Natural Oxidisation of Leaded Windows

New leaded windows - What to expect

Like any natural lead product exposed to the environment, lead profile will undergo certain 'atmospheric' transformation. This is perfectly natural and it will eventually settle down to take on the traditional 'weathered lead' appearance that is so admired in old churches and the leaded windows of stately houses. During this process however, especially in the early stages, some people may become concerned at the changes they see occurring.

Why do changes occur?

All lead profiles are made from refined, almost pure lead and, although this has been alloyed to improve performance, when it is exposed to the atmosphere for the first time it becomes subject to a process called oxidisation.

Chemists define the process of oxidisation on lead as:

"a chemical reaction instigated by the exposure of lead to the atmosphere in which insoluble lead compounds such as lead sulphate (PbSO), lead sulphide (PbS) or lead oxides are formed on the surface. These major reaction products naturally form a compact, non-porous adherent film on the lead's surface which stilifies further reaction between the metal and the atmosphere."

Put in more simple terms it means that when lead profile first comes into contact with the atmosphere, the surface gradually oxidises to form a natural protective film called a patina, and it is this which eventually produces the familiar grey colour.

The time required to complete this cycle will vary depending on the purity of the lead, the location, time of year, environment, weather conditions and airborne impurities.

What changes are seen

During the initial stages of patination the lead can appear to take on various colours such as blue, bronze, gold and green. This effect is purely optical and is usually due to the angle of light. The effect is similar to the colours seen when oil is spilled onto a wet road surface. Gradually, however, these colours will fade away to eventually leave the final protective grey patina.

There is another side-effect of oxidisation which can occasionally give rise to concern. When lead first comes into contact with moisture (rainwater or condensation) it may result in temporary discolouration, spotting and even the appearance of white powdery deposits (basic lead carbonate) which in wet weather can run onto the glass. Again this is perfectly natural and the temporary blemishes will eventually disappear as the patination process continues.

The powder can safely be wiped off from time to time until the natural patination process is fully developed.

The Process of Patination

The chemical process leading to the formation of the protective patina film is as follows:
LEAD ☞ lead oxide ☞ basic lead carbonate ☞ normal lead carbonate ☞ normal lead sulphite ☞ normal lead sulphate ☞ PATINATION

It is important that this is applied as soon as the window with lead profile is installed, as once the natural patination process has started it is too late and possible spotting and powdery deposits will appear.

Treatment

There is no need to treat the lead profile as the patination process will occur naturally.

The process can be controlled however, by applying Patination Oil which will encourage the formation of the grey patination finish.

White Spirit is also a good cleaner for leaded windows, apply liberally with a cotton cloth making sure not to scratch the soft lead.

A soft paintbrush with a mild soap cleaner applied with a spray bottle is also a great way to clean a leaded window.

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