

# What is the Natural Oxidation of Lead?

Technical  
Guide

Oxidation is a natural process that changes the appearance of lead overtime when the lead is exposed to environmental conditions and weather cycles such as rain, snow, and condensation.

When exposed to the elements, the appearance of new lead windows will enter the initial stages of patination and can appear to take on assorted colours, such

as blue, bronze, gold and green. In the initial stages of installation, householders may become concerned by the changes they see; however, this is usually due to the angle of the light. Gradually, these colours will fade away to leave the protective grey patina- the traditional weathered lead appearance admired on old churches and the leaded windows of stately houses.

## What causes lead to oxidise?

Oxidation is: "A chemical reaction instigated by the exposure of lead to the atmosphere in which soluble lead compounds such as lead sulphate (PbSO), lead sulphide (PbS) or lead oxides form on the surface.

Clayton Glass uses a refined, almost pure lead that is alloyed to improve performance. As a purely natural material, the lead becomes subject to the oxidation process when exposed to the atmosphere. Patination of lead signals the start of the chemical reaction associated with oxidation.

## Removing oxidation from lead

Another effect of oxidation that can cause concern is temporary discolouration, spotting, and white powdery deposits (basic lead carbonate), which can run onto the glass in wet weather conditions. Lead carbonate forms when lead first encounters moisture and is perfectly natural. The powder can be safely wiped off with warm soapy water, as you do your usual window cleaning until the process has fully developed.

However, removing the patina is not recommended as it exposes the layers underneath and restarts the whole process. We would advise that lead is be allowed to become accustomed to the environment in its own time. Once the exposed lead is sealed, it stabilises into a familiar dark grey colour.

## How long does lead take to oxidise?

The time it takes for the oxidation process to complete its cycle will vary depending on the purity of the lead, the time of year, the environment, weather conditions, and airborne impurities.

The patination process occurs naturally, and there is no need to treat lead. However, Clayton Glass can apply lead patination oil at the factory or immediately after installation. Using lead patination oil can pre-control the patination process and encourage the formulation of the grey finish.