

WORLD OF COOLING®



10%

More performance on hot days.
More concentration – less accidents.



5s ...and up to 12° cooler



MORE PERFORMANCE & HEALTH BY COOLING

HEAT STRESS - A RISK OF HEALTH & SAFETY



More than 3 millions of people suffer from heat stress at their workplace only in Germany*. Worldwide high temperatures are a problem which even increases due to climate change.

This results in a lower performance rate, worse concentration capabilities and may endanger security and health of workers.

Heat problems arise especially when people work physically, wear protection clothes or when temperatures rise over 26°C (78,8 °F)

To guarantee that all processes in the human body work in a sufficient way, the body needs more than 80% of the energy only to regulate and keep his body temperature near 37°C (98,2 °F)

HEAT STRESS → Exhaustion, Heat cramps, Heat collapse

In a study initiated by the Baden-Württemberg Ministry of the Interior, Germany, it was proven that with protection clothes in high temperatures there is an enormous fluid loss, the body temperature rises up to 39°C (102,2°F) „fever temperatures“, lactate data was much higher than normal and the heart rate was much too long over the maximum recommended result.

Furthermore the high energy consumption for the thermoregulation of the body leads to exhaustion and in worst cases to heat cramps or heat collapse. A danger for security and health!

HEAT STRESS → Higher rate of sick leave

Furthermore the risk of problems with the cardiac system, metabolic diseases and skin problems is increasing. Often this leads to a higher number of people on sick leave and more people who will retire earlier. Besides a higher health risk and lower life age of the workers affected can also lead to a bottleneck of human resources also because of the demographic situation in a lot of countries.

Consequences of heat stress

- Risk of health damage
- Lower concentration
- Lower performance
- Higher risk of accidents

Exhaustion
Heat cramps
Heat collapse

- Danger of cardiac- and metabolic diseases
- Skin problems

RISK OF HEALTH DAMAGE ON THE LONG RUN!

* source: Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA)

HEAT – A RISK FOR HEALTH AND SAFETY

WHAT CAN BE DONE?

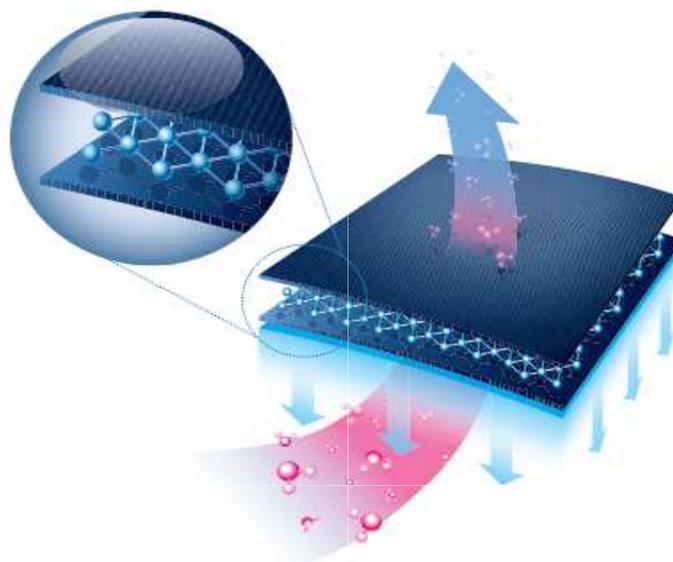
Working conditions can mostly not be changed and compulsory protective clothing often aggravates heat stress. In addition according to scientific studies potential aggressive behavior of workers often increases in high temperatures and further reduces work processes and productivity. Together with less concentration and performance the productivity decreases by 12% on hot days according to German IfW* (Kiel). A value which requires preventive action in the form of cooling not only from a medical but also from an economic point of view.

*Kiel Institute for the world economy

Therefore, the decisive question is:

How can body parameters be improved and will this improvement reduce health risks, exhaustion, accidents and sick leave?

THE E.COOLINE COOLING SYSTEM HELPS



The E.COOLINE high-tech fleece is able to store water in a couple of seconds. The water stored evaporates at elevated ambient temperatures or increasing skin temperature and thus cools the body.

The E.COOLINE cooling system provides functional textiles with an active cooling technology, which significantly reduce heat stress and increase concentration and performance at the workplace – even under protective clothing.

E.COOLINE REDUCES HEALTH RISKS CAUSED BY HIGH TEMPERATURES!

MEDICAL CARE BY COOLING

HOW DOES E.COOLINE® WORK?

The product reacts similar as the human body which stabilizes its temperature by cooling which is produced on the skin by evaporation of sweat. The effect and sustainability are however much higher because the 3D-Hightech Fleece in E.COOLINE is able to bind and hold 10 times its own weight in 5-10 seconds. No drops - water is only released by cooling evaporation and cools the body in a natural and individual way:



More cooling in high and less cooling in low temperatures.

No excessive cooling occurs. Your body is only cooled to the degree needed and the cooling intensity adjusts to ambient temperatures. After a certain time, you will no longer perceive the cooling effect as your body is „air-conditioned“. **You transpire less and provide release for your cardiovascular and metabolic systems as well as your energy balance.**

Depending on ambient and body temperatures, the cooling effect lasts up to 20 hours, your body and clothing stay dry.

Therefore, E.COOLINE functional clothing can just be worn on top of normal clothing. If you require protective clothing, E.COOLINE must be worn underneath.



THERMAL IMAGING CONFIRMS:



Ø29,3°C *
with cooling of E.COOLINE



Ø 35,9°C *
without cooling

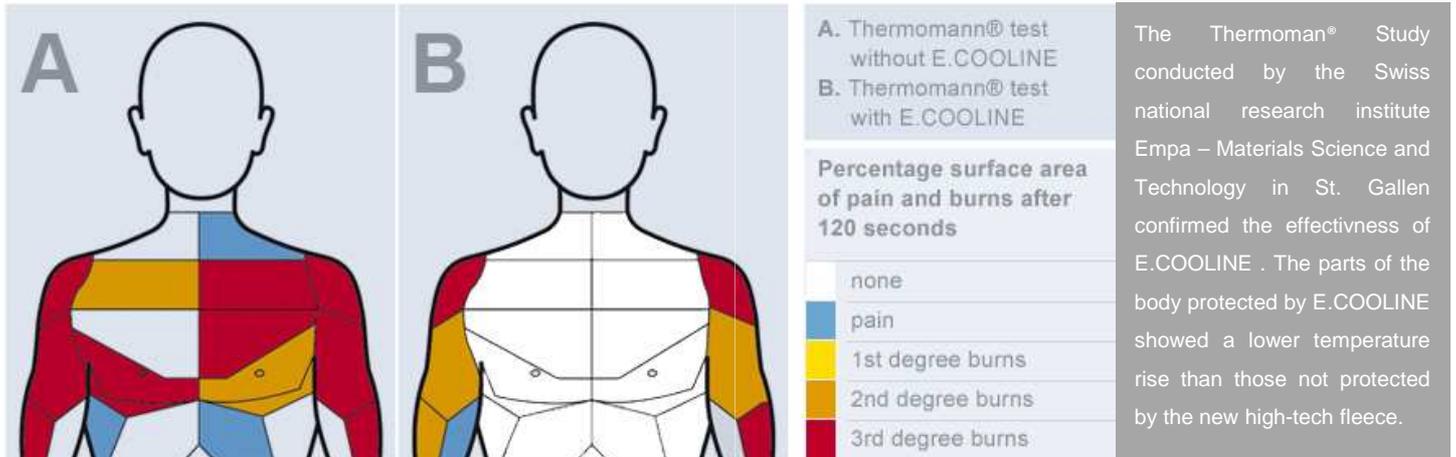
The temperature of the body surface* of the test persons was kept in a physiological range (28-32°C) by the use of E.COOLINE® cooling products (vest & headgear).

Did you know that a temperature of 36°C represents a critical risk for the skin? It may cause skin damages. Therefore, high temperatures are one of the main reasons for skin problems at the workplace. → Protect your skin by cooling!



**PERSONAL
COOLING SYSTEM**

MEDICAL CARE BY COOLING



Empa study report no 204 959/2.2.2006

CONFIRMED BY STUDIES

E.COOLINE functional clothing is able to cool the human body in a simple and physiological way for hours depending on ambient and body temperatures.

The individual active cooling effect is based on the physical principle of evaporation.

The cooling effect of the E.COOLINE technology is confirmed by the Thermoman study of the Swiss National Research Institute Empa – Materials Science and Technology in St. Gallen.

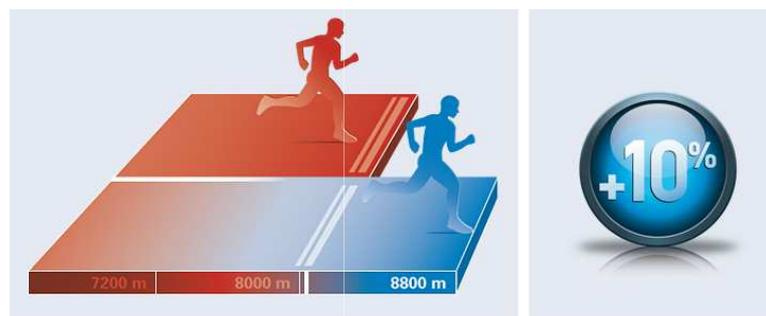
The temperatures determined on the „Thermoman“ surface („skin“) at a heat radiation of 5kW/qm lay by 3.4° C lower than without cooling vest. At 10kW/qm, the difference even amounted to 6.6°C.

An additional in-vitro thermokinetic study carried out in a laboratory test on the hightech material confirmed at 24°C a temperature reduction on the surface by 6°C to 18°C. While outside temperatures achieved 30°C, the temperature of the material stayed at cool 16°C.

Increase in performance of up to 10%

Studies carried out by the Universities of Munster and Dortmund confirmed a lower heart rate and better lactate values by E.COOLINE.

During one hour of activity at 30°C outside temperature, the test persons could use the energy saved by cooling for an increased performance of up to 10%.



*Thermo-Man is a trademark of DUPONT



**PERSONAL
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MEDICAL CARE BY COOLING

Additional benefits of the E.COOLINE® cooling system

Sometimes, in extreme situations with completely airtight clothing or more than 90% of humidity, the physical effect of evaporation of E.COOLINE might not work sufficiently enough over a longer period of time.

But also in these situations E.COOLINE can be used to cool the body for better performance and health.

Scientific studies analysed the cooling efficiency of E.COOLINE in the fields of PRE COOLING, INTER COOLING and POST COOLING. The values for lactate, body temperature and energy saving ($VO_2\max$) were significantly better.



What does this imply for practical application?

When it is not possible to apply E.COOLINE functional textiles during work or if the cooling effect is not sufficient, a minimum 20-minute-cooling prior to activities (PRECOOLING) and/or cooling during breaks (INTERCOOLING) and after activities (POSTCOOLING) can also significantly improve body parameters and health.

How is E.COOLINE used in more than 90% humidity?

Even in these situations E.COOLINE tops other cooling systems. Due to its 3-dimensional structure, water is structurally bound in the material in a way that lower temperatures of 10- 15°C on the material are achieved much faster than with other materials, such as gel packs, crystals, ice, etc.

Already after 30 min. in the fridge or cooling box with crushed ice bags or ice packs, the temperature of the E.COOLINE products activated with water is reduced to about 10-15°C. This temperature is achieved much faster and lasts two times longer than with other cooling materials also due to the synergistic effect of evaporative cooling. Thus, cooling is also guaranteed at humidities exceeding 90% and more. The COOL TO GO System (CTG) of E.COOLINE keeps you cool and mobile for hours even in extreme situations. Ask us for more information!

Did you know, that the physiological cooling temperature of the body should not permanently drop below 10°C because muscles and lymphatic system could be impaired? Therefore never let E.COOLINE products freeze and never use ice packs or other products with freezing temperatures below 10°C for cooling. Save your health!



**PERSONAL
COOLING SYSTEM**

MEDICAL CARE BY COOLING

HANDLING INSTRUCTIONS

Handling is quite easy.

Immerse E.COOLINE products in a sufficient quantity of water for about 5 to 10 seconds (cf. instructions of use). Subsequently press to squeeze water out and roll up in a towel.

Ready!

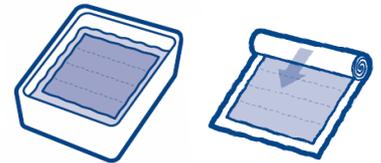
The products are immediately ready for use and cool for up to 20 hours.

1. Immerse E.COOLINE products completely in water to saturate consistently.
■ You may also use a water bottle or simply water of the tap or shower.



2. Remove, press slightly to squeeze water out and roll into a towel if there is residual moisture.

3. E.COOLINE products are usually ready for use. The outer layer should be air-dried if necessary.



CORRECT CARE

Dry cleaning (P) recommended. Handwash best with pH neutral liquid washing agent (e.g. Woolite®) and rinse thoroughly with clear water.

For machine wash (30°C) select program for wool/delicate wash or functional textiles and **do not** tumble.

No fabric softener, no tumbling or dry tumbling.

Ask us for washing instructions of industrial clothing.

Complete drying: Hang to dry for 1 - 3 days.



IMPORTANT NOTICE

Do not store the water-activated products in closed containers, bags etc.!

Please note that high humidity or airtight clothing can reduce the cooling effect of E.COOLINE. If this occurs, remove product for a few minutes and put back on or use the CTG (COOL TO GO) -System. This will result in re-activating the cooling capabilities. Wear the E.COOLINE cooling system directly under the outer protective clothing, on top of all other garments.

Ask us if you would like to disinfect the E.COOLINE products. We are able to provide a solution also for this reason.

For industrial use we can provide a fully automatic activation system for E.COOLINE. The COOLBOXX® Activation Tower offers enough space for up to 40 vests. **More information on request.**

ClimatePartner^o
climate neutral

Textiles | ID: 53721-1310-1001



United Nations Global Compact



SENAT DER
WIRTSCHAFT
Global Economic Network Sektion Deutschland e.V.



WELT WALD KLIMA
WORLD FOREST FOUNDATION

E.COOLINE is first in the world to provide climate neutral protective work clothing and we are member of the Caring for climate initiative of the UN Global compact, the Global Economic Network and we support the world forest foundation initiative.

Welcome!

performance international GmbH

Mühlsteige 13

fon. +49 731 14 071-0 · fax +49 731 14 071-14

info@performance.de · www.e-cooline.de

Customer service

Monday till Friday 8.00 - 18.00

Some of our clients:

Federal Police
Aviation Group



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BASF
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**LION
APPAREL**

Deutscher
Leichtathletik-
Verband
DLV

SCHWENK
Baustoffe fürs Leben

cooline inside

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