tubag

Building on secure and ecological foundations

original tubagTrass

Naturally ... with original tubagTrass.

Ein Unternehmen der quick-mix Gruppe

Times have changed.

Ecological responsibility – underpinning our actions.

In today's society, our sense of responsibility towards our natural habitats has increased significantly. Each individual feels more and more responsible for our environment.

Building with original tubagTrass – building on a sense of ecological responsibility.

This new sense of responsibility pervades every area of human activity. Thus, there is an increasing demand for future construction projects to utilise sustainable and environmentally-friendly building materials. The building material trass, a natural product, is not only natural and environmentally-friendly, but also fully meets increasingly stringent structural engineering requirements. Thus, trass is a tried and tested material and component which is natural, sustainable and built to stand the test of time.

Original tubagTrass – meeting ecological and economic structural requirements.

Original Rhineland tubagTrass fully meets the current ecological and economic requirements of modern-day buildings. Original tubagTrass has all the qualities required to ensure reliable and economical use when building from scratch, as well as when renovating and restoring our built environment.

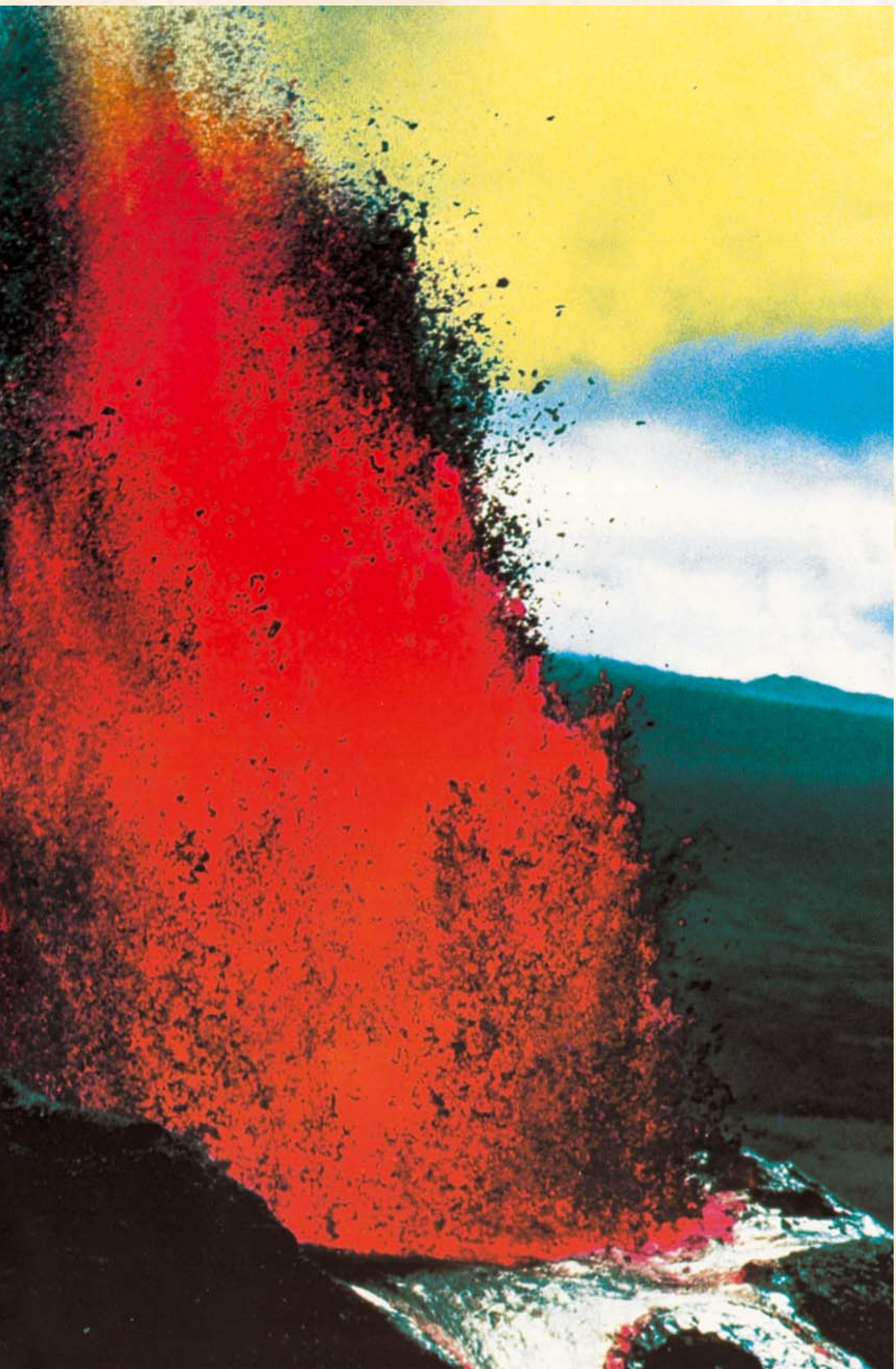
Trass – an absolutely natural building material.

Trass, a natural product, is a finely ground volcanic igneous rock comprising a high proportion of free silicic acid, various minerals and both chemically and physically bound water. The Dutch gave us the term 'trass', which derives from the Italian word 'terrazzo' ("cement floor"). Terrazzo, in turn, has its root in the Latin 'terra' ('earth').

Original Rhineland tubagTrass

Trass – an ideal binding agent.

While trass itself does not cure, when combined with lime or cement it produces a binding agent with superb technical mortar attributes. Lime mortars containing trass cure not only as a result of absorbing carbon dioxide from the atmosphere, but also in conjunction with water. Thus, for example, even the Romans were able to build underwater structures. Trass is a completely natural raw material, and thus poses absolutely no risk of environmental damage or deterioration. But trass is not simply 'just another additive': it also acts as an enhancing agent, exponentially improving the full range of the building material's physical attributes.



tubagTrass originates from the volcanoes in the Vordereifel region

Trass: The history of a natural product.

The earliest buildings: Pre-history, proto-history.

We know from the very beginnings of architectural history that lime was used as the first mineral binding agent. The oldest lime renders which can be historically verified can be traced back to the Mesolithic era and are over 7,500 years old.
However, it soon became apparent that conventional lime mortar – which only cures when exposed to air – lacked strength, causing early builders to search for suitable additives which would improve structural strength, stability and resistance, while also allowing construction in and beneath the water.

Trass in Antiquity.

The Greeks, Phoenicians and Romans were the first who were able to build harbour structures which extended far below the water's surface. Special mortar additives ensured the strength of these underwater structures, some of which still exist today.
A construction manual by the Roman master builder Vitruv, dating back to the first century BC, shows that – during an era when monumental architecture was gaining in importance – brick dust and volcanic ash were added to trass, then used as a binding agent. The island of Santorini and the area around Puzzoli thus became known as excavation sites, and were heavily used to produce so-called 'Pozzolana'. The unique properties of "Pozzolana" subsequently ensured that it became an important component in Roman architecture. Structures such as the Pantheon, the Coliseum, the Castel Sant'Angelo, Hadrian's Mausoleum and countless viaducts have thus braved the elements - not to mention environmental pollutants - for two millennia.

Exploitation of new deposits in the Rhineland.

As the Roman Empire expanded to the Rhineland, the Romans – already familiar with pozzolana – sought suitable mortar additives locally. They found them in the volcanic Eastern Eifel region.

Trass at the end of the Middle Ages.

Towards the end of the 16th century, the Dutch – aware of the superb binding qualities of trass - increasingly looked back to the Romans and their knowledge of construction material technology gained over a thousand years. The Dutch used this experience to ensure that structural components, as well as buildings and canal networks, were lastingly protected from environmental impacts such as damp and the effects of water. During this period, the Dutch term 'trass' became commonly used to denote the high-quality pozzolana from the Eastern Eifel region.

Ponte Sant'Angelo in Rome

Trass in the modern era.

During subsequent centuries, the increasingly widespread use of concrete went hand-in-hand with continued use of trass, which renders concrete suppler and easier to use. In an era when concrete was compressed by manual treading, trass also enabled denser concrete to be produced - an important consideration. In an age of industrial production, it also made sense to mix the cement and trass by grinding them together in the factory, ensuring a more homogenous mixture than could be obtained by simply adding the trass when mixing the mortar and cement.

Trass – past experience, future prospects.

Today, it is impossible to imagine a professional, future-centred construction philosophy without the use of trass, trass cement, trass lime and the mortars produced with them: after all, these substances have unique qualities. Whether we look back to the ancient Roman architects, whose legacy can still be admired two millennia later, or we look at contemporary buildings, one thing is clear: one cannot but be impressed with the superb and incomparable qualities of trass as a building material.

Print media academy in Heidelberg

Mortars utilising original tubag
→ Decisive benefits on which

→ Mortars with trass – an absolutely natural building material

Rhineland trass is a natural, pozzolanic trass from the Eastern Eifel region that is prepared for use by grinding treated tufa. The Eastern Eifel volcanic region comprises around 100 volcanic centres. The volcanicity dates back to around 650,000 years, and concluded with the massive Laacher Lake eruption around 11,000 years ago.

Trass – a high-reactivity building material

The reactivity of trass is based on its chemical composition and is enhanced by fine grinding. Trass alone will not cure, but, when used in combination with lime hydrate, hydraulic limes or cements, it becomes a binding agent with superb mortar technology features.

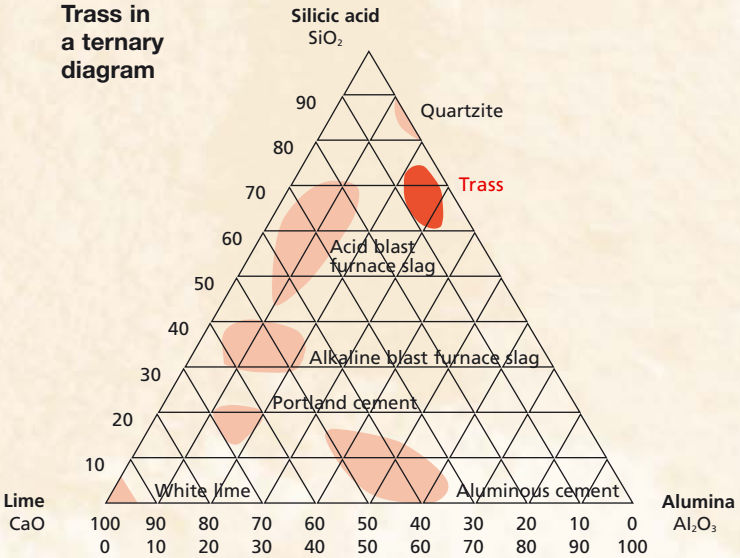
Trass – a building material with alkalis

The alkalis (mainly sodium and potassium sulphate) contained in the natural substance 'trass' are bound during the curing process, and – once the substance has cured – are only separable in small concentrations. Provided that the correct formulaic geometry is used, the alkalis remaining in the building material will not have any adverse effects.

Trass – the chemical analysis

Ignition loss	Ign. L.	6.00 %
Silicon dioxide	SiO_2	56.90 %
Aluminium oxide	Al_2O_3	18.50 %
Titanium dioxide	TiO_2	1.10 %
Iron dioxide	Fe_2O_3	6.30 %
Magnesium oxide	MgO	2.20 %
Manganese oxide	Mn_2O_3	0.20 %
Phosphorous oxide	P_2O_5	0.20 %
Calcium oxide	CaO	5.20 %
Sulphuretted hydrogen	SO_3	0.20 %
Potassium oxide	K_2O	5.70 %
Sodium oxide	Na_2O	3.50 %

Trass in a ternary diagram



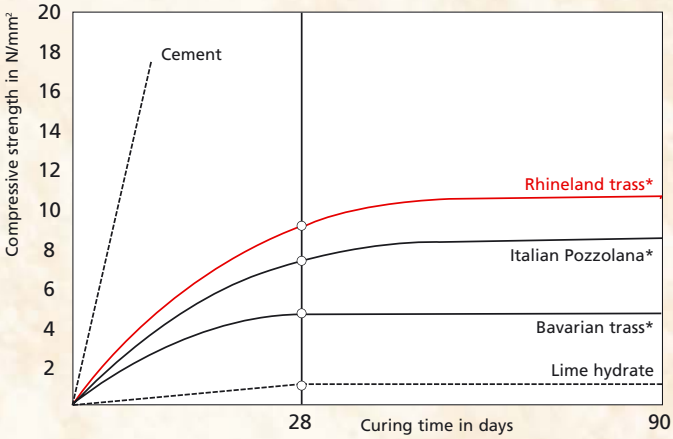
→ Mortars with trass – are stress-free

The strength gradient of mortars or binding agents containing trass continuously increases over an extended period, with a relatively low total strength level when compared with cement-based products.

Thanks to modern building materials technology, the strength gradient in building materials containing trass is such that – even with the addition of trass – the building materials have controlled early and final strength levels, determined by the site requirements in question.

The diagram clearly shows that the use of trass in mortar facilitates a targeted strength gradient. The strength gradient, and the final strength of the trass mortar, depends on the trass used and the mortar formula in question.

Compressive strength of lime pozzolanic mortar in 90 days



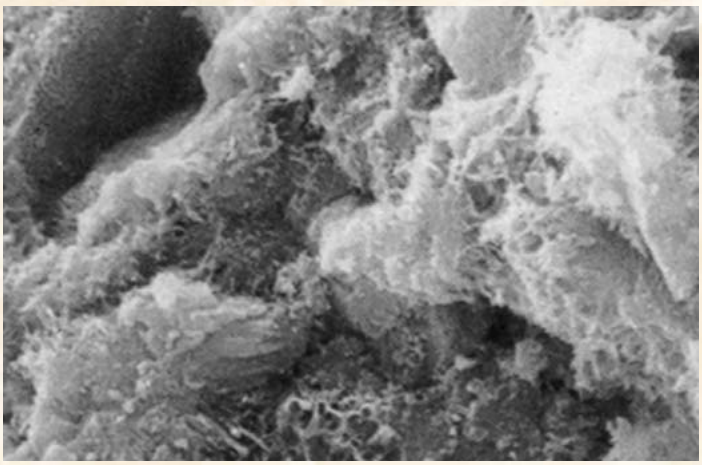
* Mixing ratio with lime hydrate 1:1

Trass.
you can build.

→ Mortars with trass – are highly resistant to aggressive environmental factors

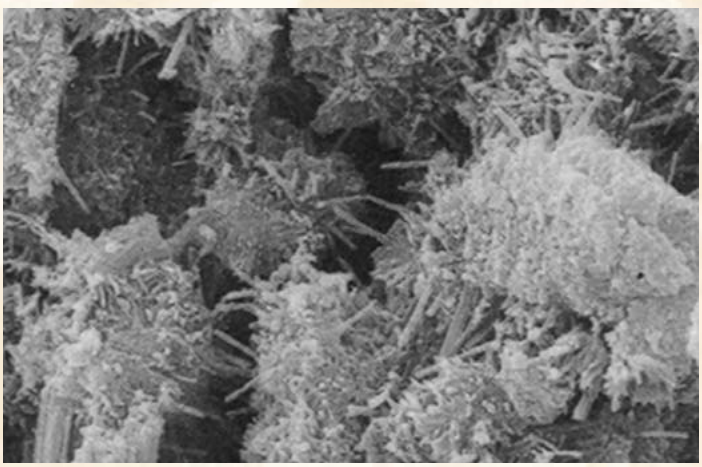
Older and historic buildings are especially vulnerable to environmental stresses. Acid media are the primary aggressive environmental influences.

In the case of building materials containing trass, the lime potential is almost fully bound during the curing process. The lime particles are protected from acid attacks as though enveloped by a protective shell. This means that mortars containing trass have a denser molecular structure, thus offering a smaller surface area vulnerable to attack by substances which may cause structural damage.



W. Dyckerhoff Institut

Scanning microscope image: mortar structure of trass cement



Scanning microscope image: mortar structure of Portland cement

→ Mortars with trass – are highly water-tight

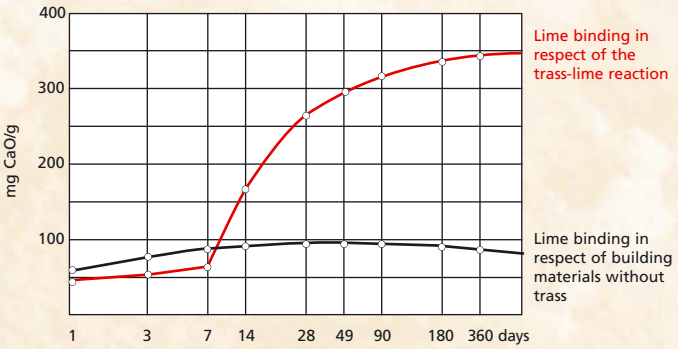
Due to the trass-lime reaction in the building material containing trass, the capillary pore space is altered during the curing phase in such a manner that the capillary water transport is severely restricted. Although trass cement concrete, or mortars containing trass, are not waterproof, when compared with other building materials they do have the ability to severely impede capillary water throughput. That is why, even in antiquity, mortars containing trass were used for aquatic structures and water pipelines. These structures retain their functionality today.

High levels of water tightness: partial section of a Roman water pipeline

Mortars utilising original tubag
→ Decisive benefits on which

→ Mortars with trass – have high lime binding levels to combat lime efflorescence

Together with the mortar gauging water and any additional moisture, the free lime particles in mineral building materials can cause unsightly efflorescence. Mortars containing trass are able to bind these free lime particles during the curing process. Once bound in this manner, it is almost impossible for the free lime to be transported together with the water through the capillary structure modified by the trass. Thus, lime efflorescence outside the building material is almost completely eliminated.



→ Mortars with trass – prevent natural stone discoloration

The addition of trass modifies the capillary structure of the mortar, preventing capillary moisture transport. Substances which could promote discoloration are bound within the building material, thanks to the trass-lime reactions.

The difference is visible:

1) Without trass

Water is added to the binding agent when mixing the mortar. As a result, substances containing lime in the gauging water enter the solution, rendering it highly alkaline. As a result of the high alkalinity, the colourless organic and metallic substances present in the mineral deposits darken, as is clearly shown in Fig. 1.

2) With trass

The presence of trass in the mortar regulates the free lime, thus preventing unsightly discolorations, as can be seen in Fig. 2.

Trass.
you can build.

→ Mortars with trass – are very supple

The high fineness level of trass, as well as the high water retention value, ensures that mortars containing trass are extremely easy to use. Thus, all products to which trass has been added are of excellent and consistent quality, while also bonding very well to the substrate. Thus, as far as users are concerned, mortars containing trass represent a natural alternative to chemically-treated building materials.

Supple and easy to use … thanks to trass

→ Mortars with trass – regulate the atmospheric environment

It is impossible to imagine today's residential building sector without the use of building materials containing trass. This is primarily because – together with other appropriate building materials – trass improves the atmospheric environment, largely due to its advantageous capillary structure. High levels of humidity absorption, together with excellent humidity discharge attributes, can be relied on to ensure a pleasantly constant and healthy living environment.

The options are almost limitles thanks to original tubagTrass.

In addition to its unique material features, the primary advantage offered by trass is its versatility, especially when dealing with difficult areas of application.

When renovating and restoring,

old and historic buildings, the use of tubag mortars and renders containing trass ensures high levels of resistance.
The tubag product range, which is based on lime and trass, is ideally suited to old masonry, offering optimal security. At the same time, tubag products offer the advantage of efficient application using state-of-the-art equipment.

When carrying out tiling work,

tiling adhesives containing trass make it easy to lay natural stone or ceramic slabs in the adhesive bed. The adhesive is non-sag, thanks to the trass content, ensuring that work progresses rapidly. Specially designed trass adhesives even facilitate optimal laying where significant cladding material tolerances occur. Trass also reduces the inner friction within the fresh mortar, resulting in improved compressibility and a homogenous structure.
Thin bed tiling adhesives containing trass are particularly suitable for laying slabs.

ss –

When plastering,

trass mortars containing selected sands are especially suitable for use with insulating walling materials vulnerable to crack formation. In addition, they are highly suitable for interior and exterior renders, as well as for renders in cellars, wet-duty rooms, garages, works halls etc. Trass mortars regulate humidity and have a beneficial effect on the atmospheric environment.

When bricklaying,

trass renders the mortar suppler, exceptionally dense and – thanks to the high level of suppleness – is easier to use.

When laying clinkers

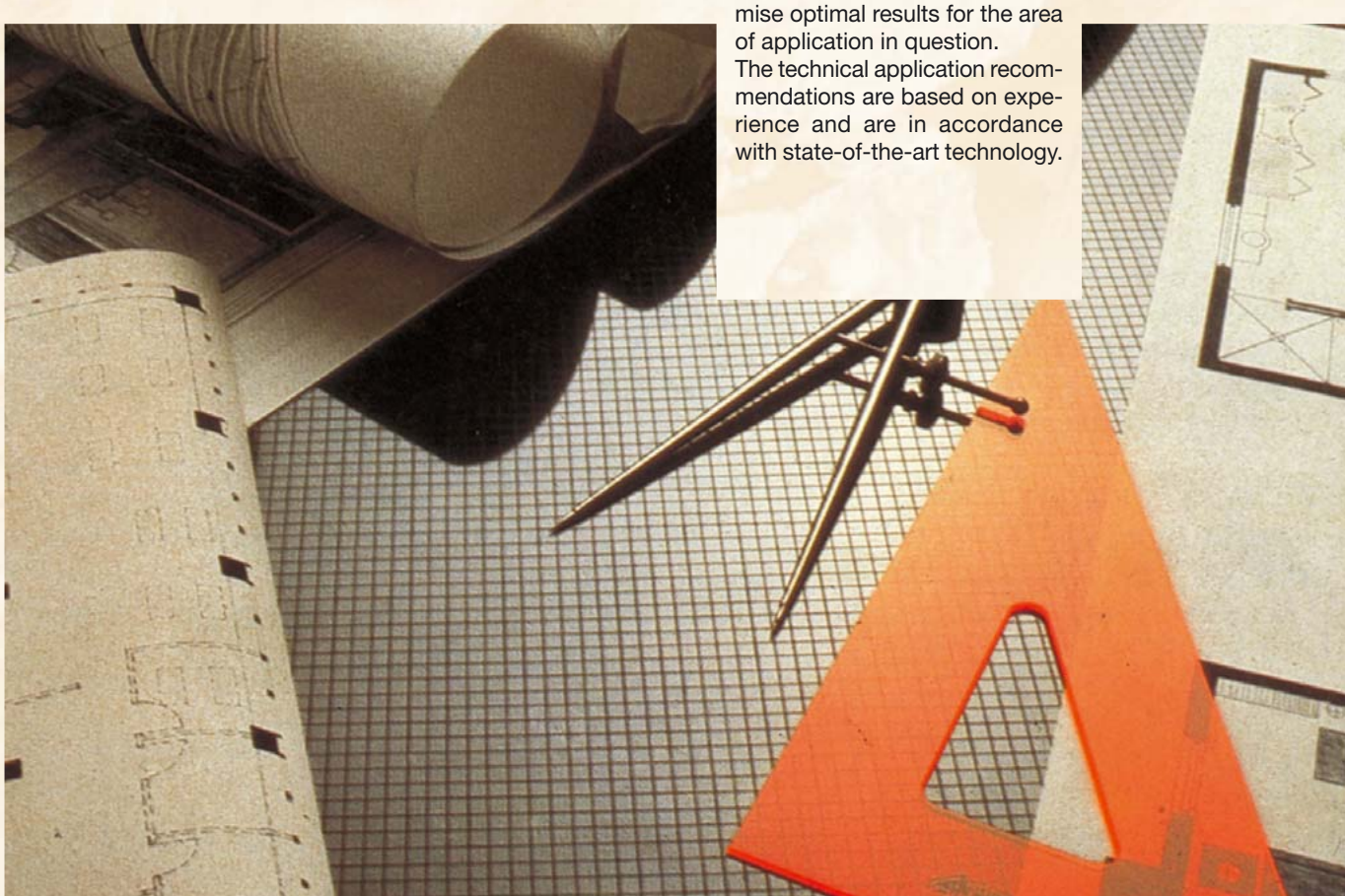
on exposed masonry, the use of mortar containing trass preserves the appearance of attractive architectural details.

Would you like to know more?
If you would like further details, please request our product information on the relevant area of application.

Trass: meeting tomorrow's challenges

Quality – that's what tubag products are all about. Thanks to tubag quality, users can rest assured that they have created something of lasting value. To ensure that they derive optimal benefit from the special features of Rhineland trass, tubag binding agents and mortars contain the highest possible proportion of trass. Naturally, all tubag products comply with current applicable standards, and even exceed the standard requirements in many respects.

All tubag products are subject to stringent internal and external monitoring. State-of-the-art manufacturing technology, ongoing R&D activities and technology-intensive production controls all contribute to improving product features while ensuring that the natural attributes of trass are preserved. When properly used, tubag trass products promise optimal results for the area of application in question.
The technical application recommendations are based on experience and are in accordance with state-of-the-art technology.



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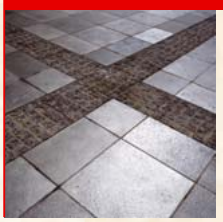
The tubag range at a glance.
Naturally with original tubagTrass.

Trass binding agents

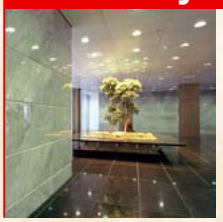


Trass cement
Trass lime
Trass dust

Trass mortars

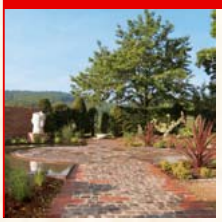
Trass-lime mortar
Trass-cement mortar
Natural stone tiling adhesive

Laying natural stone



Thick-bed
Medium-bed
Thin-bed
Grouting

Hard Landscaping



Bedding
Jointing

Renovating and restoring

Bricklaying
Pointing
Plastering
Filling/sealing

We will be happy to advise you

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