



# Enter - the small molecules

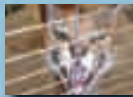
*PSS Technologies provide durable protection for high grade materials; natural stone terraces for instance. 'New, improved paving protection' means value retention for property owners and a clean first impression for guests and passers-by.*

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Durable protection for white limestone

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A question of hygiene

# First impressions count

All involved in facility management are aware of the importance of protection, upkeep and value retention of mineral, absorbent building surfaces due to their susceptibility to contaminants. Especially horizontal surfaces are exposed to various loads. Their management should be cost-effective and involve simple handling techniques. Permanently clean surfaces should be the aim. Because first impressions count. For this PSS Interservice Group offers complete and state-of-the-art solutions. All with the 5-star PSS Surface Treatment Service:

- ★ On-site consultation
- ★ On-site test panels and technical support
- ★ Surface specific and customer centered solutions
- ★ Exert service delivery
- ★ Quality management and ongoing research and development

PSS Interservice Group protects or upgrades floor surfaces with a differentiated product programme – adapted to different substrates and customer requirements. The High End products are developed on the basis of nanotechnology, satisfying the highest demands of frictional loads in the building sector and possessing unique properties. For example, the *faceal oleo HD* impregnation for heavy duty applications. This possesses both oil and grease (oleophobic) and water (hydrophobic) repellent properties. This permits the creation of substrates which withstand the different contaminants and which are easy to clean. Water, oil and grease based contaminants or even those containing solvents can no longer penetrate into the pores



of the substrate or adhere to the capillaries. So impregnated floors not only retain their appearance and value but are easy to keep clean through daily upkeep.

PSS Field operators apply PSS products to sample surfaces and test surfaces to determine the optimal surface-specific solutions.

# Concrete in Black

PSS Interservice Switzerland is protecting all exposed surfaces on rail station buildings, subways and signal boxes of railway operator BLS in the greater Bern area. Both walls and floors are treated with PSS Technologies. Two examples serve to illustrate typical object-specific applications for the latter. The floors of the subways at BLS rail stations Bern-Lötschberg-Simplon are of concrete. Due to the high passenger frequency it was the aim of BLS to keep the floors permanently free from contaminants and chewing gum.



The product employed by PSS Interservice Switzerland is *faceal oleo HD*. The benefits: Since contaminants no longer adhere, their removal is significantly easier; therefore faster and hence more cost-effective.

## Object: Waiting accommodation with forecourt at BLS rail station Kehrsatz.

The 80 square metre floor of the Nord stop was finished completely in black to complement the modern steel and glass construction elements. So PSS specialists chose to use

### Concrete

A building material produced from a mixture of granulate (sand and gravel), water, additives, including mineral and various others such as dyes, latex, plus cement, which moistens and guarantees the hardening. Concrete is a porous material.



*faceal colour HD*. This pigmented heavy duty impregnation is ideal for colour accentuation, especially in modern buildings which use concrete as a building material.

# Mishaps no longer a problem!

**Object: Hall and foyer in Canton Bern city hall.** In this sandstone metropolis, the same material has also been used for the floors of this building. Many social events take place on this absorbent and hence highly susceptible



substrate in the hall and foyer. Bern Land and Buildings Office awarded PSS Interservice Switzerland the contract for treating the entire 582 square metres with heavy duty impregnation *faceal oleo* which is not visually perceptible. So the valuable limestone floors are now protected against penetration by water and oil based fluids, whatever mishaps might occur; spilt drinks, food etc. can now be simply removed with a damp cloth with no remaining stains and outlines.

# Enter - the small molecules



Oslo's new Opera House is in the course of construction. The natural stone floors surrounding the new building are being treated with heavy duty impregnation *faceal oleo HD*. Prior to the placing of the contract a Norwegian test



institute carried out extensive and thorough tests on different product systems. The building promoters and the architects selected *faceal oleo HD*. Both parties were impressed by the multifunctional properties of the small, nanoscale *faceal oleo HD* molecules. Through the Norwegian partner 'All Remove Norway', some 50 000 square metres of floor and wall surfaces are now being protected. In addition, graffiti endangered wall surfaces are being protected with the PSS sacrificial coating system *PSS 20* for ecological graffiti removal using only *PSS 20*.

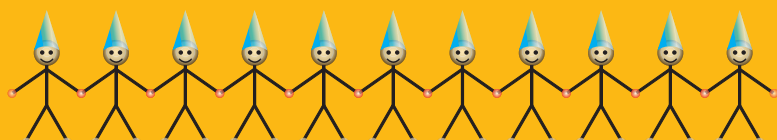


Multifunctional *faceal oleo HD* molecules have different lateral chains which perform various functions. Our *faceal oleo HD* team SAM illustrates this:

The 'little hats' consist of  $-CF_2$  chains (fluorinated groups with strong  $-CF_3$  ends). They guarantee the low surface tension.

The 'arms' are non-ionic groups. These guarantee the alignment and the interlinking of the team members.

The 'legs' are silane groups which bond permanently with the mineral substrate to ensure a durable and firm hold.



## Tasteful - true to the Döhler tradition



**Object: Döhler's parent establishment, Darmstadt.**

A bright, almost white limestone lends the foyer and works canteen of the parent house of aromatics producer Döhler an elegant room atmosphere with modern architecture. But however fine this high grade flooring may be, its absorbency renders upkeep and value retention



critical factors. And all the more so in functional areas such as the entrance and the canteen. After the laying of the natural stone flooring, PSS specialists decided on an ideal supplement by treatment with the heavy duty impregnation *faceal oleo HD*. This was two years ago and proved tasteful – true to the Döhler tradition. The molecules in the nanometre range render the surfaces oleophobic and hydrophobic. The result after two years' use: liquid contaminants do not penetrate and others (chewing gum, wear particles from footwear etc.) fail to properly adhere. The floors look as clean and free of stains and outlines as they did on the first day. The regular upkeep cleaning is carried out using microfibre equipment with some water and just a small amount of detergent. The work can be carried out efficiently, reducing costs and ensuring retained value of the natural stone floor:

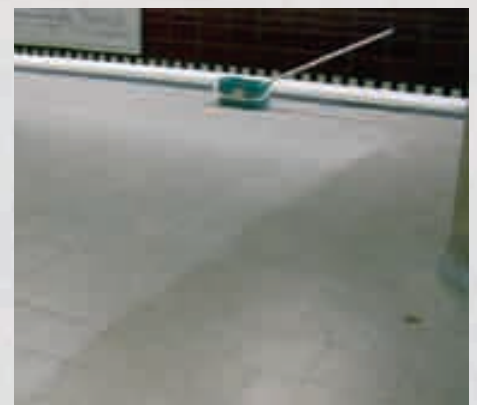
## Seventy thousand travelers per day

**Object: The Wandsbeker Markt rail station in Hamburg.**

Wandsbeker Markt rail station carries an enormous daily stream of foot traffic. Each day more than one seventy thousand people cross the granite flags which were laid in 2005.



Hamburg Hochbahn had already achieved positive results with PSS surface protection systems. So PSS Interservice Germany also treated the newly laid floors with the impregnation *faceal oleo HD*. HD stands of course for heavy duty, a material designation for an impregnation to withstand the highest loads. The surface protection system is still fully serviceable after two years. The



oleophobic and hydrophobic properties ensure that liquid contaminants do not penetrate the substrate. Cleaning is not only possible but is also more cost effective. Moreover, through the application of *faceal oleo HD*, there is no gloss, no other visual changes and vapour diffusion is not restricted.

**Limestone**

Limestone is classed as a sedimentary rock and comprises mainly:

- Calcite
- Aragonite

Most limestone was formed by the deposit of living matter. In addition there is chemically precipitated and clastic limestone. Limestone is very important for the building industry and as a natural ashlar:



# Baroque ecclesiastic buildings combined with High-Tech

The rebuilt Frauenkirche in Dresden is the emblem of protestant church building. The magnificent spatial effect is supported by a central arrangement of pulpit, baptismal font, altar and organ.

The church was reconstructed using both historic materials and modern techniques.



The building material in and around Dresden is sandstone. 13 000 cubic metres of this were used in the course of construction. The sandstone was obtained from the Postaer quarries in the Elbsandsteingebirge. All the floors in the church are laid with sandstone as are the areas around the altar. To retain the value of the sandstone floors, extensive testing was carried

## Sandstone

Sandstone is a sedimentary rock (also termed 'stratified') consisting of grains of sand cemented together which are predominantly of quartz. The size of the grains of sand is between 0.063 and 2mm.

- high strength
- easy to work
- obtainable in most regions
- visually attractive



out in the Frauenkirche in 2004 and 2005 with a wide variety of products. The selected product was *faceal oleo HD*. PSS Interservice Germany specialists used this to treat all the floors

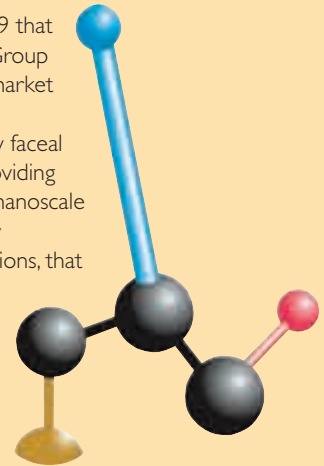


accessed by the public. In this way the sandstone floors received protection against contaminants which is visually imperceptible and based upon the most advanced key technology – the nanotechnology based application product for buildings: *faceal oleo HD*.



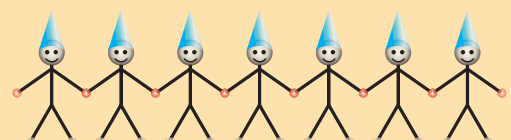
# Nanotechnology for buildings

It was back in 1999 that PSS Interservice Group launched on the market and successfully introduced its new *faceal* product family, providing architecture with nanoscale structures for new macroscopic functions, that is to say an almost perfect surface protection for buildings. The heavy duty (HD) version was the result of continuous further development of the product. This heavy duty impregnation also permitted the long term protection of floors.



*faceal oleo HD* uses the principle of surface tension. The surface is modified so that its tension is always lower than that of a possible liquid contaminant. This has the effect of repelling the liquid since it cannot wet the surface. The production of self-aligning molecular structures is an extremely complex and also very costly process. These properties are especially important with porous substrates because a substrate with a high surface tension actively absorbs liquids with a low surface tension – the finer the pores, the stronger the capillary effect. The heavy duty *faceal oleo HD* impregnation produces a surface tension which is under 10mN/m. The greater majority of all liquid contaminants exhibit values which are much higher:

Materials	Surface tension (mN/m)
<i>faceal oleo HD</i>	< 10
Water	72
Organic coatings	35 – 45
Waxes, paraffin	30
Silicone	25
Oils	20 – 25
Polytetrafluoroethylene (PTFE)	18
Fluorinated resins	10 – 15





## Free for culture!

### Object: House of Culture in Vincennes

In the town of Vincennes, a suburb of Paris, the entrance area of the House of Culture has been protected against contaminants and chewing gum.

The product employed is *faceal oleo HD* and a

total area of 840 square metres of the granite was successfully treated in 2004. To date, the paths for visitors to cultural events are free from firmly adhering chewing gum plus shadows and outlines from liquid contaminants.



## The joy of floors!

PSS specialists of PSS Interservice France treated the Mediterranean floors in the presence of a well known local politician. *faceal oleo HD* ensures that the ca. 300 square metres of surfaces are easy to clean and no liquids or other contaminants can penetrate the

extremely absorbent substrate. Kitchen, bar and dining room are now best equipped for events and festivities. So the joy of the floor endures.



## A text book style exercise

In Great Britain's Oxford University area the Said Business School is a towering structure, visible from afar.



After the successful treatment of the facades of the exposed building in 2002 with the PSS 20 graffiti protection system, the Said Business School has now had the floor surfaces in the outside area treated with *faceal oleo* as a multifunctional contaminant protection. In text book style, nanoscale molecules with oleophobic and hydrophobic properties now enable floors to be thoroughly and efficiently cleaned and achieve a durably clean appearance.

### Granite

Granites are igneous rocks:

- solid
- relatively large crystalline structure
- magmatic

Granites are rich in quartz and feldspars; they also contain dark minerals such as mica.



## Beach Park for relaxing



Five kilometres from Copenhagen is the wideranging Amager Beach Park. Thanks to its 4.6 kilometres of sandy beach it is a favorite

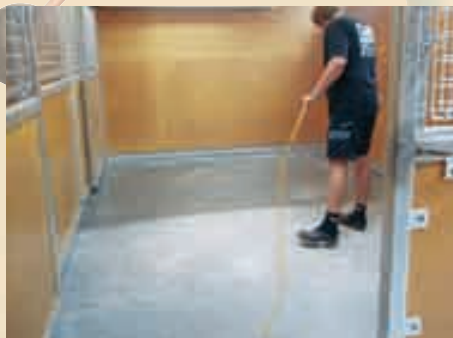


spot for relaxation. The extensive site has more than 18 000 square metres of paths and terraces consolidated with concrete. The Danish partner 'All Remove Denmark' has protected all the surfaces against liquid and general contaminants with *faecal oleo HD*.

So now, those responsible for the cleanliness of the Beach Park can also relax. The heavy duty impregnation ensures that no impurities can penetrate the substrate.

## A question of hygiene

An unusual application demonstrates the versatility of *faecal oleo HD*. These are the stalls in the Copenhagen Zoo. Here the floors have a great deal to put up with. Firstly from the animals and secondly from the high mechanical loads. *faecal oleo HD* has successfully dealt with



this challenge. By treating the concrete floors with heavy duty impregnation, these are now easy to keep clean – and without residues, stains, etc.





# Multifunctional surface treatment

the faceal family of products – multifunctional properties for many areas of application

**on absorbent, mineral floor coverings:**



*faceal oleo HD* – for substrates with fine pores and in the heavy duty version, specially suitable for floors



*faceal oleo HD/NC* – for substrates with an enhanced pH value



*faceal colour HD* – pigmented, multifunctional glaze for floors



*faceal colour Wetlook S* – impregnation with a 'wet' surface appearance, special gloss version for floors



*faceal colour Wetlook M* – impregnation with 'wet' surface appearance, special matt version for floors



*faceal step safe* – improves the nonslip capability of mineral substrates

**on absorbent, mineral walls:**



*faceal oleo* – for substrates with larger pore diameters



*faceal oleo NC* – for substrates with enhanced pH value, for example fresh concrete and larger pore diameters



*faceal wood* – for untreated timber



*faceal colour* – pigmented, multifunctional glaze for the cosmetic treatment of concrete and tinted concrete structures



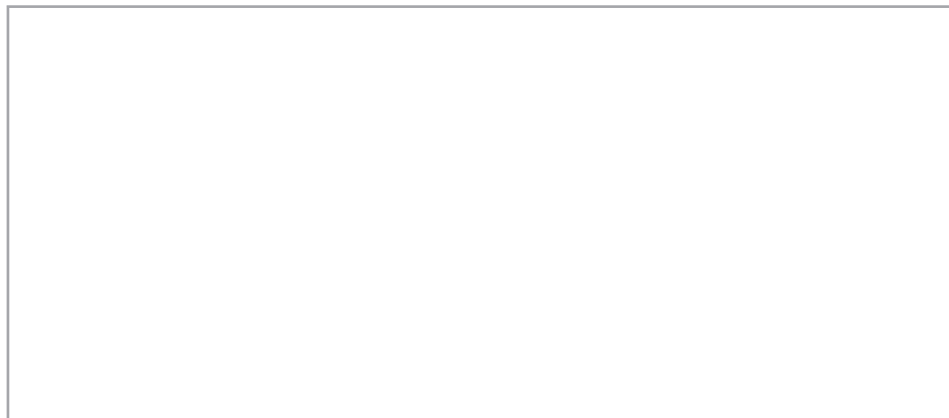
*faceal colour lumino* – fluorescent glaze



*faceal wood colour* – pigmented version of the faceal wood for untreated timber



*faceal algae safe* – destroys algae, moss and lichen; with long-term action



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