

CLEANSULATION® TECHNOLOGY

VitroSilK®

Clean • Skin-friendly • Low-dust

High-temperature insulation without added basic oxides, which prevents the in situ formation of Chromium(VI) compounds.

THE BUILT-IN SYSTEM FLAW

Thermal insulation as a hazard to people and the environment

A CHP plant has to run, because only then does it earn money. Maintenance windows should take no longer than absolutely necessary, and they should certainly not have to be extended for occupational safety and environmental protection measures, because that lowers the efficiency of any plant.

CMR protection concepts for carcinogenic, germ cell mutagenic and reprotoxic hazardous substances from thermal insulation contaminated with Chromium(VI) are complex and cost time the operator does not have.

The installed insulation begins to decompose after just a few operating hours and forms Chromium(VI) compounds in situ. It is nevertheless paid for at OEM prices that bear no relation to its material value.

With "Removing the Known Flaw · Restoring Compliance", the **Chromate Experts** make sure the plant can be operated in compliance again; risk assessment and certified remediation plan included.

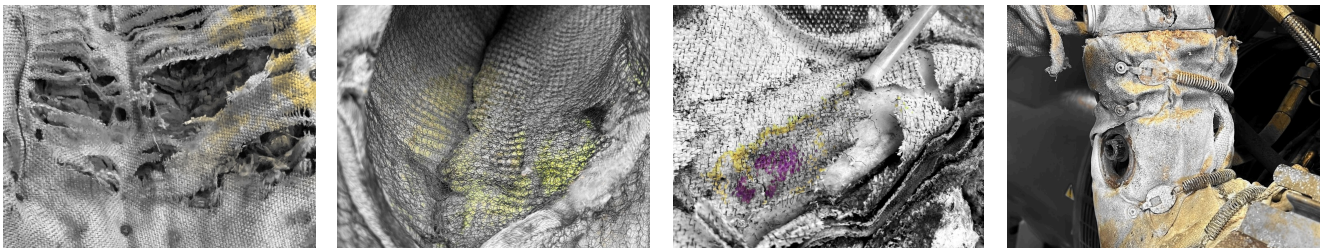
By **substituting** the existing, mostly calcium-containing thermal insulation with **VitroSilK®**, the innovative high-temperature insulation material without added basic oxides, the formation of Chromium(VI) compounds is prevented directly at the source.

This consistently implements the priority of **substitution** required by the national **hazardous substances regulations**.

Personnel trained and certified at the **cr6.academy** carry out the remediation once, during a longer overhaul.

The **Chromate Remediators** remove the old thermal insulation, dispose of it in line with regulations and decontaminate the engine and its surroundings according to the risk assessment prepared in advance.

The plant is now ready for the new **Cleansulation®Technology**, the insulation concept as a service contract.



CONVENTIONAL INSULATION AFTER REMOVAL · COLOR: YELLOW STAINING, PURPLE CHROMIUM(VI) RAPID TEST

Whatever is contaminated or can form chromates has to go.

Removal and disposal are not a choice but an obligation.

For decades, power-generating plants have been fitted with **insulation technology from the 1970s**. The materials used were never suitable for chromium-alloyed hot parts exposed to strong vibration.

During use, aging, wear and irritation of mechanically stressed materials produce hazardous dust: **carcinogenic, skin-absorbable chromates with chronic environmental toxicity** (Chromium(VI) compounds), which must be disposed of as **hazardous waste subject to labeling**.





CONVENTIONAL INSULATION AFTER YEARS IN OPERATION · YELLOW POWDER ON THE TURBOCHARGER HOUSING

Removal

Low-dust, under protective measures, with disposal as hazardous waste.

Decontamination

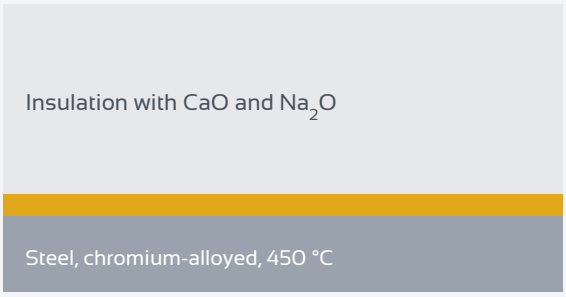
The hot parts are cleaned before the new insulation is fitted.

CLEANSULATION® TECHNOLOGY

The material makes the difference.

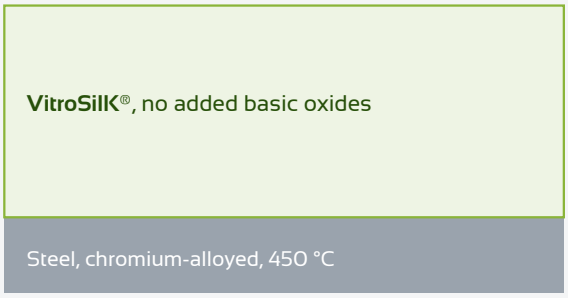
The name **Cleansulation®Technology** stands for **clean insulation** as a technical principle. Clean refers to the material itself. Conventional high-temperature insulation contains basic oxides, above all **calcium and sodium oxide**, which react to form chromates on chromium-alloyed steel from about 300 °C. **Cleansulation®Technology does without added basic oxides**, so the reaction partner for the in situ formation of Chromium(VI) compounds is missing. For service personnel, clean also means that the fiber causes no skin irritation.

CONVENTIONAL



Calcium and sodium chromate on the steel surface

CLEANSULATION®



no chromate formation

Clean

Binder-free, no organic binders.

No skin irritation

During installation and maintenance.

No Chromium(VI)

No reaction partner in the insulation.

ENGINES, TURBOCHARGERS, EXHAUST LINES

VitroSilK®Kavar

Each insulation element is made to measure from a scan or a drawing; cutting patterns already exist for many industrial engines. The so-called "blankets" can be removed and reused.



0	750 °C	2 years	custom fit
added basic oxides	continuous service temperature	warranty	can be refitted

FIRST LAYER

VitroSilK®Mat

The classic in a new guise – the so-called box mattress without added basic oxides. Sewn on all sides from **VitroSilK®Shield**, filled with **VitroSilK®Fill**, in insulation thicknesses of 30, 40 or 50 mm. No basic oxides – no in situ formation of Chromium(VI) compounds.





VITROSILK® ON EXHAUST LINES IN THE ENGINE ROOM · PHOTO AND DRAWING

30 mm
thickness

40 mm
thickness

50 mm
thickness



VITROSILK®SHIELD · FABRIC WITH A TWISTED-IN STAINLESS STEEL CORE OF 1.4845

One fiber, one system.

Amorphous high-silica continuous filament glass fiber, fiber diameter 6 to 9 µm, binder-free.
One fiber as the basis of all VitroSilK® products.



Flex
Needle mat, 5 to 25 mm, 1000 mm wide.



Fill
Chopped fiber as filling for the VitroSilK®Mat cushions.



Shield
Fabric with a twisted-in stainless steel core for the hot side.

Optionally with KavarMesh, abrasion protection of knitted wire mesh 1.4571 on the hot side.



THERMAL INSULATION GUARANTEED

CHP insulation as a service contract.

The heat protection of the past has remained at the technical level of the 1970s, while everything on the plant side has moved on. Such protection is no longer enough for what a high-performance power-generating system demands today; it has to do more than the insulation it was once designed as. **Cleansulation®Technology** not only provides safety for people and machines, it also stands for innovative performance and keeps the heat where it is needed. What wears out is replaced, and the insulation stays up to date, as with the service contract for the genset itself.

Extended warranty
Under the service contract, insulation becomes a service and is not simply purchased as material.

Assured functionality
at the efficiency of today's insulation technology.

Replacement when worn
What wears out is replaced (leaks and external damage excepted).

Always state of the art
Time for different, time for better.