Tel: -01608 683022
Email: - info@oxfordplanters.co.uk; **Website**: - www.oxfordplanters.co.uk

The process in Lead weathering

Lead forms a series of oxides,. The principal ones are PbO, a yellow oxide called litharge, and PbO2, a reddish-brown substance called lead dioxide, Orange-yellow Pb2O3, while red Pb3O4, red lead or minium. In addition to these, there is Pb2O, lead suboxide, a black, amorphous substance Basic lead carbonate, 2PbCO3•Pb(OH)2, when pure, is a brilliant white substance that makes an excellent paint pigment, called white lead.
Perhaps lead's best known property is its resistance to corrosion in various aggressive environments Lead's ability to give good service in such situations often gives the erroneous impression that lead is a passive metal. Lead is, in fact, a very reactive metal and it is this reactivity which enables it to be used in corrosive environments. In air, for example, a close fitting and adherent film of lead carbonate is formed by rapid reaction first between metallic lead and oxygen to form lead oxide followed by a second reaction between the lead oxide film and carbon dioxide, which is always present in air, to form a protective film of lead carbonate. Further contact with the metallic lead underneath is then prevented and corrosion ceases.
Lead patina is a layer of highly insoluble lead salts, including lead carbonate, which gradually form on the lead surface to eventually give the familiar grey lead appearance.
During the initial stages of the oxidation process, lead can display various colours including blue, bronze and green. It is probable that such films are extremely thin and in fact have no intrinsic colour but appear coloured due to an interference effect Similar interference colours may be observed when oil is present on a wet road. Lead is most likely to appear coloured when placed indoors or in protected locations.

When lead meets moisture, rainwater, condensation etc, at early stages, discoloration, spotting and white powdery deposits (usually basic lead carbonate) can form and may ‘run-off’. The degree to which all these occur is governed by the environmental conditions, but with longer term weathering, the lead will take on its’ familiar appearance.
Investigations have shown that the patina formation follows the route: lead, lead oxide, basic lead carbonate, normal lead sulphite, and normal lead sulphate. The ‘run-off’ stage occurs when non-adherent basic lead carbonate is formed, usually through contact with moisture. Each of the stages in patina formation is adherent, highly insoluble lead salts and in practice, as these salts develop with weathering, they stifle the basic lead carbonate release. The final patina is made up of approximately 30% normal lead sulphite, 60% normal lead sulphate and 10% normal lead carbonate. However, this can vary dependent upon location, time and airborne impurities.