONTACT US

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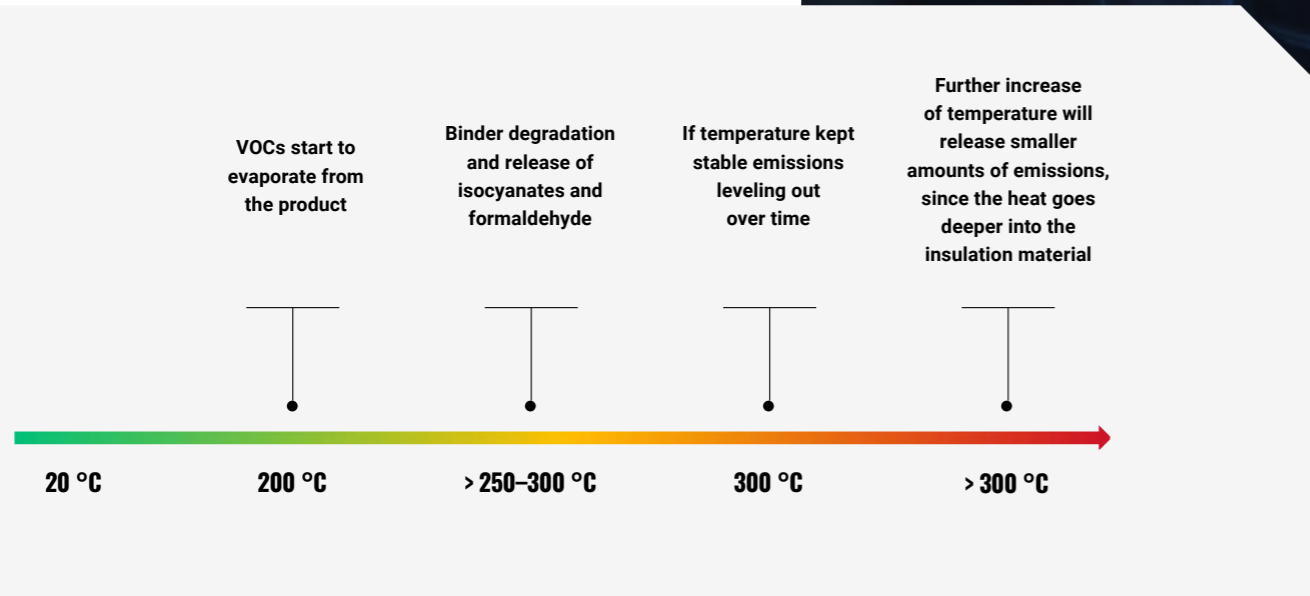
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PROBLEM

THE BINDER used in insulation products can create VOC emissions during the first heat-up.

- Many industrial plants are insulated with stone wool using urea-modified phenol-formaldehyde resin (PUF).
- At high temperatures above 200 °C, conventional binder usually decomposes and releases non-methane volatile organic compounds (VOC) like isocyanate and formaldehyde.
- Special measures need to be taken when stone wool on indoor applications is heated the first time, e.g. during start-up or after maintenance.



Every installation has its own characteristics:
 The amount of insulation being heated above the critical temperatures and speed of the released emissions of the binder depend on the specific situation in the plant

- Factors influencing the emissions in the air:**
- Volume of the facility
 - Air change rate in facility
 - Amount of insulation
 - Density and thickness
 - Temperature and time

SOLUTION

Paroc has developed a **NEW GENERATION OF BINDERS** based on renewable, biobased ingredients.

- The Low Emission Binder helps to release lower amounts of VOC emissions than standard products and thus can improve the indoor climate during first heat-up of an indoor installation.
- PAROC® Pro Wired Mat LE utilizes our **NEW LOW EMISSION BINDER** and is specifically designed for high temperature industrial indoor applications.

HASSLE-FREE and clean handling with minimal dust and loose fibers.

OPTIMAL FOR use in thermal insulation of high temperature applications.

OFFERS FORM stability⁴, even with long time use at high temperatures, e.g. for maintenance.

NON-COMBUSTIBLE³, heavy-duty stone wool mat for industrial applications.

CAN CONTRIBUTE to an improved indoor climate during and after the heat-up of a plant and/or maintenance of equipment.

PAROC® PRO WIRED MAT LE IS OFFERED IN A RANGE OF SIZES, DENSITIES AND FACING MATERIALS TO ACCOMMODATE DIVERSE REQUIREMENTS.

[SEE FULL TECHNICAL DETAILS](#)



PROOF POINTS

HOW DOES the new binder affect the VOC emissions of stone wool insulation during first heat-up?

COMPARATIVE THIRD party laboratory tests show that PAROC® Pro Wired Mat LE offers lower monoisocyanates and formaldehyde emissions compared to known competing stone wool products.

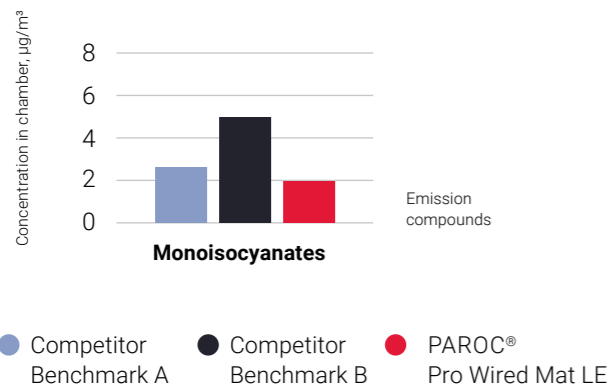
LAB-TESTED⁵

UP TO
-90%
MONOISOCYANATES
EMISSIONS¹

UP TO
-50%
FORMALDEHYDE
EMISSIONS¹

PAROC® PRO WIRED MAT LE VS KNOWN COMPETING STONE WOOL PRODUCTS

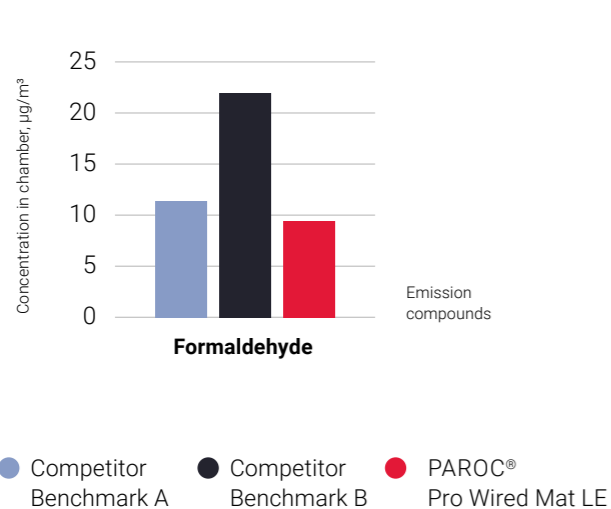
Benchmarks A and B vs PAROC® Pro Wired Mat LE



**-30%
to
-59%**

MONOISOCYANATES⁶

Benchmarks A and B vs PAROC® Pro Wired Mat LE



**-15%
to
-57%**

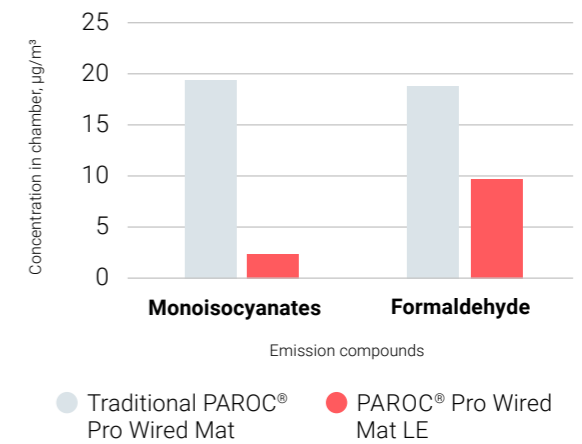
FORMALDEHYDE⁶

PAROC® PRO WIRED MAT LE PROVIDES ONE OF THE LOWEST EMISSIONS AVAILABLE FOR STONE WOOL INSULATION PRODUCTS.⁶

TRADITIONAL PAROC® PRO WIRED MAT VS PAROC® PRO WIRED MAT LE

Third party comparative laboratory tests demonstrate significant differences in emissions.

Traditional PAROC® Pro Wired Mat vs PAROC® Pro Wired Mat LE



Sample test in emission chamber at 300°C

WHEN STONE WOOL insulation is heated the first time to a temperature above 200 °C, the binder starts to decompose. Typically thermal breakdown products are e.g. monoisocyanates and formaldehyde. PAROC® Pro Wired Mat LE products can be used in facilities requiring lower emission levels of formaldehydes and monoisocyanate components.

TESTS VS COMPETING LE PRODUCTS

TEST VS TRADITIONAL PRODUCT

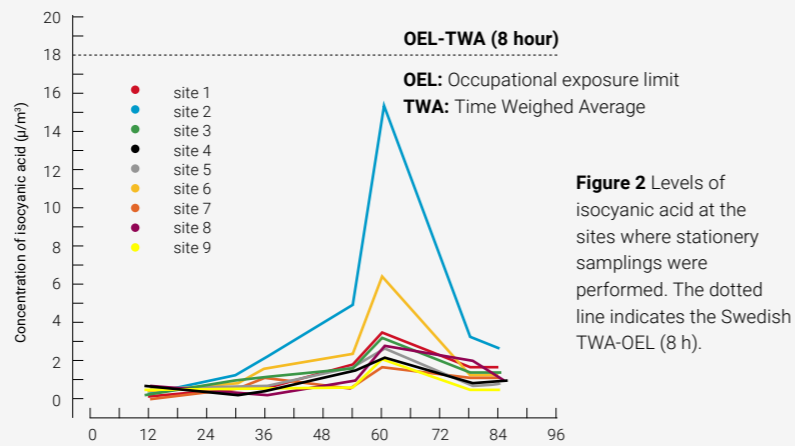
PROOF POINTS

FIELD TESTS conducted in Sweden show that PAROC® Pro Wired Mat LE omitted isocyanate emissions well below the national Occupational Exposure Limit OEL.



STATIONARY SAMPLING

- **THE AIR FLOW IN THE PLANT** was from the bottom to the top of the building.
- **SITE 1, 2, 3** and 4 were on the highest floor and site 2 was selected as being a suspected "hot spot".
- **SITE 5-9** were in the lower part of the building.
- **AFTER 60 H** the furnace core had reached a temperature of 720 °C and the parts insulated 350-380 °C. Site 2 significantly higher.



PERSONAL SAMPLING

OEL-TWA = 18 µG/M3

DAY	Time since start of furnace (h)	Operator	Sampling time (minutes)	Concentration of ICA (µg/m³)
2	30-363	1	119	0.81
2	30-36	2	119	0.46
3	54-50	3	74	0.75
3	54-60	4	74	0.86
4	78-84	2	91	0.81

Total of two samplings each day, one in the morning and one in the afternoon.

“THE PERSONAL SAMPLINGS REVEALED THAT THE CONCENTRATION OF ICA NEVER EXCEEDED 1 µg/m³.”

Assessment by Occupational and Environmental Medicine

Setup and conditions

Two different density products were installed on a boiler at customer site:

- 486 m² Paroc PRO Wired Mat LE 100 (100mm)
- 135 m² Paroc PRO Wired Mat LE 80 (100mm)
- 62.1 m³ new insulation with a mass of 5.9 metric tons

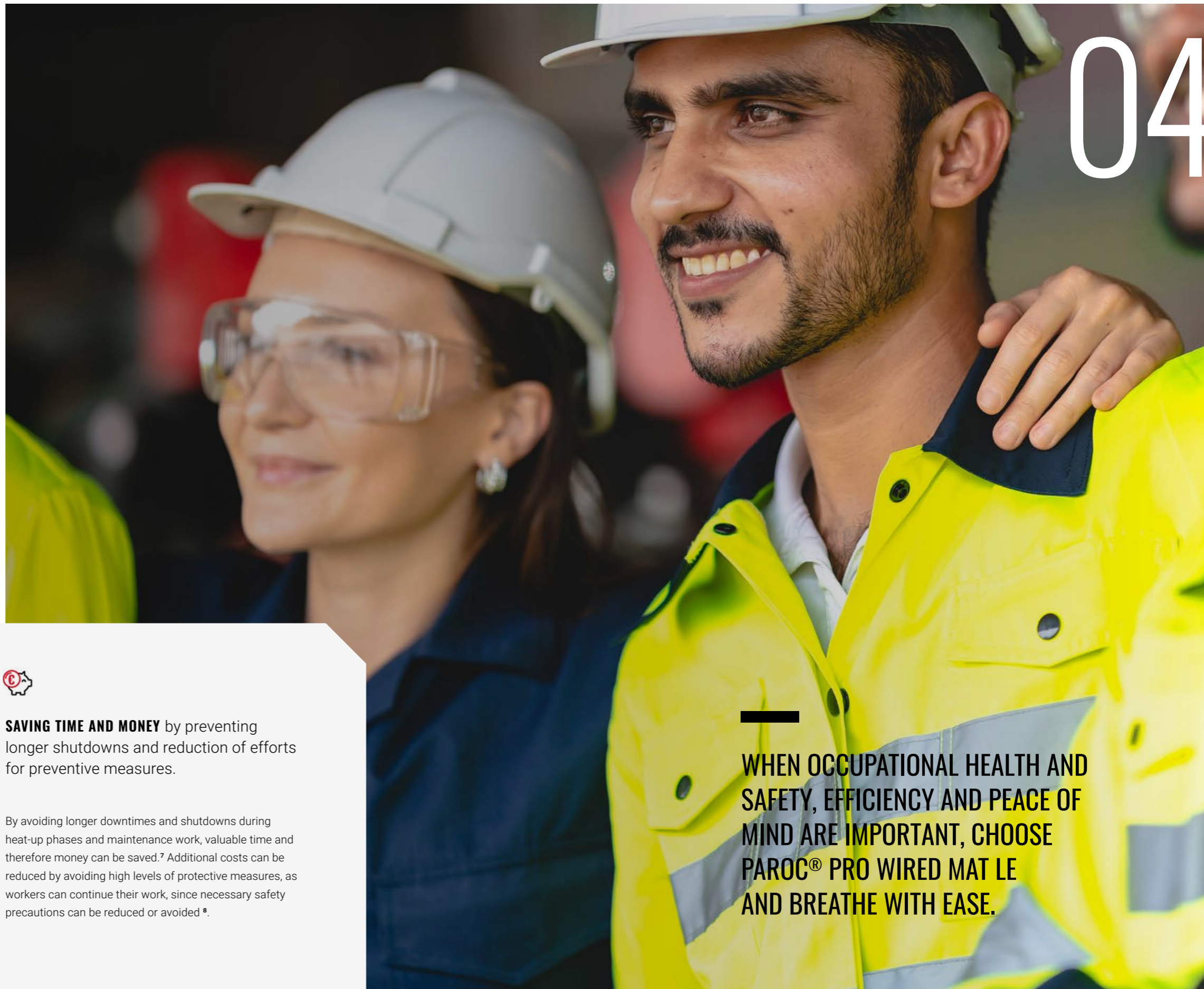
- Air measurements at the start-up were conducted by occupational and environmental medicine, Linköping University Hospital, Sweden.
- Stationary sampling was performed at 9 different spots around the newly installed wool.
- Personal samplers were mounted near the breathing zone (< 30 cm from the mouth/nose) of the operators and emissions were collected while work with the stationary stations were done.
- Sampling of emissions was done 12-84 h after the heating of the boiler had started.



BENEFITS: BREATHE WITH EASE

 **PROTECTION OF STAFF**

 **SAVING TIME AND MONEY**



PROTECTION OF STAFF during first heat-up by minimizing health risks for workers and releasing less odor.

Low levels of emissions ensure a good working environment and improve indoor climate. During the first heat-up of insulation wool, health risks are reduced. It becomes easier to comply with national Occupational Exposure Limits (OEL) of the substances like isocyanates. This can lead to a reduction of preventive measures at the workplace like exposure monitoring, costly ventilation systems or personal respiratory protection. Also, the reduced odor of the PAROC® Pro Wired Mat LE makes installation much more pleasant.



SAVING TIME AND MONEY by preventing longer shutdowns and reduction of efforts for preventive measures.

By avoiding longer downtimes and shutdowns during heat-up phases and maintenance work, valuable time and therefore money can be saved.⁷ Additional costs can be reduced by avoiding high levels of protective measures, as workers can continue their work, since necessary safety precautions can be reduced or avoided ⁸.

WHEN OCCUPATIONAL HEALTH AND SAFETY, EFFICIENCY AND PEACE OF MIND ARE IMPORTANT, CHOOSE PAROC® PRO WIRED MAT LE AND BREATHE WITH EASE.

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Notes

- ¹ Comparative laboratory test of traditional PAROC® Pro Wired Mat and PAROC® Pro Wired Mat LE, conducted by Linköping University Hospital, Sweden. A sample was heated in a 4.75 m³ chamber to 300 °C. 2024_04 Linköping report. Recommended for operating temperatures of 200°C and above.
- ² Not only from the insulation material itself.
- ³ Find details in Product Declaration of Performance.
- ⁴ Find details in Product Declaration of Performance. MST (Max Service Temp) covers high temp dimensional stability.

- ⁵ Sample was heated in a 4.75 m³ chamber to 300 °C.
- ⁶ Compared to two known competitor products with declared lower emissions of formaldehyde and isocyanates.
- ⁷ The amount of insulation being heated above the critical temperatures and speed of the released emissions of the binder depend on the specific situation in the plant.
- ⁸ Avoidance or reduction of safety precautions needs to be validated by an emission test or analysis.