

TRO

life

magazine oct/2013

Hospital air.

The healing effect of efficient ventilation.

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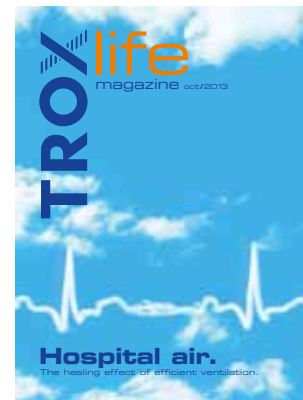
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humour

Laughter is the best medicine.

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viewpoint

Good air, speedy recovery.

For us climate experts hospitals are a most complex and difficult field as in the highly sensitive areas of healthcare, more than anywhere else, hygiene and safety must meet particularly stringent requirements. It is an undisputed fact that good room air quality helps patients to recover in much less time.

This issue of TROX life tells you about important facts relating to the ventilation and air conditioning in hospitals. You may think that health is a rather serious and dry subject with no room for entertainment. Far from it. Learn about fascinating facts regarding the placebo effect – you might be in for a surprise. Accompany us on a stroll through the history of medicine or read our interview of some extraordinary human beings who make a truly outstanding effort to help others in despair.

Insiders with a more technical interest will like our economy section. The captivating article deals with energy contracting and shows that the refurbishment of hospitals offers a huge potential.

Independent studies by the Energy committee of the German BUND (Association for Environment and Nature) indicate that hospitals in Germany could save approximately 600 million euros in energy costs while avoiding an annual 6 million tons of hazardous carbon monoxide.

Of course there is also room for humour in our magazine. Everybody knows that laughter is the best medicine. Have you ever heard of gelotology? No? It is derived from the Greek word γέλως gélōs, meaning laughter, and deals with the scientific research and healing effect of laughing.

Enjoy our magazine. We do hope that you always find plenty to laugh about. Laughing is good – good for your health.

Lutz Reuter
Chairman of the Board of Management of TROX GmbH



Healthy climate.

Stringent conditions
for hygiene and safety.

Healthcare is a highly sensitive field. Small wonder, then, that hygiene and safety must meet the most critical requirements.



High demands on room air conditioning.

Air conditioning systems in hospitals must ensure that the contamination of air with micro-organisms is reduced to a minimum and that tight limits are not exceeded. Moreover, dust, anaesthetic gases and odorous substances must be contained. This applies in particular to operating theatres, intensive care units, and maternity wards including delivery rooms and neonatal units.

Essentially, ventilation and smoke extract technology must achieve the following vital goals:

- Minimise the level of micro-organisms in the air, particularly in protection zones (operating table, instrument trolley, lab)
- Ensure the necessary air change and maintain stringent room air conditions (differential pressure, temperature and humidity)
- Limit the concentration of various substances in the occupied zone
- Prevent the spread of fire by means of fire dampers
- Prevent the spread of smoke by means of a powered smoke exhaust system

An effective and efficient ventilation and air conditioning system not only provides a hygienic and safe environment; the improved indoor air quality also helps patients to recover more quickly, and staff to perform better. These are two aspects that pay off!

For hygiene reasons only a one-directional airflow is allowed in specific rooms, i.e. from sterile areas with a minimum germ count to less sterile areas where the requirements are not quite as demanding. Intelligent TROX control components and systems keep the supply and extract air flows separate and ensure that the required airflow direction is maintained in each room.

In the true sense of the word: The art of handling air.

TROX components, units and systems in a hospital:

- | | |
|---|--|
| 1 Air handling units | 10 Disc valves (extract air) |
| 2 Operating theatre ceiling with high-efficiency particulate filter | 11 Circular silencers |
| 3 Particulate filter air terminal devices | 12 Fire dampers (KU-K30) with air terminal devices |
| 4 Fire dampers with TROXNETCOM | 13 Multileaf dampers |
| 5 Volume flow controller with EASYLAB | 14 Smoke extract dampers |
| 6 Swirl diffusers | 15 Smoke exhaust fans |
| 7 Volume flow controllers | 16 X-FANS smoke exhaust fans for roof installation |
| 8 Jet nozzles | 17 X-FANS jet ventilation fans |
| 9 Ventilation grilles | |



Laminar flow causing very little turbulence
Protection zone
 Discharge velocity: 0.23 to 0.25 m/s
 Supply air differential: 0.5 to 3 K
 Protection zone: usually 3.2 x 3.2 m
 Volume flow rate: 9200 m³/h
 Fresh air flow rate: at least 1200 m³/h
 3-stage filtration: at least M5, F9, H13

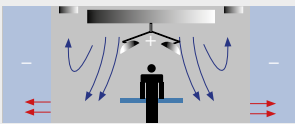
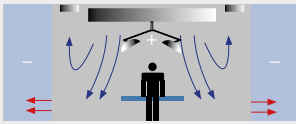
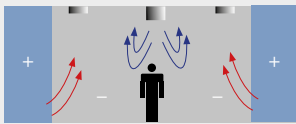
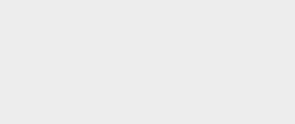
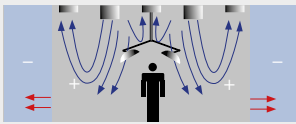
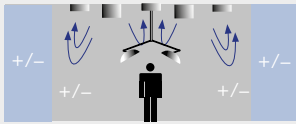
Safe hygiene practice in aseptic areas.

The most critical requirements apply to the air in operating theatres. To prevent infections caused by airborne pathogens, and to ensure that standards of occupational medicine are adhered to, airflow and air filtration play a particularly important role.

Room categories
 according to DIN 1946-4 and alternative ventilation systems

Operating theatre.

In operating theatres as well as in pre op and post op units ventilation and air conditioning systems are indispensable. Near turbulence-free laminar flow provides a dynamic shield for the special protection zone with the operating table and the instrument trolley. Filtered and conditioned, extremely clean air reduces the number of micro-organisms and consequently lowers the risk of wound contamination. Operating theatres can only be accessed via airlocks; they are characterised by positive pressure such that no pathogens from neighbouring rooms can enter.

| Room class Ia | Room class Ib | Room class II |
|---|---|---|
| Very high requirements on hygiene: operating theatres for transplant, thoracic and trauma surgery | Increased hygiene requirements: recovery rooms, ICU | General hygiene requirements: other treatment rooms, ENT |
|  |  |  |
|  |  |  |
| Dynamically shielded protection zone | Static pressure | Air transfer / mixed flow |

Areas adjoined to the operating theatre.

The DIN 1946-4-12-2008 standard contains exemplified definitions of the classes of rooms adjoined to operating theatres. The latest version of this standard follows scientific research findings in that airborne micro-organisms pose actually a rather small risk of infection. As a consequence, the conditions for special protection are maintained only in areas where this is essential. Rooms adjoined to operating theatres need not be protected to the same degree as operating theatres themselves; this reduces both the complexity of the ventilation and air conditioning system and the energy consumed.

The air conditioning for areas such as intensive care units, sterile care rooms and isolating rooms must fulfil special requirements. Here, the 'outside world' is kept outside by means of different pressure levels (positive or negative pressure), airlocks and effective filtration of the supply and extract air.

Filters play a major role in sterile rooms as they have to achieve very high efficiency levels at minimum differential pressures.

In-patient wards.

A sufficient supply of hygienically safe air is the prerequisite for a rapid recovery. It is not surprising, then, that a perfectly functioning ventilation and air conditioning system is nowadays appreciated by hospitals as a welcome marketing instrument since it ensures patient satisfaction. Innovative air terminal devices with adjustable air distribution elements respond fast and reduce the air velocity; lower velocity means reduced turbulence and hence increased comfort for patients.

In many countries, e.g. Spain or the UK, air-water systems such as active chilled beams are also allowed. Needless to say that they must meet high hygiene requirements, provide efficient filtration and allow for easy cleaning.



TROX KSFS
 ducted particulate filter
 for critical requirements

Visitors' area.

Hospitals rely on recommendations and they have known for a long time that it is not only the patients' opinions that count; the impression given to visitors is probably no less important. In modern hospital buildings, effective and efficient ventilation and air conditioning also in the visitors' area is state of the art.

Staff area.

Common rooms, meeting rooms or offices are not required to have a mechanical ventilation system yet scientists have long known the inspiring effect of good indoor air. Studies have in fact shown that performance levels may increase by up to 6 %. In other words: Investing into the refurbishment of existing ventilation and air conditioning systems pays off because the economic effect of a favourable indoor air climate is an undisputed fact. Renowned scientists* have calculated an economic benefit of up to US\$ 700 per year and employee; this sum can be saved due to better staff performance and fewer sick days.

*Source: William Fisk, Olli Seppänen: Providing Better Indoor Environmental Quality Brings Economic Benefits



Innovative ventilation concepts.

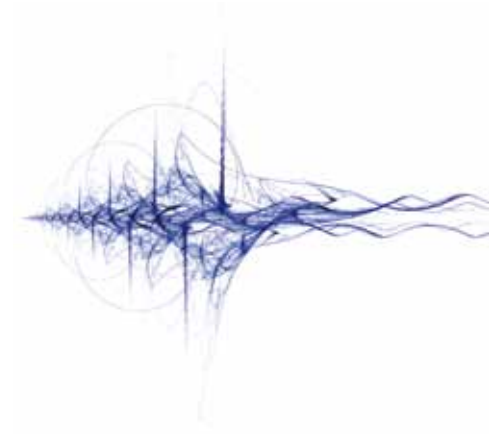
Hospitals need
comprehensive
solutions.

For ventilation systems in hospitals the optimum is the goal. Comprehensive concepts with an integrated approach are required to meet the most critical demands of hygiene and reliability.

Athens, Greece
Children's Oncology Unit
'Marianna V. Vardinoyiannis-Elpida'



Air pollution control.



Melbourne, Australia
The Royal Women's Hospital

Modern air terminal devices
with innovative blade contours ensure that air is supplied quietly and virtually draught-free



Air is life. It provides us with vital oxygen. But what if the immune system has been compromised? In such a case even breathing can be life-threatening since pollutants, bacteria, or even a virus may be introduced with each breath taken. A healthy body can withstand such hazards; a body weakened by disease, cannot. This is why the conditioning and control of airflows is actually elementary in hospitals.

Effective filtering must minimise the risk of infection. Patients must not be exposed to pathogens, pollutants or contaminants in the room air.

Yet filtration alone is not the only solution. Air can easily overcome barriers and can, hence, not be locked out. By using precise pressure control and airlocks, however, it is possible to isolate rooms with particularly critical requirements on air purity.

Fit for a hospital. Air management by TROX.

On the following pages we present some interesting reference projects and discuss in particular the technical requirements on volume flow control, air filters and air handling units in the different areas of a hospital.

Innovative, well proven technology from TROX can be found in many big and reputable hospitals all over the world. This doesn't come as a surprise since TROX products meet the most demanding requirements of hygiene and safety in each and every respect.

Rennes, France
Centre Hospitalier Universitaire

Volume flow controllers
for pressure control



VAV terminal unit TZ/TA-Silenzio:
Meets high acoustic requirements.



project report

TROX high efficiency filters.

In addition to the filtration of fresh air, which is also common to other buildings, hospitals use particulate filters for aseptic areas because they ensure a particularly high air purity and can filter out even the tiniest particles and germs. Such filters are ceiling mounted and have a diffuser face. Particulate filters are classified to EN 1822 as EPA (classes E10 to E12), HEPA (H13 and H14), or ULPA (U15 to U17).

What does the filter class mean?

U16 means that only one particle permeates the filter.



If a U16 filter with an efficiency of 99.99995% is exposed to 2 million particles, only one particle will not be filtered out. By comparison, an H13 filter (99.95% efficiency) will be permeated by 1000 particles, and an M6 filter (50% efficiency) by one million particles.

Particulate filters are subject to efficiency tests before shipping.

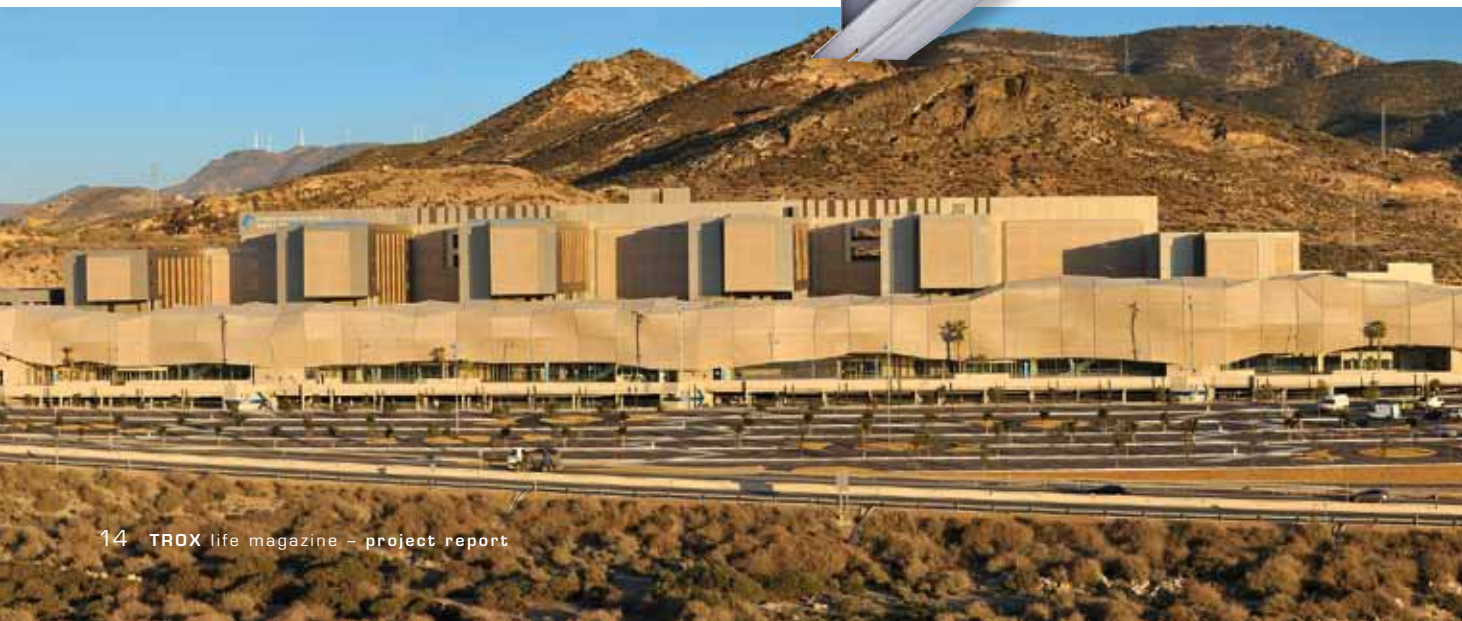


AIRNAMIC ceiling diffuser with HEPA filter



*Cartagena, Spain
Cartagena Hospital*

Slot diffusers can be aesthetically integrated into the ceilings of hospital corridors



*Hamburg, Germany
Hamburg-Eppendorf university hospital*

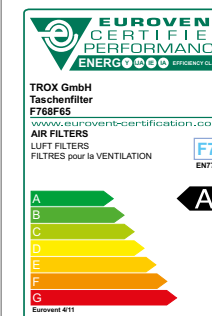
Quality control: TROX is the pacemaker.

For several decades TROX has been setting the standard for the entire industry. Quality control and product development are tested on a test rig to EN 779. TROX was also one of the driving forces behind the EUROVENT certification. The EUROVENT energy label has been used since last year and makes it much easier to select energy-efficient filters.

Air filtration greatly affects the energy consumption of air conditioning systems. Each filter poses an obstacle to the airflow. As the dust load increases, the differential pressure of the filter also increases. The only way to maintain a constant operating volume flow rate despite the increasing differential pressure is to increase the fan power, but this results in an increased energy consumption. The differential pressure increase is therefore measured and evaluated with regard to the energy efficiency of the filter.



Minipleat filter insert for large volume flow rates; Eurovent-certified





Santa Bárbara, Brazil
Hospital Unimed de Belo Horizonte



TROX active chilled beams:
Effective cooling yet pleasantly low air flow velocities in the occupied zone

TROX EASYLAB.

TROX has developed a system solution that makes it possible to precisely control and monitor the pressure in hospital areas or rooms where this is critical, e.g. isolation wards. The system includes actuators with very short response times of less than 3 seconds that enable the precise and fast control of the desired air change rate and the resulting room pressures. EASYLAB enables the monitoring of important room parameters and the generating of alarms; it therefore eliminates the need for other systems.

Communication with higher-level BMS is achieved with standard bus protocols such as

LON, BACnet or Modbus. In case of an interruption of the communication with the BMS, or if there is no other higher-level system, the independent EASYLAB system will still continue to function smoothly. Safety of people is ensured at all times.

EASYLAB and TCU-LON-II use only static differential pressure transducers for volume flow rate measurement as these have a number of decisive advantages:

- Resistant to dust and pollution; additionally optimised by indoor air induction
- Rapid response measurement
- Long-term stable volume flow rate measurement due to automatic zero point correction



TROX EASYLAB
communication system
Smooth integration with the BMS



Moscow, Russia
Federal research and clinical centre of pediatrics, oncology and immunology for children



TROXNETCOM.

In hospital areas with many people whose mobility is reduced or who are immobile, the functional reliability of fire and smoke protection systems is essential. This functional reliability is achieved with concepts that focus on the protection goal and that are appropriate to the risk. According to IEC 61508, the requirements for these systems are based on a risk analysis. Components are given an SIL rating (safety integrity level) and must meet the corresponding requirements to ensure safety even in case of a malfunction. TROXNETCOM offers solutions that are SIL2-certified and provide comprehensive safety.

The advantages at a glance:

- Automated and documented functional tests allow for demand-based maintenance
- Very simple wiring and easy expansion
- Up to 1780 dampers can be installed across 18 km



TROX fire dampers with AS-i module
Europe: Including a declaration of performance according to the new Construction Products Regulation of 1 July 2013



Greensboro, North Carolina, USA
Moses H. Cone Memorial Hospital





TROX X-CUBE: Setting the pace for hygiene.

Even the basic version of the X-CUBE air handling unit sets new standards for hygiene and quality. For example, the unique stainless steel condensate drip tray is sloped on all sides and ensures complete drainage. Premium powder coating guarantees optimum corrosion protection.

For hospitals in particular, the X-CUBE has been provided with special features that meet the high requirements of the DIN 1946-4 standard. Stainless steel base, smooth interior surfaces, and high-efficiency filters conforming to standards ensure air hygiene and air purity in the highly sensitive areas of hospitals.

Clean room technology. Sophisticated and flexible.

The X-CUBE CROFCU is a compact ventilation unit that ensures and maintains the essential conditions for all classes of clean rooms, e.g. laboratories. The secondary unit for use with centralised ventilation and air conditioning systems is typically installed in false ceilings.



Düsseldorf, Germany
Municipal Hospital

It dissipates high thermal loads and requires only a low fresh air volume flow. The fresh air system (patent pending) allows for the direct removal of exhaust air while fresh air is supplied to the room.



Air conditioning for clean rooms:
TROX X-CUBE CROFCU
(Clean Room Fan Coil Unit)

CROFCU advantages at a glance:

- Suitable for all classes of clean rooms (ISO 14644-1) when combined with particulate filters
- Pumped chilled water cooling systems with integral piping
- Increased flexibility if several units are connected
- Energy-efficient plug fan with EC motor
- Monitoring of filters downstream
- Control of airlocks for people and material
- Contamination check by means of pressure zone control
- Space-saving due to smaller ducts
- Energy efficiency class A

Important standards and guidelines relating to ventilation and air conditioning

- EN 779** Particulate air filters for general ventilation – filtration efficiency
- EN 1822 (all parts)** Particulate filters (HEPA and ULPA)
- EN 13779** Ventilation for non-residential buildings. Performance requirements for ventilation and room-conditioning systems
- DIN 1946-4** Ventilation and air conditioning in healthcare
- SWKI Guideline 99-3** Heating and air conditioning systems in hospital buildings
- ISO 14644-3** Clean rooms and related clean room areas – part 3: Test methods
- VDI 6022 Part 1** Hygiene requirements on air handling units and systems
- ANSI/ASHRAE Standard 170-2010** Ventilation of healthcare facilities

From Medicus to Medicine.

Aesculap
(Asklepios in Greek),
the god of healing in
Greek mythology



The history of medicine.

The origins of medicine are closely linked with religion. Evidence of this can be seen in ancient **Egypt**, where people came to temples to be treated when sick. The first independent facilities for treating sick people were set up in Sri Lanka and later India.

Traditional **Chinese medicine** originated some time in the second millennium before Christ from simple demon and ancestral healing cults. In the post-Confucian period, it evolved to become today's natural philosophical system of dual (Yin and Yang) and elementary (the five elements of nature) counterparts.

The Middle Ages.

In the Early Middle Ages, it was the Arabic world whose intellectuals and doctors developed medicines and performed operations on a relatively high level. In Noah Gordon's novel, this is why "Medicus" came to Isfahan in Persia.



During the Middle Ages in Europe, hospitals also served as poor houses or as hostels for pilgrims. The term **Hospital** itself comes from the Latin word hospes, meaning "guest" or "stranger". The first modern hospitals appeared in the 18th century. The Charité in Berlin, for example, was founded in 1710 as a plague hospital.

Since the foundation of general hospitals, such as that in **Vienna** around 1780, hospitals gradually moved away from being establishments that provided aid to the poor to institutions for intensive medical diagnostics and therapy. They also became centres for education, learning and the liberal arts: grammar, rhetoric, dialectics, geometry, arithmetic, music and astronomy.



Hildegard: saint and healer.

Saint Hildegard of Bingen *born in the summer of 1098 in Bermersheim vor der Höhe or in Niederhosenbach, † died on 17th September 1179 in the Rupertsberg monastery at Bingen am Rhein. She was a Benedictine, writer and important polymath of her time.

Hildegard of Bingen is regarded as the mother of naturopathy. She is the famous author of **Causae et Curae** (Causes and Cures), a book she compiled in 1150 on the causes and treatment of various illnesses. Her second work on natural history is called **Liber subtilitatum diversarum naturarum creaturarum**, which basically translates as the "Book about the inner being (nature and healing power) of various creatures and plants". This is the work that resulted in Hildegard often being described as the first German doctor.

In the Middle Ages, doctors were monastic medical practitioners and reputed miracle healers, as the scientific study of medicine was as yet unheard of. An extraordinary achievement by Hildegard was her success in combining existing knowledge on illnesses and plants from the Greek-Latin tradition with folk medicine – as was her use of common plant names for the first time and the fact that she documented her extremely valuable knowledge.

Hildegard of Bingen was canonised in 2012 by Pope Benedict XVI.



Hildegard's
Liber Divinorum Operum

Bathing cures.

The use of hot steam as well as mineral and thermal springs for therapeutic purposes (balneology, thalassotherapy) was common practice for the Romans. A number of well-known **therapeutic baths** can be traced back to the Romans: Aquae Sulis (today: Bath), Aquae Arnementiae (today: Buxton, Derbyshire), Aquae Granni (today: Aachen), Aquae Mattiacorum (today: Wiesbaden), Aquae (today: Baden-Baden), Aquae Helveticae (today: Baden, Switzerland), Aquae Cutiliae (today: Terme di Cotilia).



Bath in Bath (UK)

In the service of medicine.

Albert Schweitzer
 *Born on 14.01.1875 in Kaysersberg near Colmar, †died on 04.09.1965 in Lambaréné, Gabon. He was a theologian, philosopher, organist, physician, and Nobel Peace Prize Laureate



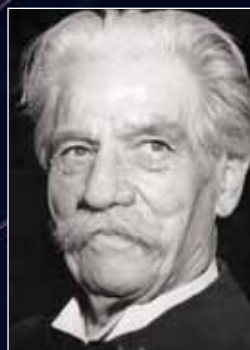
Source: Deutsches Albert-Schweitzer-Zentrum Frankfurt a. M. (archive and museum)

In 1913, the hospital in Lambaréné was built by Albert Schweitzer.



Albert Schweitzer, the "Jungle Doctor".

Known as the Jungle Doctor from Lambaréné, Albert Schweitzer is without doubt one of the world's most fascinating and admired people. Medicine was just one of the numerous professions of this polymath. When Schweitzer began his medicine studies (1905 – 1913), with the aim of working as a missionary doctor in Gabon, he was already a Professor of Theology and Philosophy at the University of Strasbourg. Enrolment in medicine was therefore extremely complicated for the university lecturer, who ultimately had to obtain special approval from government to do so.



Interestingly, his final thesis was a type of symbiosis of his various academic disciplines: "A psychiatric assessment of Jesus." Schweitzer also graduated as a physician, making him a professor in three different subjects areas.

In 1913, Schweitzer made his dream a reality and founded the Lambaréné jungle hospital in French Equatorial Africa – known as Gabon today – on the Ogooué, a 1,200 km long river on the west coast of Africa.

During the First World War, he was arrested as a "German Alsation" and brought from Africa to France. At the end of the war, he returned to Alsace, which had in the meantime been annexed to France again, and was given French citizenship. He then went on to work as an assistant doctor in an infirmary in Strasbourg. Thanks to a Swedish bishop, Schweitzer was given the opportunity to give organ recitals in Sweden from 1920 onwards – he was also an organist, musicologist and theorist of organbuilding – which allowed him to earn money to pay his debts and further expand the Lambaréné Hospital.

The hospital itself was fully self-sufficient. Along with large fruit and vegetable gardens and 250 sheep and goats, it had its own workshops, kitchen and bakery. The hospital, which was located on the river, consisted of a village made up of 70 simple timber houses. It could accommodate up to 470 in-patients, and between 100 and 200 sick people were provided with medical attention on an out-patient basis every day. Meanwhile, the nearby Village de Lumière could provide care for up to 70 leprosy patients. Patients came from villages within a surrounding radius of 600 kilometres. Schweitzer believed that all life should be respected and this was also the ethic of the hospital – which meant that it also served as a veterinary hospital. Dogs, sheep, goats, pelicans, antelopes and apes were all treated within its walls.

Hôtel-Dieu (French: "Hostel of God") is a former hospital in Beaune. It was built in 1443 and used as a hospital up until 1971.



The world's largest hospitals.

+ *The Chris Hani Baragwanath Hospital in Soweto is, with 3,200 beds, reputedly the largest hospital in the world and employs 6,760 people.*

+ *The Charité, after several mergers with Berlin hospitals, is the largest clinical centre in Europe, accommodating 130,000 patients a year and employing a staff of 14,500. Almost a million out-patients come to the Charité each year for treatment.*

+ *The Allgemeine Krankenhaus der Stadt Wien (AKH –Vienna General Hospital) is also a medical university campus. At one point, the AKH was the second largest hospital in the world. It has over 2,000 beds. In 2010, more than 100,000 in-patients were treated here. Being Europe's largest hospital, the AKH employs 9,300 people, of which 1,500 are doctors.*

+ *The Africa Mercy, the world's largest hospital ship and owned by the international aid organisation Mercy Ships, provides free medical care to people. 400 volunteers (doctors, dentists, nurses, aid workers, teachers, construction workers, cooks, seamen, engineers, etc.) are currently on duty in Liberia.*

Number of Nobel Peace Prize Laureates for medicine per nation between 1901 and 2012



+ The Africa Mercy.

Length: 152 m
Width: 24 m
Weight: 16,572 t
 474 beds for the crew
 78 beds for the hospital ward
 6 operating theatres, X-ray room,
 CAT scanner, dental clinic, pharmacy,
 and a school for up to 60 children



Cap Anamur. Medical aid in crisis regions.

An interview with paediatricians Dr. Nellie Bell and Dr. Werner Strahl.



Dr. Werner Strahl, Chairperson of Cap Anamur

1979 – over 10,000 "boat people" were rescued and a further 35,000 people received medical care on-board.

The humanitarian organisation Cap Anamur, which was founded in 1979 by Christel and Rupert Neudeck with support from German author Heinrich Böll, shot to fame around the world when the ship with the same name rescued thousands of Vietnamese refugees, or "boat people" as they came to be known.

Cap Anamur is currently present in 52 countries, where war, natural disaster or poverty threaten the survival of the population. The current situation in crisis-ridden Syria serves as a good example of such a country in need. Experienced doctors, nurses and technicians work to relieve the existential emergency by providing emergency medical aid in ambulances and hospitals, by building care centres and by supplying urgently needed medication, dressings and equipment. Permanent aid is ensured by training local staff.



Dr. med. Nellie Bell from Sierra Leone



TROX life spoke with "retired" paediatrician Dr. Werner Strahl and his colleague Dr. med. Nellie Bell from Sierra Leone. As Chairperson of Cap Anamur, Dr. Strahl works with a small, experienced management team on the coordination of operations in 10 countries at present.

If you could wish for something, what would it be?

Fewer disasters and wars. That instead of producing weapons, we build schools and medical centres that provide care for pregnant women and midwifery services, and that the right to food and clean water be implemented. I would wish for an end to the plight of refugees around the world and to warmongering ideologies.

Do you see any way that these wishes could come true?

One way would be to massively restrict the export of weapons and to enforce international disarmament. Germany is now the world's third largest weapons exporter, which I think is an absolute disgrace. We urgently need a fair world trade order, one that allows poor nations to advance development in their own country. The excessive export of tropical products (e.g. palm oil, soya, cocoa) drastically decreases

the availability of food for the local population and has a major impact on its price. The natural conclusion of this is hunger. So instead of weapons and exploitation, what we need are diverse initiatives to promote self-sufficiency and development in partnership.

As paediatricians, the provision of care for mothers and children is something that is particularly close to your heart?

In all the countries where we work, we are trying to reduce the appallingly high maternal and infant mortality rate by providing care in pregnancy as well as midwifery services. Particularly in this area, we rely on the understanding and cooperation of the local women, and the men. In Afghanistan, we are proud of our training programmes for village midwives and nurses. Something

that is quite uncommon for Muslim countries, husbands here allow their women, who are eager to learn, to travel to the regional capital of Herat, where they receive training in a large clinic for a period of two years. Equipped with the necessary medical equipment, they can then provide aid in their home villages, e.g. manage home births or arrange for women who have pregnancy complications to be transferred to clinics on time. The men can be proud of their knowledgeable women, who consequently earn their own money. In terms of the content and implementation of this programme, our model is now being adopted for the rest of Afghanistan.

What makes Cap Anamur special?

As we do not receive any public funding, we are completely independent of political influence when it comes to making decisions on where and for how long we provide aid. However, we are indebted and eternally grateful to our many benefactors. Our work would not be possible without the experience, dedication, courage and empathy of our small teams abroad, who work and live beside these people in need instead of taking up offices in main cities.



Students of the Cap Anamur midwife training programme practicing on dummies



Since August 2011, a team of doctors and logistics experts has been working in the completely overcrowded Benadir Hospital.

We also work in dangerous areas, once the danger conditions and the emergency have been assessed. For two years, we were the only Western aid organisation with its own staff in war-torn Mogadishu/Somalia. There, we rebuilt the large Benadir Hospital (240 beds) and ran it under very difficult and dangerous conditions for two years. Our small team (2 doctors, 2 nurses and 2 "technicians", responsible for construction, procurement, organisation and security, etc.) hired local people and trained them in the face of extreme adversity and countless seriously ill children. In April 2013, acute threats from fanatics and criminal terrorists forced us to withdraw from the area. However, we are very optimistic that the hospital can continue to operate on its own.

What has been your longest project so far?

We have been working in South Sudan for the past 15 years on a project that is actually illegal in the Nuba mountains region. During the bloody civil war, which went on for a decade, our small bush hospital with its surrounding care centres provided the only hope and possibility of care for the desperate population. The peace treaty in 2005 led to the South acquiring independence in 2011 and stipulated that a separate referendum be held for the Nuba mountains region, an area rich in natural resources. The presumably falsified result is not being accepted by the Nuba, which means that they continue to be terrorised and demoralised by air raids. Families are seeking protection in stone caves and cannot tend to their fields due to the threat. All our teams have, in spite of the danger, decided to remain on the ground and provide aid where they can, even though land supplies from Kenya cannot reach them during the rainy season between April and October, and there is no possibility of escaping to Kenya. Meanwhile, a native nurse has learned so much from the many international surgeons stationed there that if need be I would have no hesitation in going under the knife at his competent hands.

An aircraft brings medications and relief supplies to the hospital in Lwera, Sudan.



Aid organisations are often accused of "disaster hopping" from one place to the next, leaving others to pick up the pieces after they have left. How do you feel about this?

When you take our many years of work in Sudan, you can see that this is not what we do. We stay until the emergency situation has abated or until we are certain that we are leaving the project in local, capable hands. We either begin new assignments very quickly when a disaster occurs, deploying experienced "old hands" from Cap Anamur with our emergency equipment (e.g. the tsunami or the Haiti earthquake) or only after we have thoroughly looked into the situation in chronic disaster zones (e.g. Madagascar) so that we can begin accordingly. As nobody can get rich on the little salary they earn at Cap Anamur (everyone earns the same amount) and we cannot get involved in the "jovial aid worker's life" in the main cities, I think you have a clear answer to your question.



With so many Cap Anamur projects, it must be difficult to maintain an overview?

With roughly 20 to 30 employees abroad working on 10 projects, we have an astoundingly lean but effective administrative structure with only 2 full-time and 2 part-time employees. We also have a circle of dedicated volunteers, who all support Cap Anamur both in Germany and abroad on a voluntary basis. In such a small, close-knit organisational structure, you get to know one another very well.

How happy are you with your monetary support?

With minimal advertising expenses (2 letters per year to benefactors, lectures by people returning home and Internet information), we are delighted with the tremendous generosity of people and their willingness to donate, often in the form of standing orders. Having been awarded the German charitable donations seal (Spendensiegel) and the Transparency Prize, we are confident that we can continue to take on long-term assignments and we are very grateful to our benefactors for this.

Is there anything you are particularly happy about at the moment?

In Freetown, the capital of Sierra Leone, we have spent the past three years refurbishing the only children's hospital in the country, the Ola During Children's Hospital, with its 5 departments. Here, with the end of the awful civil war, the emergency aid is going into the development of a hospital. The objective is to improve operations in the hospital so that it may serve as a model hospital and training centre. Nellie is heading our small team there. She originally comes from Sierra Leone, but studied to become a paediatrician in Germany. She intends to remain there in the future.

The new Pickin Paddy House for homeless children is located 10 minutes away from the hospital. Up to 60 of the estimated 10,000 children living on the streets can be accommodated there. We try to return them to their families around the country as quickly as possible or help them to find host families and schools. The work and dedication of our highly motivated social workers here is tremendous, but the smile on a child's face is always worth it.

Dr. Bell, Dr. Strahl, thank you for speaking with us.



Would you too like to donate? Here are the bank details for Cap Anamur:

Sparkasse KölnBonn
Account number: 2 222 222
Sort code: 370 50 198



Cap Anamur on the rescue of the boat people on YouTube: www.youtube.com/user/boatpeoplestory?feature=watch

The placebo effect.

Believing is healing.

The placebo effect is one of the genuinely wondrous phenomena in medicine because it is down to a trick of the brain.





Placebo research.

An experiment reportedly consisted in administering chalk to competitive athletes, but telling them that the dissolved substance was a low and therefore harmless dose of Indian arrow poison, which would help them perform better. The result was that the athletes boosted their performance by up to 15%. This is just one of many intriguing phenomena discovered in the study of the placebo effect.



I shall be acceptable.

This is the literal translation of the Latin term placebo. In a stricter sense of the word, placebo designates a "sham" medical substance or procedure that has no real therapeutic properties, but may still produce a beneficial effect, as shown in the example with the athletes. According to placebo expert Paul Enck, the effect is attributed to the patient's belief that the drug or treatment will work.

Even the ancient Greeks knew that faith can move mountains when it comes to sick people. Indeed, the first reference to the placebo effect is found in Plato's works (427–347 BC). In contrast to Hippocrates (460–370 BC), he thought that words really have the power to heal. Apparently, the argument between academic medicine and alternative medicine was already well underway!

However, the placebo effect is confirmed time and again by the most incredible stories. For instance: during the Second World War, the doctors ran out of morphine. They therefore injected soldiers with a saline solution, which diluted the blood but had no therapeutic effect. Still, believing that they were given an effective analgesic drug, patients felt better.

Placebos are most effective against symptoms like headaches and least effective in biochemical processes. This means that they can alleviate the symptoms of an illness effectively, but not treat the underlying cause.

*Faster, higher, further:
Placebos have also proven effective
on athletes.*



*The Placebo effect is down
to a trick of the brain.*



The healing spirit.

That believing in the healing power of a drug or a doctor can alleviate the symptoms of a disease has now also been demonstrated in studies of sham surgeries. In the US, an orthopaedic surgeon simulated operations of knee injuries on basketball players by simply making incisions and stitching them. The amazing result was that many patients felt much better after the supposed intervention. They were free of pain and could train at a normal pace again.

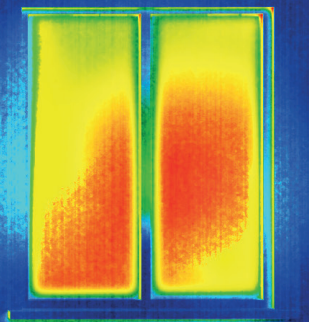
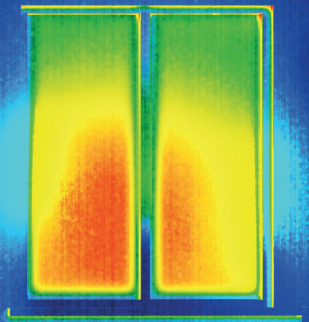
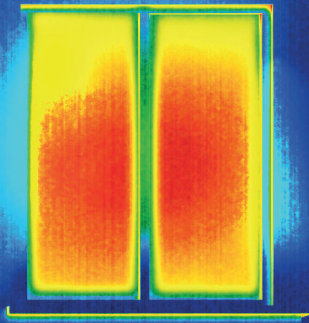
Brain stimulus.

One of the most renowned placebo researchers is Paul Enck from the Department of Psychosomatic Medicine and Psychotherapy at University Hospital Tübingen, Germany. He believes that the placebo effect is a process in which a strong belief in something triggers mechanisms in the brain which turn what we perceive and believe into actual biochemical processes. Mental processes, he says, have their own biology, which is altered by the placebo. In the hope of pain relief, for

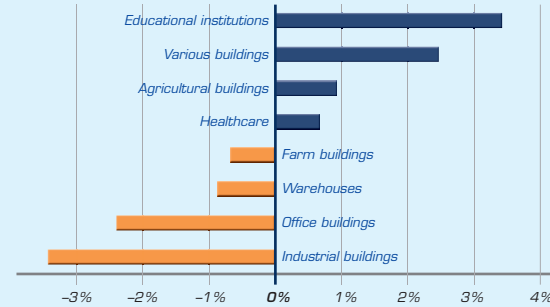
instance, our bodies will produce analgesic hormones which affect the neurons.

Professor Winfried Rief from the Institute of Psychology and Psychotherapy at the University of Marburg, Germany, has found that patients that have positive expectations about the outcome of a cardiac intervention will see positive results. That is, if patients believe that after a certain time the surgery undergone will no longer affect them negatively and they will be able to return to work, there is a high probability that this will be the case.

How your expectations can change your physical state is demonstrated by the following amusing example of the placebo effect. Thinking that they were given "regular" beer, test subjects at the Cannstatt Volksfest (Stuttgart) who were, in fact, given non-alcoholic beer, displayed all the symptoms of the inebriated: they began to slur their words and could not touch the tip of their nose with their index finger or walk straight on a white line. Of course, the opposite effect would also be interesting. Is there a way to drink yourself sober?

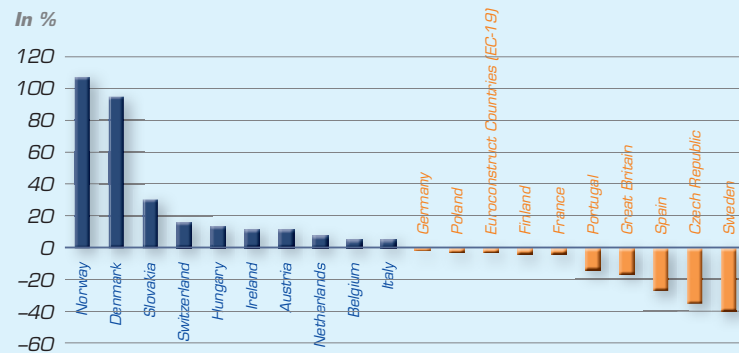


Development in non-residential construction 2009-2011



Source: Euroconstruct (74th Conference)

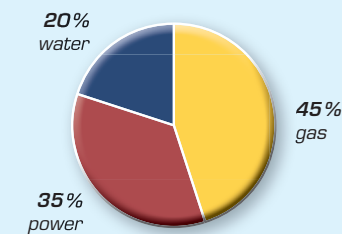
Growth rates in the health sector across countries 2013-2015



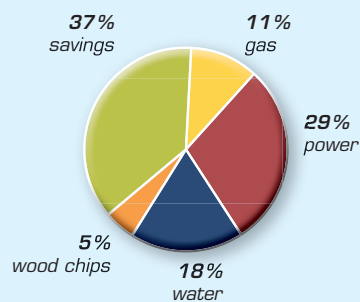
After the severe reduction in building and refurbishment activities in non-residential construction as a result of the financial crisis, a positive trend reversal is beginning to emerge. For the first time, recovery and growth are being forecasted for the coming years. However, heavily indebted countries are still bringing down the pace of growth in the healthcare sector.

A sample hospital refurbishment: energy savings potential

Power consumption before refurbishment



Power consumption and savings after refurbishment



Source: axima.de

Healthy momentum.

Boom in hospital construction.

There has been an enormous increase in the cost pressure on hospitals. As hospitals are considered to be among the most energy-intensive buildings, massive savings in operating costs could be made using energy-efficient building services engineering and reducing the consumption of primary energy.

In most cases, however, not enough funds are available to invest in the energy-efficient refurbishment of buildings, the vast majority of which were built in the seventies or eighties. Investments in medical technology generally take precedence. The result of this is that older hospitals no longer meet any of the current standards of the Energy Saving Ordinance (EnEV). As a way out of this dilemma, many hospitals are beginning to implement the long overdue refurbishment by means of an Energy Performance Contracting project. Doing so can generally generate energy savings of up to 40 % and result in substantial maintenance cost benefits. An energy-efficient refurbishment will pay for itself within 5 to 10 years depending on the condition of the building. Once the term of the contract comes to a close, the operator can then enjoy all the benefits of the cost savings.

After educational facilities, healthcare is one of the sectors offering the greatest potential. If you include care facilities, the need for new construction and refurbishment of healthcare facilities in Germany alone amounts to roughly 30 billion Euros for the next 6 years. The latest Euroconstruct report is also forecasting a positive outlook for the healthcare industry and is expecting an end to the downswing despite the ongoing financial crisis in Southern European countries.

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Turkey.

A market with healthy perspectives.

With 74 million inhabitants, Turkey has the second largest population in Europe. The average age of the population is 28.5, making Turkey a very young country with promising prospects for the future. Stable growth rates and a growing interest in foreign investors have made Turkey and its neighbouring states an interesting market place.

Increasing prosperity means that healthcare in this region is becoming a promising sector for investors like companies in the construction industry. 35 hospital projects alone, worth a total value of 43 billion Euros, are currently on the agenda for the Turkish Ministry of Health, with capacity for up to 50,000 new beds to be created in the near future.

Within the framework of a public-private partnership model, Turkey is working in close cooperation with private investors here. It is planned that they build medical facilities on public land in accordance with stipulations of the Ministry of Health and then let them to ministerial institutions. The investment will certainly pay off, in that the Turkish state intends to pay roughly 34,000 Euros per hospital bed in rent per year.

Hospitals with more than 200 beds will have to provide proof of LEED certification* in the future, which is an argument for the use of high-quality and energy-efficient ventilation systems.

Infrastructure plans also go hand in hand with the provision of better medical care. In Istanbul, the world's largest airport will be built for 150 million passengers/year. A consortium of five companies just won the bid for this complex project worth 22 billion Euros. The airport will consist of six landing strips, 16 runways, 165 jetways and an airfield measuring 6.5 million squared metres with parking space for up to 500 aircraft. The project will create 100,000 new jobs.



* LEED – Leadership in Energy and Environmental Design.



Four questions for Prof. Koç and Dr. Bilge on the development of the healthcare industry.

Prof. Koç, which developments do you see in building services engineering (BSE), particularly in the area of room air conditioning?

In the past, price was the most important factor. Today, however, environmentally oriented actions are the order of the day. The focus is increasingly being put on high-quality products with innovative and energy-efficient solutions.

How would you describe the market for building services engineering?

In Turkey, like in its bordering states, major contracts are usually carried out by general contracting companies and syndicates (consortiums). This means that the decision makers are more or less the general contracting companies and not the engineering offices.

Dr. Bilge, how would you assess the construction developments and their technical standards and what kind of potential can we expect in the healthcare industry for the next 10 years?

Immense efforts are currently being made in the healthcare industry, with most governments around the Black Sea having set the objective of ensuring high-quality medical care. Attractive incentives and lucrative financing models for private investors support this vision. Incentive systems are being tendered for more than 100 new hospitals, 27 major new construction projects are already in the pipeline and the refurbishment of almost half of the almost 1,000 hospitals will be complete in the coming years: Turkey's goal is to become a healthcare centre for the entire Black Sea region – and to do so with the highest building services engineering and medical standards. The growth in health tourism is clear proof of the coherence of this strategy.

The operating costs of hospitals are relatively high. Are we seeing a trend to reduce operating costs, and particularly energy costs?

Energy efficiency is one of the key factors of modern air conditioning, heating, ventilation and refrigeration technology applications. The following factors have a considerable influence here on energy consumption:

- The BSE planning
- The architecture
- The project management as a link between BSE planning and the users
- The testing of systems

The trend is clearly moving in the direction of more innovative and energy-efficient solutions to improve the above-mentioned factors. In this context, the use of free-standing cooling systems, demand-based control of heating and room air conditioning systems and highly efficient pumps and fans can be observed. Ultimately, independent third parties like the ISKAV should take over the testing and certification of units in accordance with global standards like those of the NEBB.



Prof. Dr. Ali Koç
is Vice Rector for Thermodynamics (HLKK) at Mustafa Kemal Hatay University, one of the most important universities in the country.



Dr. Mustafa Bilge,
Department of Thermodynamics, lecturer of Room Air Distribution, General Manager of the BSE consulting company Mecon Yapı Endüstriyel Mühendislik Taahhüt ve Tic.Ltd.Sti. in Istanbul.

NEBB – National Environmental Balancing Bureau
ISKAV – Heating, Air Conditioning, Research Foundation

Climatotherapy.

Meteorosensitivity,
stimulating climates,
therapeutic baths.

It is the subject of small talk par excellence: the weather. Although many properties attributed to the weather remain to be proven, the medicinal benefit of climatotherapy is undeniable.



The sea climate is well known for its stimulating effect.

Bioweather.

The positive effect of pure air is undeniable, but experts still doubt the use of bioweather predictions. Since few effects have been verified, these forecasts are scarcely more reliable than a horoscope. A warning about circulatory problems during periods of hot and humid weather makes as much sense as a warning of getting wet in the rain.

In 1973, a court of law nevertheless confirmed that a person with an amputated leg suffered from extraordinary pains relating to the weather, rendering the person incapable of work. The 56-year-old was therefore awarded a pension.

Around fifty per cent of people describe themselves as meteorosensitive (abnormally sensitive to the weather) and a third even think that certain weather conditions render them incapable of work. Pain in the joints, lassitude, insomnia, circulatory disorders and other health problems are often attributed to the weather.

However, only four clear causal relationships have been proven:

- allergic reactions to pollen
- damage to skin cells by UV radiation
- respiratory diseases caused by ozone
- heat and cold stress to the body caused by atmospheric variables, such as temperature, humidity and wind. In extreme cases, such stress may lead to heart attacks, the onset of rheumatism or hypothermia.

Apart from the above reactions, there is no scientific evidence that meteorosensitivity actually exists; not even in the case of headaches thought to be caused by the foehn effect (hot mountain wind). We all react differently – some feel poorly while others feel fit as a fiddle. One weather researcher said that confirming meteorosensitivity would be like trying to establish a causal link between the frequency of sunburn and the sales figures for vanilla ice cream. They both increase on sunny days.

Climate health resorts.

At first glance, attributing health benefits to certain climatic conditions therefore seems incongruous. Still, the positive effect of natural climatotherapy and thalassotherapy* is unquestionable. But – and this is the small but significant difference – in the context of climatotherapy, it is linked to the particularly stimulating or gentle climate conditions in certain geographical locations and not to weather conditions in general.



The climate of high mountains is also a stimulating climate.

A "stimulating climate" displays certain properties which are thought to encourage and stimulate the metabolism and overall activity of the patient's body and may therefore constitute a considerable factor in healing certain illnesses. We distinguish between stimulating regions, like the North Sea and high-altitude mountainous areas on the one hand, and less stimulating regions, such as low mountains (gentle climate). In a "gentle climate", there are few thermal stimuli, moderate temperature and humidity and very pure air. This climate has a soothing effect on people who show symptoms of chronic respiratory disease or skin eczema.

More recent studies have documented the long-term effect of seaside and high-altitude climatotherapy on atopy, skin disease and respiratory diseases. They point to a significant reduction in absence from work of patients with chronic illnesses such as psoriasis, atopic dermatitis or asthma, as well as a prompt and sustained relief of, e.g., the symptoms of osteoporosis.

The beneficial effect of water.

English physician Richard Russell is considered the originator of thalassotherapy*. He studied the therapeutic effect of seawater on infectious diseases and sparked the heyday of seaside health resorts, above all in France. Today, Tunisia is the second most important thalassotherapy destination after France. Thalasso institutes around the world receive around 600,000 guests per year, including celebrities like Catherine Deneuve and Karl Lagerfeld.



***thalasso**
(derived from the ancient Greek θάλασσα thálassa, meaning 'ocean') describes the treatment of illnesses with cold or warm seawater, sea air, sun, algae, mud and sand.

Dr. Château Lafite.

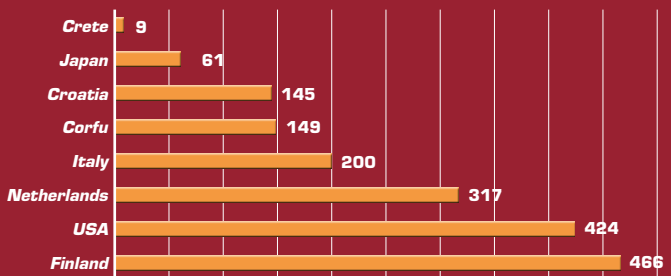
Healthy indulgence: the myth and the reality.

"For old boys, red wine is one of the best gifts possible." Wilhelm Busch was someone who knew the health benefits associated with the juice of the red grape. We read it time and again: the Mediterranean love of red wine and olive oil is credited for the fact that coronary disease is well below average in Mediterranean countries.

It seems there may be some truth in this: take the French paradox, for example. Researchers in France have discovered that although the French tend to eat food rich in calories and fat and always seem to be reaching for a cigarette, the rate of heart attacks in France is less than that of other industrial nations. Scientists have now identified the reason for this to be the daily glass of red wine enjoyed by the French. The phenolic content in the skin of the grape is what lies behind the phenomenon of red wine being healthy. It improves blood lipids and thereby reduces the risk of heart attack.

However, this has yet to be proven according to strict scientific criteria. One thing is undisputable, however, and that is that red wine certainly enriches French cuisine. Marinating red meat in red wine not only makes the meat more aromatic, but also makes it more tender. The collagen of the connective tissue in the meat is weakened, loosened and partially gelatinised by the acids and the tannins of the wine. This makes the meat more tender and releases and intensifies flavours.

Death rate* as a result of coronary disease:



Crete – the home of Mediterranean cuisine - has the lowest death rate as a result of coronary disease.

For this reason, there is a lot of talk about the Cretan diet – unfortunately something that is misinterpreted in modern communication due to the English word "diet" being literally and wrongly translated.

* per 100,000 inhabitants per 10 years



Similar health benefits are also attributed to olive oil, and this has been factually proven. Olive oil has lots of monounsaturated fatty acids, and these – in contrast to the saturated fatty acids found in foods like butter and palm fat – are healthy according to nutritionists. The oleic acids found in olive oil also reduce cholesterol. However, depending on the use, there are oils that are even better than olive oil when it comes to their healthy ingredients. Here, as is often the case, it's all in the mix (see overview).

Perhaps the real secret actually lies in the balanced diet of people that like to use olive oil. The Mediterranean cuisine, which is rich in variety and favours lots of vegetables and fish, has been shown to reduce the risk of heart disease. A team of researchers from Lyon investigated the effect of the Mediterranean diet on patients who had already had a heart attack and were therefore at a higher risk of suffering from another one. The results were astounding. Butter, cream and sunflower margarine were replaced with olive oil and rapeseed oil and the participants ate more pulses, vegetables, fresh fruit and cereal. This led to 70% more protection against heart disease in the Mediterranean group compared to the control group.

No one needs to be told that cereal, fruit and vegetables are healthy. Modern studies have found that the secret lies in the "secondary plant compounds". Secondary plant compounds are only found in small concentrations, which is what makes them different from primary plant compounds such as carbohydrates, fats and proteins. They provide antibodies for the plant against pests and disease, are associated with photosynthesis, and are responsible for the pigments and attractants.

Many investigations have revealed that secondary plant compounds help to protect against cardiovascular disease. There are indications that they are capable of stopping a healthy cell from becoming a cancerous cell. However, completely different health benefits have also been discovered: for example, some secondary plant substances reduce cholesterol levels, others fight bacteria, viruses and funguses, while others positively influence blood glucose levels or boost immune defence.

Fact: Eating and drinking can also be healthy; quantity, quality and balance are the crucial factors here.

The healthiest oils:

RAPSEED OIL has a lower percentage of saturated fatty acids, contains a lot of Omega 3 fatty acids and is a source of Vitamin A.

WALNUT OIL has slightly more Omega 3 fatty acids than rapeseed oil, but has only trace amounts of Vitamin E.

LINSEED OIL contains more Omega 3 fatty acids than any other oil.

SUNFLOWER OIL has the highest percentage of unsaturated fatty acids and very little saturated fatty acids.

OIL FROM THE GERM OF WHEAT, CORN AND RICE is a particularly high source of Vitamin E.

OLIVE OIL has less polyunsaturated fatty acids than many other oils, but does contain a lot of monounsaturated fatty acids, e.g. oleic acids. These help to reduce cholesterol levels in the blood.



Administration

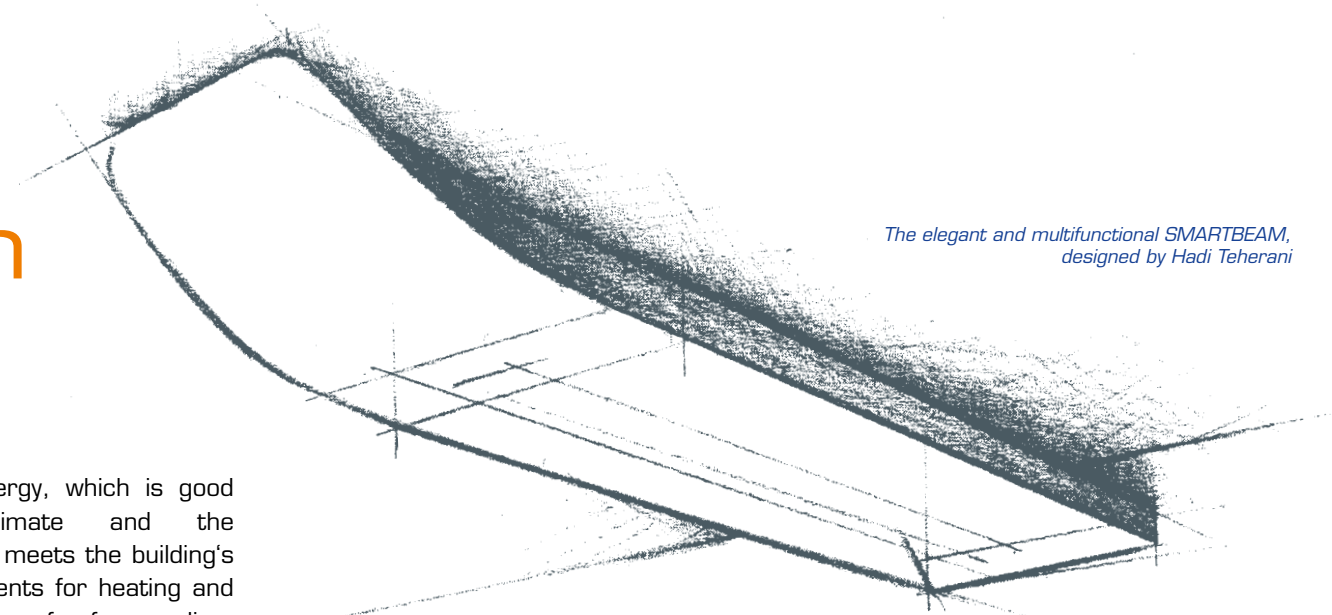
TROX International Centre
for Fire Protection

Administration

International Center for Air Conditioning
and Acoustics

Business air.

TROX on a growth trajectory.



*The elegant and multifunctional SMARTBEAM,
designed by Hadi Teherani*

The **TROX GROUP International Head Office** was expanded with a four-storey office building in late 2012. 170 new workstations were created on four levels of office space measuring a total of 3,000 square metres. The offices were designed according to the latest ergonomic and acoustic standards. They can be divided by glass partition walls according to the spatial requirements of the users and allow to flexibly respond to changing user needs in the future. The height of the desks can be adjusted electrically and users can also use them when standing.

The energy-optimised building is equipped with the latest in high-efficiency and environmentally friendly heating and air conditioning technology – of course, largely made

by TROX. The 'ventilation control centre' is located on the top floor. A TROX X-CUBE air handling unit tailored to the building conditions provides heating and cooling and supplies the office levels below with fresh air.

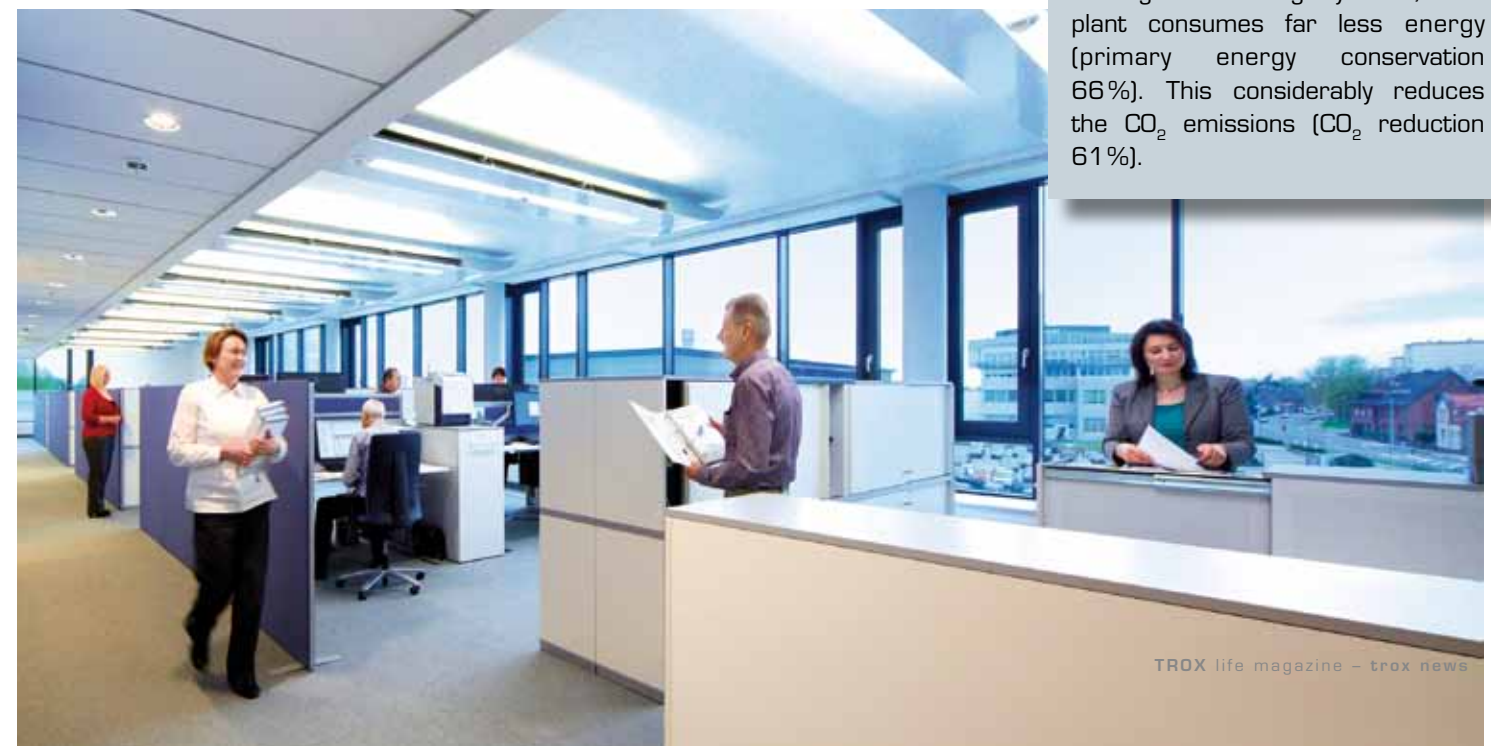
Basic heating and cooling is provided by the concrete ceilings (concrete core heating and cooling). Peak requirements are bridged by convectors when heating is needed and TROX SMARTBEAMs when cooling is needed. The SMARTBEAMs, which were designed by top designer Hadi Teherani, also ensure the supply of fresh air.

A highly efficient geothermal heat pump in connection with 31 geothermal probes, each placed 150 m deep in the ground, uses

geothermal energy, which is good for the climate and the environment. It meets the building's basic requirements for heating and cooling and allows for free cooling. Peak heating needs are covered by a gas condensation boiler, while cooling requirements are met by an air-cooled refrigerating machine.

The system's control is based on the temperature of the ground. The optimum in terms of energy is thereby achieved, which is completely in line with the TROX company philosophy.

In light-flooded rooms, the workstations were designed to the latest ergonomic standards.



Evidence of energy efficiency. Data monitoring at TROX.

In our production plant in Anholt, data monitoring is carried out on an annual basis. The first report is now available. It provides clear proof that the building services are working at optimum efficiency. Like the new administrative building in Neukirchen-Vluyn, the geothermal system there uses geothermal energy for heating and free cooling, and generates up to 97% of the total heat needed.

Compared with conventional heating and cooling systems, that plant consumes far less energy (primary energy conservation 66%). This considerably reduces the CO₂ emissions (CO₂ reduction 61%).

Everybody's Darling.

TROX technology wins award.

"It is a tremendous vote of confidence and at the same time an incentive to continue pursuing our policy of innovation and customer orientation," said Lutz Reuter, Chairman of the Board of Management at TROX, commenting on the awards won by the company. The company is the proud winner of three different awards.

Gold Winner of the Architects' Darling® Award.

Recipients of the Architects' Darling® Award know that they are among the most coveted suppliers in Germany for the most important decision-makers in the construction branch. In the area of ventilation and air-conditioning technology, this coveted prize has now been awarded to TROX. The award is based on the country's largest architecture survey in 2012, in which 2,500 architects and planners chose their favourite manufacturers in the construction industry from a pool of over 200 well-known companies.



Gold Winner of the Architects' Darling® Award



"Fire Protection Project of the Year 2013"
FeuerTRUTZ Magazine



A unique diagnosis system for X-FANS.

It seems that over 1,500 readers of the FeuerTRUTZ magazine were in agreement, choosing the TROX TLT fan diagnosis system as the "Fire Protection Product of the Year" in Nuremberg. For the reliability of a smoke extract system it is of fundamental importance that the functional reliability of the motors is ensured.

It used to be case that the motor of a fan had to be replaced at regular intervals every five years, while motor bearings and lubricants had to be replaced every two to five years. The TROX TLT diagnosis system now makes independent maintenance possible, whereby the condition of the smoke extract fans is checked every year in a 30-minute diagnostic cycle and switched on and off every six months. In this way, maintenance is only required when the diagnosis system establishes a change. This saves costs and extends the life of the motor to up to 20 years, sometimes more.

X-CUBE is Design Plus!

With the X-CUBE air handling units, TROX has set new standards. The well-designed air handling unit convinced the jurors of the Design Plus competition at this year's ISH.

High energy efficiency, unprecedented hygiene, simple assembly and maintenance, and, last but not least, intuitive operation

and a clear, basic design were all factors that tipped the scales.

An innovative panel construction hides the frame, while anthracite profiles make for aesthetic contours of the whole unit. All in all, a technically and visually perfected 'power station' designed for all kinds of buildings.

Design Plus Winner 2013
at the ISH



“A day without laughing is a day that has been lost.”

(Charlie Chaplin)

Laughter is the Best Medicine.



Laughing is good for you! According to the experts, laughing improves the function of your lungs, supplies the brain with oxygen, warms up your muscles and massages internal organs. It boosts our immune defence, stimulates digestion, reduces stress hormones and triggers the release of endorphins. In fact, laughter activates a cascade of biochemical processes throughout the body, which affect both the physical and mental state of a person in a very positive way.



Still, laughter used to be frowned upon in society, particularly when women were doing the laughing. You were supposed to cover your mouth when laughing. Even today, some people do not feel comfortable laughing in the company of others. Probably not a healthy attitude!

Humorous people are usually considered particularly sexy and attractive. For instance, single women posting lonely heart ads are almost always looking for a loving man with humour! (An age-old behaviour, according to laughing coach Heiner Uber: the peace-loving, strong and good-humoured man will provide for the family. Also, laughing stimulates the whole body, including the lower abdomen and probably contributes to more intensive ...). By the way, children laugh around 400 times a day, adults a mere 15 times. At what point do we lose our laughter?

Norman Cousins, a British journalist suffering from a bone tissue disease considered incurable, conquered the disease with humour. He discharged himself from hospital and resolved to laugh as much as possible. He then watched slapstick films and had people read him funny books and tell him jokes. After periods of intensive laughter, his joint pain disappeared, the inflammation receded and Collins laughed himself to recovery.

Of course, the Brits are supposed to have a healthy portion of humour, but the sense of euphoria that you get from laughing actually does have a medicinal benefit. Laughter has even become a serious research subject – gelotology, the study of laughter. There are now quantifiable findings about the effect of laughter.

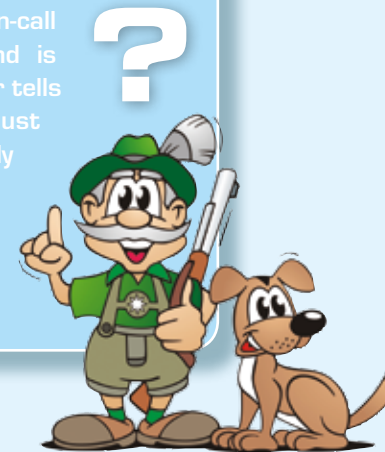
LaughLab, one of the greatest social science experiments in the field – and no, it is not a joke – investigated laughter. Richard Wiseman from the University of Hertfordshire wanted to find the “world’s funniest joke” which

would produce the most laughter from the North Pole to the South Pole and from New York to New Zealand. Online, people around the world were asked to share their favourite joke and to rate other people’s jokes. In total, 500,000 people from 70 countries participated and submitted 40,000 jokes over the Internet.

It makes sense that people of different ethnic origin, gender and background laugh at very different things. Wiseman found that Americans do not understand the subtle humour of the British at all and that the latter derive little amusement from the crude humour of the US. Men like dirty jokes more than women do and the Japanese love the absurd.

No wonder, then, that the world’s best joke can only be seen as the common denominator of jokes. This is it:

Two hunters go hunting and are walking through the woods. Suddenly, one of them grabs at his throat and collapses on the ground. The other panics and phones his on-call GP: “Doctor, I believe my friend is dead, what shall I do?” The doctor tells him “Calm down! First you must make sure that your friend is really dead.” There is a brief pause, followed by a gunshot. The hunter returns to the phone. “Ok, done. What do I do next?”



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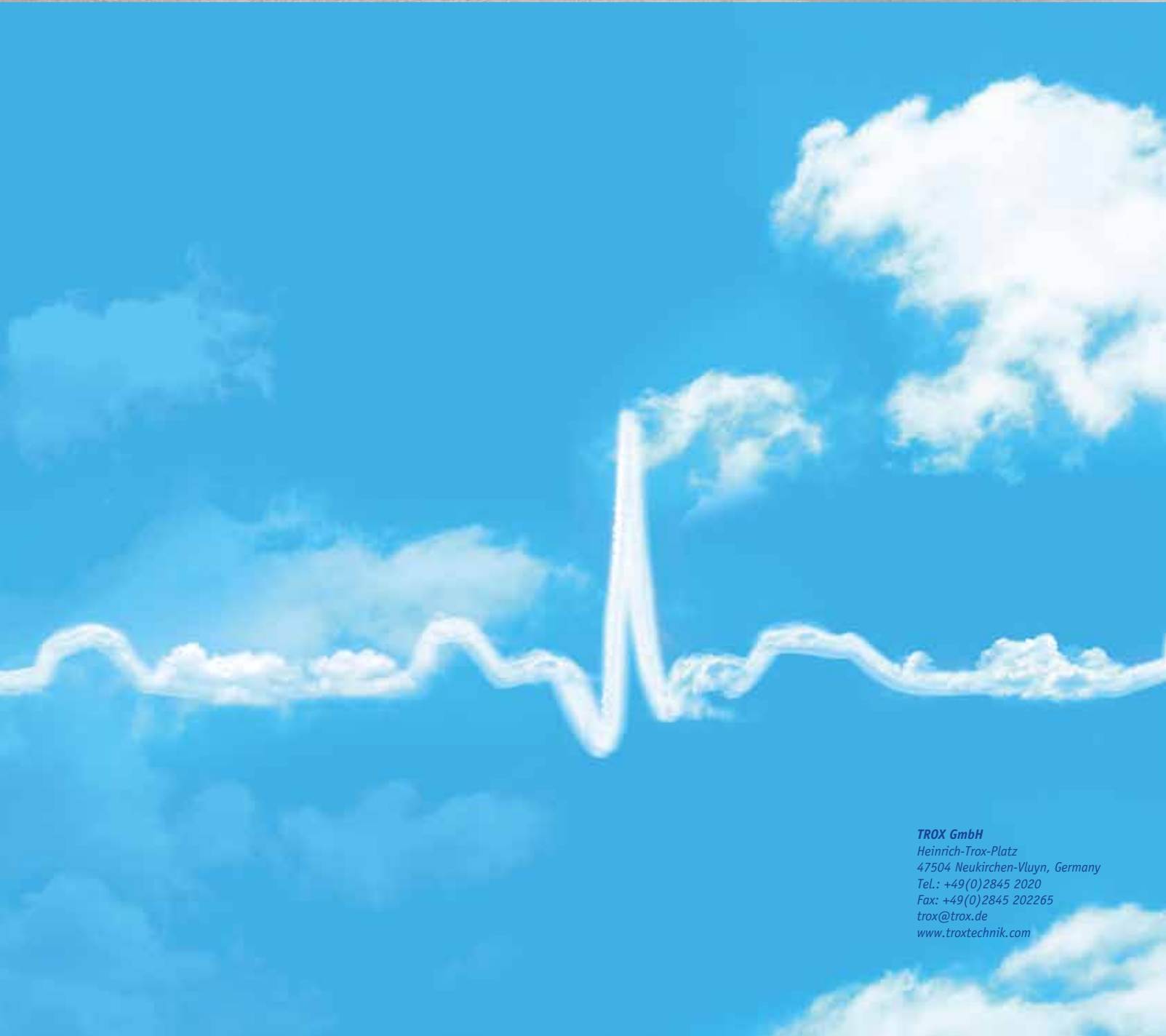
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