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BDG gets a makeover for stucco treatment

For almost 35 years, CTS has provided a distinctive line of products well-known to archaeological restoration professionals: the B.D.G. 86 line, specifically designed to address the issue of manganese stains frequently found on various types of archaeological artefacts.

These stains are highly disfiguring and virtually impossible to remove mechanically, as they penetrate deep into the material's porosity. Their origin lies in the natural oxidation of manganese, which, through the action of various microorganisms, transforms into manganese dioxide or a mixture of oxides and hydroxides with varying compositions, appearing as dark brown or black stains.

The product line was developed by GIOVANNA BANDINI, SILVIO DIANA, and GIOLJ GUIDI, who conducted in-depth studies in collaboration with the Archaeological Superintendence of Rome. Their research was based on diagnostic campaigns using XRD, SEM, and microanalysis. By the late 1980s, they had defined a series of products under the name B.D.G. 86, whose active ingredients are two reducing agents: hydrazine and hydroxylamine. The effectiveness of these products was tested on bones, ceramics, and stone.



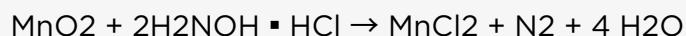
△ On the left you can see the cleaning effect with BDG 86



△ Test plug on putty with BDG 86

The two substances differ significantly in pH—hydroxylamine being acidic and hydrazine being alkaline. To ensure compatibility with different artefacts, the substances are mixed to achieve the appropriate pH for the specific material.

The chemical reaction between the reducing agents and manganese dioxide forms soluble manganese chloride, which can then be washed away:



For this reason, after treatment, it is crucial to rinse the artefacts with deionised water. For iridescent glass or degraded bones, rinsing with ethyl alcohol is recommended.

The critical considerations in selecting the optimal B.D.G. formulation are reagent concentration and pH. The pH ranges from neutral for stone and ceramics to slightly acidic for glass artefacts.



Over the years, B.D.G. 86 has successfully resolved countless cases of disfiguring manganese stains. Its application has even led to the re-identification of an important Etruscan artefact and has become a routine tool in many archaeological restoration laboratories.

Since 2016, B.D.G. formulations have been tested for removing black stains from the stucco decoration of one of the sub-arches in the Vestibule of the subterranean Basilica of Porta Maggiore in Rome. By adjusting the parameters of the formulation, the original colouring was spectacularly restored, as shown in the accompanying image.