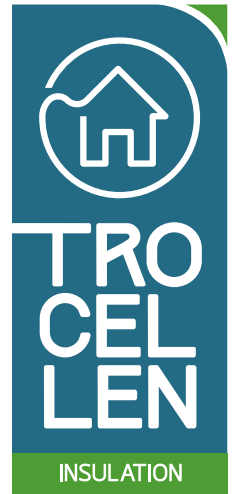


# Trocellen DataTec

Solutions for Data Center



Thermal - Acoustic Insulation



# Insulation Solutions for Data Center

## WHY INSULATION IS CRUCIAL FOR DATA CENTER?

In today's digital era, the rapid increase in data center is essential to support our growing need for data processing and storage. These facilities are crucial for various services, from streaming to online banking. However, maintaining optimal performance in data center is challenging, and proper insulation plays a vital role in ensuring efficiency and reliability.

Effective insulation in data center is crucial for thermal management, energy efficiency, and moisture control. It helps manage the significant heat generated by servers, reduces the need for excessive cooling, and prevents static electricity buildup and corrosion. Additionally, insulation aids in noise reduction, creating a quieter working environment, and enhances fire safety by containing potential fires and reducing flame spread.

Choosing the right insulation materials also contributes to the structural integrity of data center components, making them more robust and capable of supporting heavy equipment. As data center continue to expand, the need for reliable and efficient insulation become increasingly important to ensure these facilities operate at their best, safeguarding the data that powers our world.



## TROCELLEN INSULATION SOLUTIONS

**Trocullen DataTec** are a series of products for your data center insulation needs, including:

- fan wall system insulation
- hvac duct insulation

Known for its lightweight yet excellent insulation properties, Trocullen Solutions effectively reduce heat transfer and maintains stable temperatures within critical server rooms. They not only optimizes energy consumption by minimizing cooling requirements but also provides noise reduction benefits, ensuring a quieter and more efficient working environment:



## WHY POLYETHYLENE FOAM?

Effective temperature control is crucial for the optimal performance and longevity of technical systems. Rapid fluctuations in temperature, whether due to heat gain or loss, can cause wear and tear, fatigue, and even lead to equipment failures.

Polyethylene (PE) Foam insulation serves as a protective barrier against these temperature extremes, helping to extend the lifespan of equipment and minimize maintenance costs and downtime.

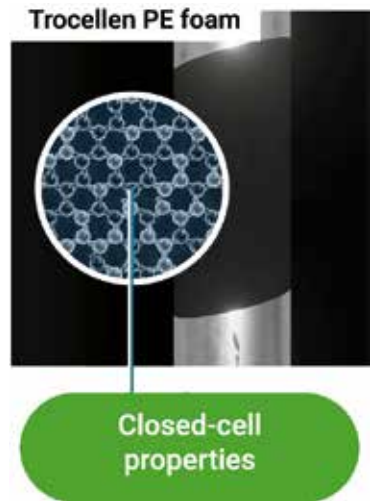
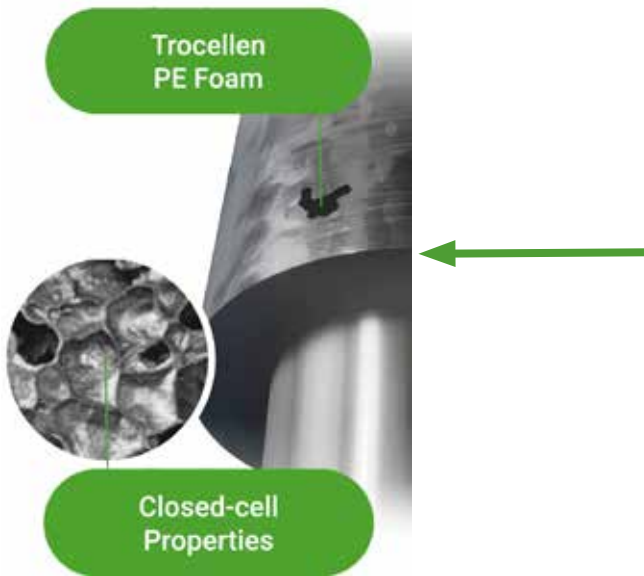
Its low thermal conductivity, fire-resistant properties, moisture resistance, and superior insulating capability—even in thin layers—make PE Foam an ideal choice for professionals seeking reliable insulation solutions.

### CLOSED-CELL INSULATION

The properties of closed-cell Polyethylene offer significant Insulation advantages for data center.

It doesn't shed particles, ensuring a clean environment which is essential for the optimal performance of sensitive electronic equipment.

It prevents dust and debris from accumulating on servers and other components, reducing the risk of malfunctions and ensuring high operational efficiency. These properties make polyethylene foam the ideal choice for maintaining a stable, reliable, and contamination-free environment in data center.



### PREVENT CORROSION WITH BUILT-IN MOISTURE BARRIER

Closed-cell Polyethylene (PE) offers superior protection:

It naturally repels water and provides high resistance to water vapor, reducing the risk of corrosion while preserving its insulating capabilities even if it becomes damaged.

### LOWER YOUR TOTAL COST IN THE LONG RUN

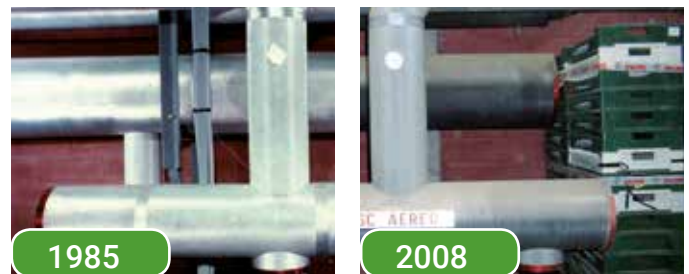
To minimize maintenance, repair, and associated costs, it is essential to prioritize the technical performance and dependability of the insulation material.

Unlike conventional insulation materials, Trocellen's PE Foam does not become brittle and absorb moisture over time, it is also resistant to chemicals, mold, and mildew. It can endure harsh conditions for decades while consistently delivering high performance and long-lasting reliability.

This reduces the need for frequent replacements or maintenance, providing a cost-effective solution for data center insulation.

One of our most compelling testimonials comes from Italy, where our PE foam was installed in 1985. Remarkably, after over 23 years of continuous use, the foam remains in excellent condition and performs just as well as the day it was installed.

Its impressive longevity suggests that it could continue to deliver exceptional performance for many more years to come.



PROPERTY	UNIT	1985	2008
Thermal Conductivity	W/mk	0,0394	0,0394

# TROCELLEN CLASS

## THE LINE OF INSULATION MATERIALS FOR VENTILATION DUCTS

Within Trocellen world for duct insulation, **TROCELLEN CLASS** means CE marked and Euroclass product portfolio, according to EN 14313.



By CLASS product range, Trocellen provides the answer in relation to the "new European approach" to customers of the professional application.

### Main advantages:

- Excellent condensation barrier ability
- Excellent  $\mu$  value – it can be even 15000 (depends on type)
- Constant and long lasting  $\lambda$
- Fire reaction, flammability classification can be Euroclass B; no afire dripping
- Ultra low toxicity and opacity of fumes in case of fire (F1 classification, according to FR F 16-101)
- Safe, non-toxic, non-allergen, mould resistant.

### Types:

#### TROCELLEN CLASS ADHESIVE

Chemically cross-linked, closed cell polyethylene foam.

- Euroclass B-s2,d0 – BL-s1,d0 for thickness range 3-12 mm.

#### TROCELLEN CLASS ALU ADHESIVE

Chemically cross-linked, closed cell polyethylene foam, laminated with aluminium sheet.

- Euroclass B-s2,d0 – BL-s1,d0 for thickness range 3-14 mm
- Euroclass C-s2,d0 – BL-s1,d0; thickness range: 15-24 mm.

#### TROCELLEN CLASS ALU.S ADHESIVE

Chemically cross-linked, closed cell polyethylene foam, laminated with aluminium sheet. With improved performances.

- Euroclass B-s2,d0 – BL-s1,d0; thickness range: 3-16 mm
- Weather tolerant insulation and usable even outdoor.

#### TROCELLEN CLASS G-PRO ADHESIVE

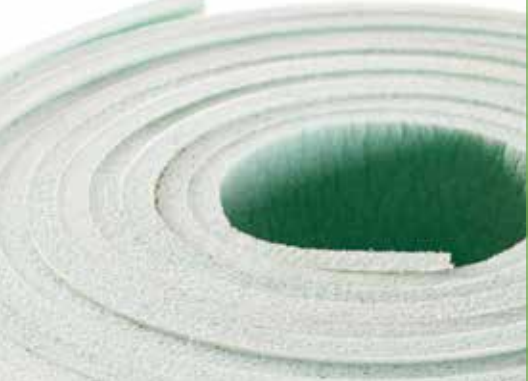
Chemically cross-linked polyethylene foam of grey color, with closed cells, with low thermal conductivity (0.0379 W/mK at 10 C °) and with high fire resistance performance. Covered with expandable graphite based coating.

- Euroclass B-s1, d0 - BL-s1, d0 for thicknesses 3-40 mm.

AIR DUCT



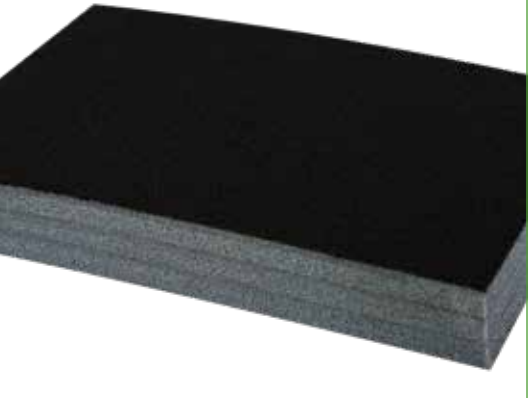
TROCELLEN CLASS ADHESIVE



TROCELLEN CLASS ALU/ALU.S



TROCELLEN CLASS G-PRO



## TROCELLEN CLASS RANGE

THICKNESS mm	ROLL SIZE m <sup>2</sup>	SHEET SIZE m <sup>2</sup>	TC CLASS ADHESIVE	TC CLASS ALU ADHESIVE	TC CLASS ALU.S ADHESIVE	TC CLASS G-PRO* ADHESIVE
03	75		X	X	X	
06	75		X	X	X	
08	75		X	X	X	
10	60		X	X	X	
12	45		X	X	X	
13	57,5	1,72				X
14	45			X		
15	45 (57,5 for G-PRO)	1,72 for G-PRO		X	X	X
16	30				X	
19		1,72				X
20	30	3		X		
24	22,5			X		
25		1,72				X
32		1,72				X
40		1,72				X

Roll width: 1500 mm ± 10 mm - \*: Roll Width: 1150 mm ± 10 mm

# SLEEVES

**TROCELLEN** is an insulating material produced with chemically cross-linked closed cell polyolefin foam (a group which includes PE, PP, copolymers EVA etc.).

**Available sleeves:**

**TROCELLEN N**

Chemically cross-linked foam without fire retardant additives.

**TROCELLEN P**

Chemically cross-linked foam, laminated with scratch resistant embossed polyethylene film.

**TROCELLEN AL**

Chemically cross-linked foam, laminated with scratch-resistant embossed metallic film.

**TROCELLEN AL/CL1**

Chemically cross-linked foam with fire retardant additives, certified Class 1, laminated with scratch-resistant embossed metallic film.

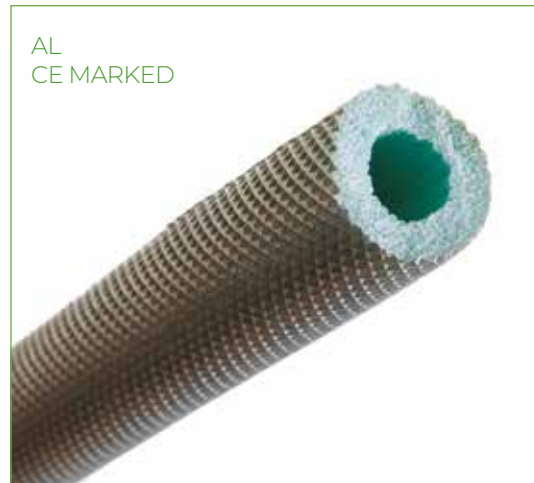
**TROCELLEN CLASS AL (CE marked)**

TROCELLEN CLASS means **CE marked** and **Euroclass** product portfolio, according to EN 14313.

Chemically cross-linked closed cell foam sleeves, colour light green, laminated with scratch-resistant embossed metallic film.

Other type available: **TROCELLEN CLASS P** sleeves, laminated with scratch-resistant embossed PE film.

Thicknesses: 6, 8, 12, 20 mm



## TECHNICAL DATA

TECHNICAL CHARACTERISTICS	NORM	UNIT	TROCELLEN N	TROCELLEN AL	TROCELLEN AL/CL1	TROCELLEN CLASS AL
Reaction to fire	UNI 8457 / UNI 9174 EN 13501-1		NA	NA	Classe 1	Euroclass D <sub>L</sub> -s2, d0
Thermal conductivity coefficient at 0 °C (λ-value)	EN 12667	W/mK kcal/mh°C	0,0345 0,0297	0,0345 0,0297	0,0345 0,0297	0,0360 0,0310
Thermal conductivity coefficient at 40 °C (λ-value)	EN 12667	W/mK kcal/mh°C	0,0400 0,0344	0,0400 0,0344	0,0400 0,0344	0,0450 0,0387
Water vapour diffusion factor (μ-value)	EN 12086 EN ISO 12572		≥ 2000	≥ 15000	≥ 12000	≥ 15000
Density	EN ISO 845	kg/m <sup>3</sup>	30	30	30	28
Thickness	EN ISO 1923	mm	6 - 8 - 12 - 20 (see base spec.)	6 - 8 - 12 - 20 (see base spec.)	6 - 8 - 12 - 20 (see base spec.)	6 - 8 - 12 - 20 (see base spec.)
Colour	Spec. BASE	-	anthracite grey	anthracite grey	light grey	light grey
Length		m	2	2	2	2
Compression stress at 10%	EN ISO 3386/1	kPa	24	24	18,6	13
Water absorption after 28 days	ISO 2896	Vol.%	<3	<3	<3	<3
Dimensional stability (< 5%)	ISO 2796	°C	100	100	100	90
Maximum operative temperature range		°C	-80÷ +100	-80÷ +100	-80÷ +100	-80÷ +90
Maximum operative temperature range with mechanical stress		°C	-40÷ +100	-40÷ +100	-40÷ +100	-40÷ +90

# THERMAL INSULATION FOR HEATING SYSTEMS

## AVAILABLE THICKNESSES

EXTERNAL PIPE DIAMETER (inches) (mm)		TROCELLEN SLEEVES N - AL - AL/CL1 - CLASS AL			
-	10	6	8		
-	12	6	8		
-	14	6	8		
-	16	6	8		
3/8	17,2	6	8		
1/2	21,3	6	8	12	20
3/4	26,9	6	8	12	20
1	33,7	6	8	12	20
1 1/4	42,4	6	8	12	20
1 1/2	48,3	6	8	12	20
2	60,3		8	12	20
2 1/2	76,1		8	12	20
3	88,9		8	12	20
3 1/2	101,6			12	20
4	114,3			12	20
5	140				20
6	168				20

Thicknesses are suggested in accordance with Italian current legislation: Law 09/01/91 n° 10 Pres. Dec. 26/08/93 n° 412

- underlay for heated floors and dividing walls
- external perimeter walls, skylights
- boiler rooms, cellars, garages, external piping, ventilation shafts



# ISOLMASS

## HEAVY LAYER PRODUCT

Under the APLOMB brand, **TROCELLEN** has been commercializing for many years a multi-layer product, with one or more sheets of lead, laminated with flexible insulating materials. Lead is not always readily accepted by installers and designers; which is why we have developed an alternative with a polyolefin heavy layer.

### BENEFITS

- FINISHING** Polyolefin-based multilayered products
- COMFORT** Noise reduction
- SAFE** Lead free
- VALUE FOR MONEY** High performance at low thickness
- APPLICATIONS** Suitable for walls, pipes and technical equipment

## ISOLMASS 3 TECH FR

- **Composition:**
  - (optional) ALUNET®: aluminium reinforced foil
  - heavy layer weighing **3 kg/m<sup>2</sup>**, thickness **1,5 mm**
  - layer of polyester fiber (PET), thickness **12 mm**, with 75% of post-consumer recycled-content according to ISO 14021
- **Size:** sheets **1,00 x 2,00 m**
- **Applications:**  
Sound insulation of drain pipes. The product must be installed with the polyester fiber in contact with the pipe. Wrap it around the pipe, apply adhesive tapes at the joints, and finally secure it mechanically with straps or plastic/metal clamps.
- **Acoustic properties:**  
Airborne sound and structure-borne sound insulation on waste water installations – Reduction of normalized airborne sound pressure level  $L_{an}$  (EN 14366), according different water flows:



ISOLMASS 3 TECH FR - INSTALLATION ON PIPE	WATER FLOW			
	0,5 l/s	1 l/s	2 l/s	4 l/s
$\Delta L_{an}$ - Airborne sound insertion loss [dB(A)]	12,8	11,3	10,6	10,2

- **Fire reaction:**  
EN 13501-1 Euroclass: B-s2,d0 / B<sub>L</sub>-s1,d0  
ISO 3575 100mm/min : Pass  
DIN 4102 Class B2: Pass

# ACCESSORIES

## SEALS - TAPES - STRIPS - GLUE

### TROCELLEN SEALS, THICKNESS 3-6 mm

These seals should be used to join metal elements (duct flanges, the edges of refrigeration cell doors and ventilation vents) to guarantee hermetic sealing and vibration damping. Acrylic self-adhesive.

Range:

- thickness 3-6 mm, types N and CL1

### ALUMINIUM TAPES (adhesive)

Aluminium tapes:

- thickness 50 µm, types embossed, smooth, self-adhesive (smooth or embossed), Duplex (with polyester film, improved tensile strength and adhesiveness)

### G-PRO TAPES (adhesive)

G-PRO technology expandable graphite tapes that are used to improve the technical and aesthetic finish of the insulation with Trocellen Class G-PRO in areas where the insulation is difficult to apply.

Range:

- 1 mm thick, self-adhesive

### TROCELLEN CLASS STRIPS

Suitable for the technical and aesthetic finishing of the insulation, they can be used for sections of piping where it is difficult to apply insulating sleeves and for joints between insulation sleeves and sheets which must be first glued with **MATIBLOCK**® glue.

Range:

- thickness 3 mm, types **TROCELLEN CLASS** adhesive plain and **TROCELLEN CLASS ALU** adhesive

Other not CE marked types available, according to the old Italian fire reaction classification:

SEALS



TROCELLEN CLASS STRIPS



# Sustainability

Sustainability is a very delicate and extremely important topic that is becoming increasingly popular in the developments of most of the industrial sectors (and not only) of the world.

Trocellen has great sensitivity on the topic and in last years has implemented a sustainable development policy regarding its plants/offices and also its products.

To guarantee and certify the sustainability of the Trocellen Class/Class G-Pro range, several studies have been carried out, listed below.

## LCA/EPD

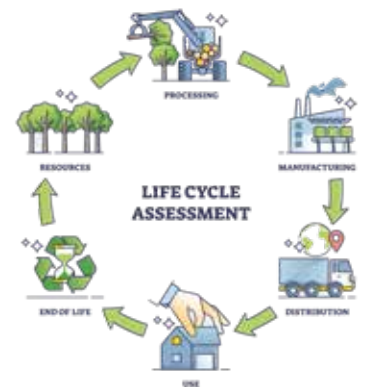
The LCA (Life Cycle Assessment) study is a quantitative analysis that evaluates the environmental footprint of a product throughout its **life cycle**, from the extraction of its raw materials to its final disposal.

Through this analysis it is possible to photograph the impact of the product on the environment, identifying which phases can be further improved in order to increase its sustainable aspect.

Starting from the LCA, which can be carried out voluntarily, it is possible to obtain a document called **EPD (Environmental Product Declaration)**, which takes up and expresses the environmental impact values obtained from the study itself by using different indicators (eg: Kg CO<sub>2</sub> emitted, ODP, etc.).

As evidence of its sensitivity to the sustainable aspect, Trocellen has operated in recent years to carry out an LCA/EPD study on various products, including the Class range.

The related EPD can be downloaded from the Environdec portal and allows you to use Class products in all those projects where environmental sustainability is a focal point required in the execution of the works.



## LEED

LEED® - Leadership in Energy and Environmental Design - is a voluntary building certification system born in America by the U.S. Green Building Council (USGBC) and currently applied in over 140 countries around the world.

The purpose of the certification is the promotion and development of a global approach to sustainability, giving recognition to virtuous performance in key areas of human and environmental health.

More and more projects in Italy and Europe are moving to obtain LEED certification and Trocellen was not caught unprepared; after several studies with expert consultants, the LEED categories for which the Trocellen Class ranges participate in the achievement of credits that identify the building classification (eg: Energy & Atmosphere, Material and Resources, etc.) have been defined.



Data center are buildings that can be LEED-certified (LEED BD+C: Data Center) to achieve the highest standards of sustainability.

Trocellen products have been LEED-mapped and can contribute to earning credits in specific categories—such as thermal insulation, acoustic insulation, Environmental Product Declarations (EPD), and indoor air quality when a project is pursuing LEED certification at the client's request.



**LEED v4 for BD+C: New Construction and Major Renovation**

Y	?	N			
			Credit	Integrative Process	1
<b>0 0 0 Location and Transportation 16</b>					
			Credit	LEED for Neighborhood Development Location	16
			Credit	Sensitive Land Protection	1
			Credit	High Priority Site	2
			Credit	Surrounding Density and Diverse Uses	5
			Credit	Access to Quality Transit	5
			Credit	Bicycle Facilities	1
			Credit	Reduced Parking Footprint	1
			Credit	Green Vehicles	1
<b>0 0 0 Sustainable Sites 10</b>					
Y			Prereq	Construction Activity Pollution Prevention	Required
			Credit	Site Assessment	1
			Credit	Site Development - Protect or Restore Habitat	2
			Credit	Open Space	1
			Credit	Rainwater Management	3
			Credit	Heat Island Reduction	2
			Credit	Light Pollution Reduction	1
<b>0 0 0 Water Efficiency 11</b>					
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
			Credit	Outdoor Water Use Reduction	2
			Credit	Indoor Water Use Reduction	6
			Credit	Cooling Tower Water Use	2
			Credit	Water Metering	1
<b>0 0 0 Energy and Atmosphere 33</b>					
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
			Credit	Enhanced Commissioning	6
			Credit	Optimize Energy Performance	18
			Credit	Advanced Energy Metering	1
			Credit	Demand Response	2
			Credit	Renewable Energy Production	3
			Credit	Enhanced Refrigerant Management	1
			Credit	Green Power and Carbon Offsets	2
<b>0 0 0 Materials and Resources 13</b>					
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
			Credit	Building Life-Cycle Impact Reduction	5
			Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
			Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
			Credit	Building Product Disclosure and Optimization - Material Ingredients	2
			Credit	Construction and Demolition Waste Management	2
<b>0 0 0 Indoor Environmental Quality 16</b>					
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
			Credit	Enhanced Indoor Air Quality Strategies	2
			Credit	Low-Emitting Materials	3
			Credit	Construction Indoor Air Quality Management Plan	1
			Credit	Indoor Air Quality Assessment	2
			Credit	Thermal Comfort	1
			Credit	Interior Lighting	2
			Credit	Daylight	3
			Credit	Quality Views	1
			Credit	Acoustic Performance	1
<b>0 0 0 Innovation 6</b>					
			Credit	Innovation	5
			Credit	LEED Accredited Professional	1
<b>0 0 0 Regional Priority 4</b>					
			Credit	Regional Priority: Specific Credit	1
			Credit	Regional Priority: Specific Credit	1
			Credit	Regional Priority: Specific Credit	1
			Credit	Regional Priority: Specific Credit	1
<b>0 0 0 TOTALS Possible Points: 110</b>					
Certified: 40 to 49 points, Silver: 50 to 59 points, Gold: 60 to 79 points, Platinum: 80 to 110					



THE TABLE ABOVE PROVIDES A LIST OF CREDITS THAT CAN BE OBTAINED THROUGH TROCELLEN PRODUCTS

**CAM**

The CAM (Minimum Environmental Criteria) are identified requirements that must be met by public and private infrastructures built on Italy in order to reduce the environmental impact of buildings.

Multiple Trocellen products are in line with CAM requirements and among these there is also the Trocellen Class range, thus allowing to satisfy the Italian legislation on new public and private building constructions



# Health & Wellness

Trocellen has always been attentive to people's health and well-being. For this reason, the products of the Trocellen Class range have been tested to evaluate two important health aspects:

- VOC (Volatile Organic Compound).
- Resistance to mold and bacteria growth.

## VOC

VOCs (Volatile Organic Compounds) are extremely volatile organic chemical compounds (low boiling point) capable of being released into the environment in the form of gas.

Many of these VOCs are harmful to human health if present above certain concentrations.

Some examples are benzene or formaldehyde, which are extremely harmful if inhaled through the respiratory tract.

Trocellen Class products have been tested for VOC emission and have reached the maximum classification A + with infinitesimal values and close to zero according to the French classification EN ISO 16000.

## MOLD AND BACTERIA RESISTANCE

Molds and bacteria are microorganisms capable of proliferating in environments where the ideal environmental conditions are found for their growth (quantity of oxygen, temperature, humidity, etc.).

However, their presence, in addition to ruining the functioning of the product itself, is also harmful to the health of the people in contact with it.

The products of the Trocellen Class range have been tested according to VDI 6022, obtaining maximum results regarding resistance to the growth of mold and bacteria.

In this way, performance is guaranteed for a long time, while maintaining people's health and well-being.

## WELL

WELL is a voluntary certification system for buildings similar to LEED, but with a greater focus on the well-being and health of the building occupants.

Just like for LEED, Trocellen Class products comply with various WELL requirements and contribute to the achievement of the credits necessary to have the building's classification level.

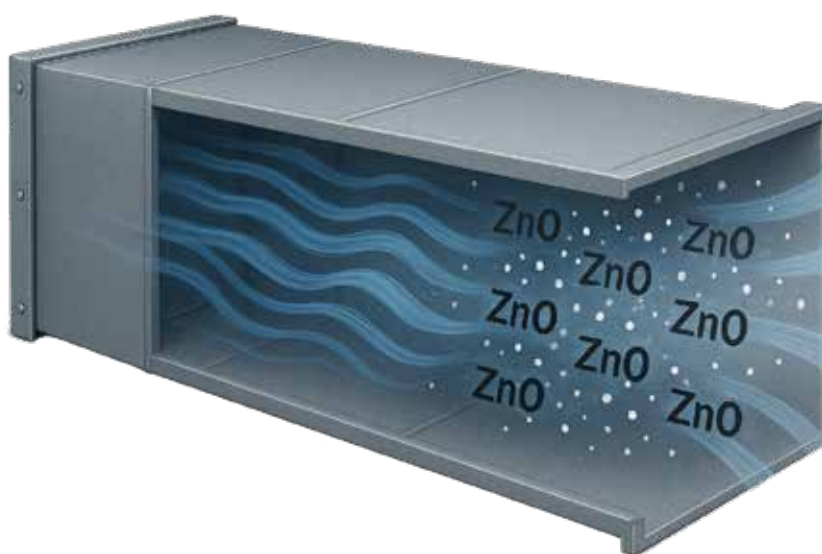
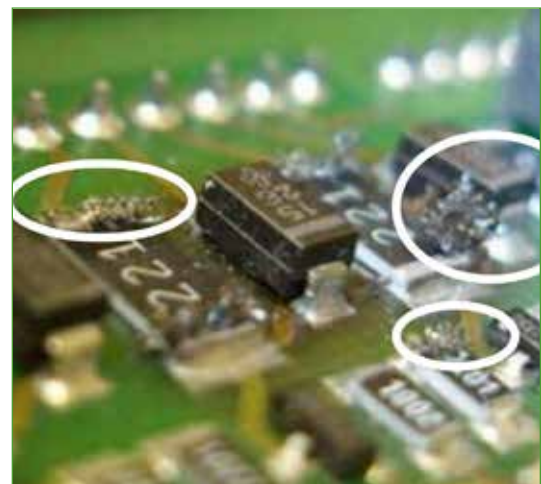


# Zink Whisker: Identification and Prevention

In HVAC (Heating, Ventilation, and Air Conditioning) systems, air ducts are commonly made of galvanized steel—that is, steel coated with a protective layer of zinc to enhance corrosion resistance.

However, over time, the continuous airflow inside the ducts can lead to the release of zinc particles. When these particles encounter oxygen in the air, zinc oxide (ZnO) may form.

Carried by the airflow, this oxide can settle on sensitive surfaces, such as electronic circuits in data center. Under these conditions, there is a risk of metallic whisker formation.



## Zinc Whiskers: Phenomenon and Implications

Whiskers are thin, needle-like or nodular metal crystals that grow spontaneously on metal surfaces, especially on coated metals such as tin and zinc.

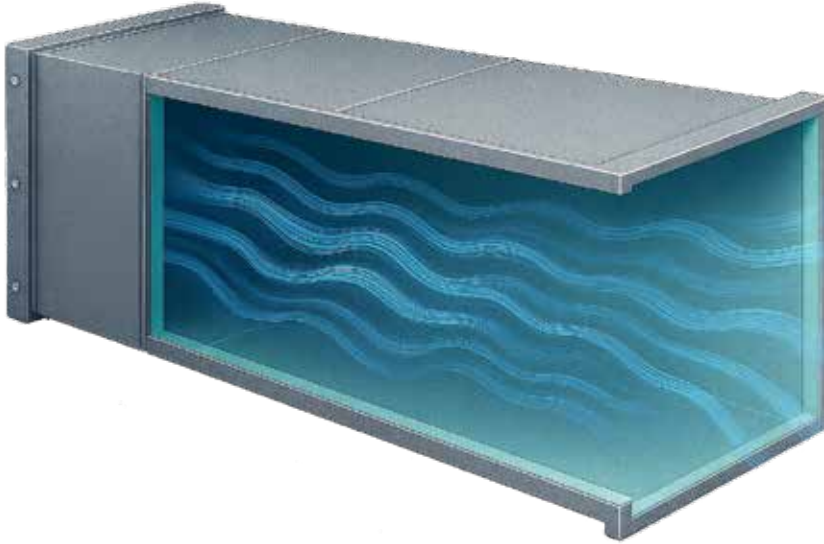
This phenomenon is known to occur under conditions of mechanical stress, corrosion, or environmental degradation of the metal coating.

Whisker growth can occur between the conductive traces of electronic circuits, with the potential to cause short circuits due to their electrical conductivity.

This represents a critical risk in high-density electronic systems—such as those found in data center—where even an unintended conductive micro-structure can compromise the functionality of devices

To mitigate the risk associated with zinc particle release and the resulting formation of metallic whiskers, our **Trocellen Class** product can be applied as a protective lining on the inner surfaces of air ducts.

It acts as an intermediate barrier between the galvanized surface and the moving airflow.



Applying **Trocellen Class** as an internal duct lining offers the following advantages:

- **Reduces direct exposure of the zinc coating to moving air**, thereby limiting oxidation and the subsequent formation of zinc oxide.
- **Creates a physical barrier** that prevents the detachment and dispersion of metallic particles.
- **Improves the reliability of HVAC systems** operating in critical environments—such as data center—where clean air and the protection of electronic equipment are essential.

This strategy offers an effective alternative or complementary approach to the use of non-metallic materials or the replacement of conventional ducts with advanced, low-particulate-emission solutions



# Trocellen DataTec Solutions for Data Center



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