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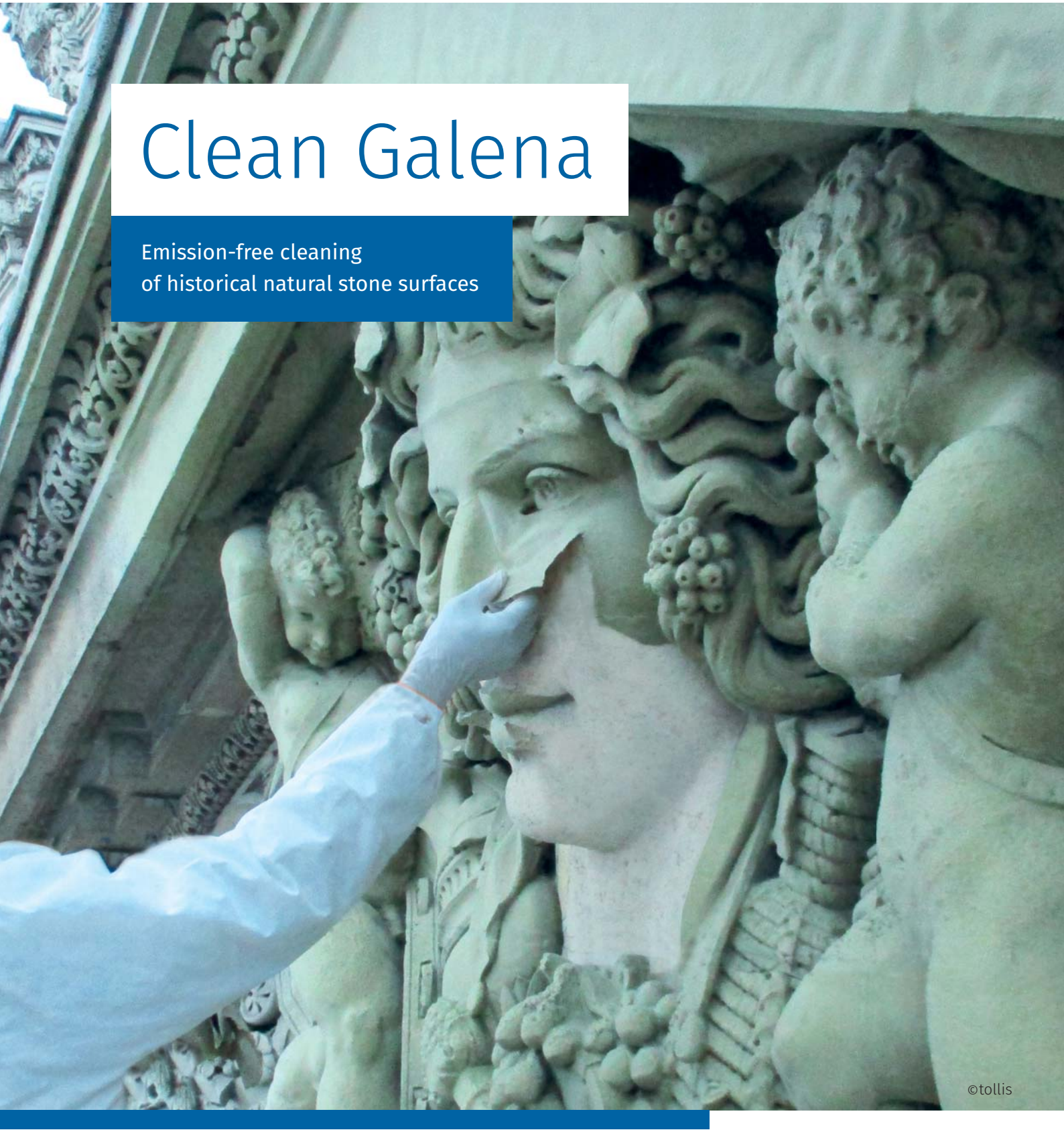
Clean Galena

Emission-free cleaning
of historical natural stone surfaces



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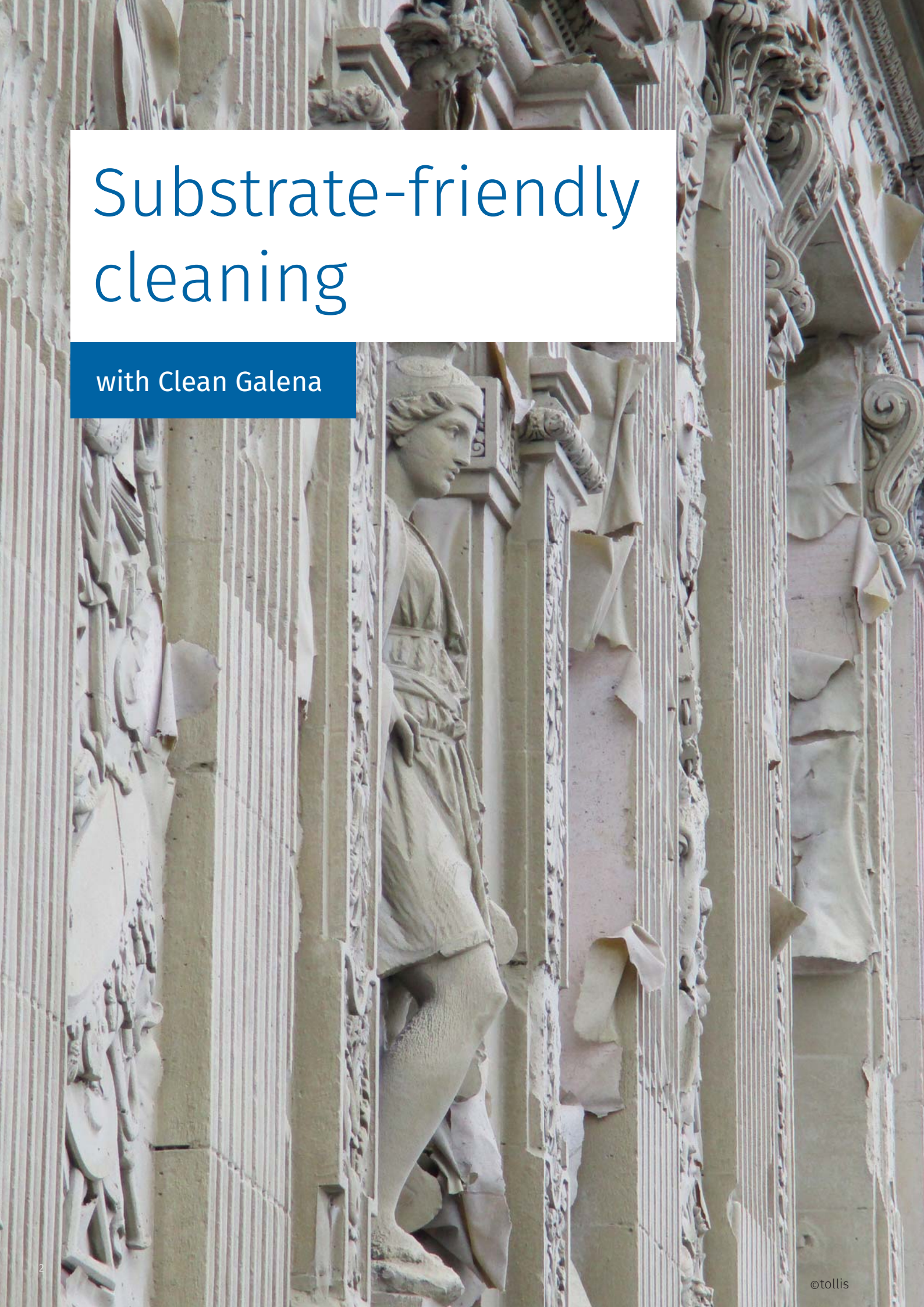
Substrate-friendly cleaning

with Clean Galena



As a general rule, there may be aesthetic or technical reasons why a building needs to be cleaned. Although the aesthetic reasons play an essential role when deciding whether cleaning is necessary, it is difficult to look at these from an objective perspective. However, it is a different story for the technical reasons, the main one being that dirt deposits usually attract moisture and harmful substances while slowing the speed at which the substrate dries. This means that the stone surface remains damp for longer, allowing the associated harmful processes to have a greater impact.

Every time cleaning is carried out, it must also be borne in mind that this intervention itself comes with risks, namely damage to the building structure or the release of built-up harmful substances. With Clean Galena, these risks can be minimised.

Typical dirt build-up on facades in urban areas that needs to be removed during cleaning is usually caused by deposits of particles suspended in the atmosphere, such as dust, diesel exhaust, particles from tyre and brake abrasion, iron dust from railways, and so on. They often contain heavy metals and can react with the stone structure, damaging the original surface. Many natural stone types also face the problem of dirt particles being incorporated into gypsum that is formed on the stone surface as a secondary effect.

Every case requires carefully chosen cleaning processes that can reduce or even remove the dirt and release as few harmful substances as possible while being gentle on the substrate – in other words, the original structure.
There are many ways in which Clean Galena can help to tackle this challenging task.

Types of contamination
Layers of dirt are usually the result of a process spanning many years. Various substances are deposited on or in the pores of the surface, or layers of dirt form due to changes originating in the substrate itself.

Loose dirt and dust
In such cases, deposits on the surface can simply be removed mechanically.

Urban dirt
This is usually dirt that is difficult to remove and is often made up of mixtures of dust, soot, oil, grease etc. that may also contain heavy metals.

Algae, moss, lichen, fungi
Biological contamination can usually be removed using superheated steam, which usually causes little or no damage to the historical surface.

Higher plants
Higher plants always have to be completely removed via mechanical means. A “miracle agent” that kills and breaks down roots that have grown into the masonry is not known to date.

Efflorescence
Readily soluble, damaging salts that move to the surface as moisture dries up can be swept off or drawn off with a vacuum. The building material usually also contains other salts that cannot be removed using conventional cleaning processes.

Leaching/sintering
In contrast to efflorescence, this is made up of poorly soluble salts, often calcium carbonate, that can be removed using acidic cleaning agents or, if they are present in thick layers, via mechanical means.

Graffiti
Spray paint and permanent marker ink are usually very difficult to remove, as they penetrate into the pores of the substrate. In most cases, they will need to be chemically stripped from the building material.

Conventional cleaning methods

The various cleaning methods can be roughly categorised into mechanical and chemical processes.

A major disadvantage of many mechanical cleaning methods is that they generate dust, which by nature contains a great deal of harmful substances that have accumulated on the facade and are therefore released into the atmosphere.

A drawback to chemical cleaning is the large amount of water that is introduced into the substrate. Furthermore, cleaning agents may react with the binder in the substrate and form salts.

While standard chemical cleaning methods require a great deal of water, this is usually optional in the case of mechanical processes. Wherever water is used, this can lead to interactions with constituents in the substrate, which may mobilise salts, for example. In addition, nowadays the water used must always be collected and subjected to an extensive treatment process so that the harmful substances dissolved in it are not released into the environment.

Furthermore, many “conventional” cleaning methods carry the risk of being unsuitable for the substrate, causing damage to the valuable original structure.

These are all risks that are eliminated when cleaning with Clean Galena.

A special cleaning method

Clean Galena

In recent years, awareness surrounding the emissions that may be released when cleaning facades has grown, and rightfully so. In particular, the question of whether the cleaning process will cause heavy metals in any form to escape into the atmosphere is subjected to close scrutiny.

A good method of suppressing polluting substances during the cleaning process is to use cleaning compresses.
These are paste-like cleaning agents that contain a carrier material and active cleaning substances. When applied, they dissolve impurities in the substrate, which are taken up unto the compress together with the solvent used, where they are bound. Once the cleaning process is finished, the compress will be almost completely dried out.

These pastes can be used with a range of different active substances, e.g. for removing tar stains, rust spots, gypsum crusts, greasy deposits, heavy metal residues, etc.
The advantages:

- Little moisture applied to the building structure
- No dust
- No emission of harmful substances
- Harmful substances are bound in the compress and are thus easy to dispose of

Clean Galena is one such emission-free cleaning compress. It contains no ammonium carbonate nor EDTA. Various readily biodegradable complexing agents that are used in the food industry (substances that can bind various metal ions, such as

iron, copper, lead and other heavy metal ions) are used as active agents. They are combined in a manner that further increases the cleaning effect of each individual active ingredient. The carrier material is bentonite, a layered silicate that binds various dissolved substances and colloids through adsorption and electrochemical processes. It also regulates moisture transport during the cleaning process, with the help of a small amount of cellulose. After one day – or a little longer at very low temperatures and high humidity – the compress will dry out and detach from the substrate. Once removed, the dried material must then be disposed of according to the applicable local regulations. Here, it is only the dirt removed from the facade that needs to be considered, not the compress material itself.

So far, the material has been used successfully on exceptional buildings such as the Louvre in Paris and Westminster Palace, including the Elizabeth Tower (Big Ben), in London.
In addition, diverse laboratory tests have shown that Clean Galena possesses high potential for cleaning not just natural stone substrates but also contaminated bricks.

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