

Guidance Note on painting cast iron waymarkers

1. Introduction

Many milestones and waymarkers beside the roads of Britain have metal plates or are free-standing metal mileposts. The majority of these are cast iron and will rust, making the legend unclear and eroding the surface detail. Mileposts that are restored using routine external painting techniques often begin to rust quickly in the aggressive environment beside a road. This guidance note on the best available techniques for re-painting metal waymarkers draws on the experience of Milestone Society members and other professionals specialising in the restoration of mileposts, fingerposts and other metal wayside features. The methods recommended here will conform with principle of doing no irreversible harm to the item but will hopefully extend the period before re-coating is required.

2. Overall Principles

- Cast iron will rust when exposed to a moist atmosphere and this corrosion will progress below the surface coating, eventually bringing off the paint and some of the metal surface
- Where possible any stable paint layer which is well attached to the metal should be preserved and overpainted
- The "bloom" on the surface of fresh cast iron resists rusting and should be protected where possible by avoiding aggressive, mechanical erosion of the metal surface.
- All loose rust, dirt and moist residues must be removed before recoating
- Despite claims by paint manufacturers, an anti-rust coat or primer is essential on roadside metalwork
- The thickness and integrity of the paint layers is the most important barrier to corrosion
- Sharp edges, surface roughness and spikes in the metal surface, where surface tension will make paint cover thin, need particular attention
- Painting undertaken in dry, warm conditions will survive longer than work done in damp conditions.
- The guidance is concerned with cast iron, which was the principal material used to construct roadside furniture well into the 20th century. Modern, light alloys may require other specialist methods.

The work conforms to the principles of conservation and safe working detailed in *Milestone Society Guidance on Conservation of Milestones and other Waymark features* and with Policy Note 1: *Position and Conservation of Milestones* and Policy Note 2: *Appropriate Levels of Conservation for Milestones*.

3. Preparation of Surface

Preparing a stable surface for the paint is vital for longevity of the final coating. However, stripping all the older coating back to the bare metal is neither necessary nor desirable. Where the attachment of paint to the metal is strong and unbroken, it is better to use this as the foundation. For aesthetic reasons it may be desirable to remove rough coatings or the build up

Painting Metal Waymarkers - Milestone Society Guidance

of thick, multiple layers that hide detail. Abrading these surface to remove traps for dirt and water may be necessary, but this can be done without breaching the old paint cover.

In order to form a stable surface it will be necessary to remove some rust, old paint and dirt from most cast iron items. Whenever stripping paint from old mileposts, be aware that the old coatings may include toxic lead primer and so adequate personal protection is essential during this work. Particular care is needed to clear loose material around edges and in deep crevices, but this can be difficult where a bolt, or bolt hole passes through to an inaccessible back surface. If it is possible to disassemble an item, then thorough de-rusting may more easily be achieved. If the post is to be painted in-situ, clear away soil from the base so that the area a little below the normal soil level can be painted.

Undamaged castings may retain the surface "bloom" that provides a protective layer and some bare surfaces have a rust free dark grey/brown surface patina which should be preserved. Where mechanical cleaning has not been used previously, chemical stripping of the attached paint can retain the integrity of this original cover. Solvent based, chemical paint-stripper such as Nitromors removes the types of paint that have traditionally been used on mileposts. The blistered paint can be removed with non-metallic or soft metal implements. However, it can take many treatments to lift the thick layers and this will disturb adjoining areas where paint was well attached to the surface. Hence, the use of chemical strippers may be limited to discrete areas of old paint.

Mechanical methods are most commonly used to clear the surface but this is a slow and laborious task. Using soft metal implements will preserve the metal surface (and associated bloom) and if old paint can be removed with flattened copper piping or brass wire brushes this is preferred. However, any surface finish may have already eroded and harder tools are more convenient to chisel, scrape and abrade the old surface cover. Nevertheless these should be employed with only sufficient force to remove the loose rust and paint, without deforming the bright metal below. A sharpened screwdriver, small chisel or punch is suitable to clear the residues from around the raised letters and remove areas of old paint and rust from the face. A light hammer may be useful to detach old paint from large areas, though care is needed not to bruise the underlying metal. A stiff wire brush will remove remaining loose material. Mild abrasives such as Emery paper and wire wool are convenient for smoothing the final surface where necessary but in most cases wire brushing is an adequate finish. A cordless hobby tool fitted with a rotary wire brush is useful for cleaning around raised lettering.

Sandblasting or shot blasting will remove old paint and loose rust from the surface but these methods can generally only be used in a workshop so the post will need to be lifted and moved. Furthermore these methods are potentially erosive and if the treatment is too aggressive the sharpness of the casting, particularly the letters may be lost. Shotblasting removes the old layers of surface patina and it has been found that shot blasted items have rusted very quickly if routine painting methods are used subsequently. Hence, additional care is needed working indoors with low humidity and applying a blast base primer within 15 to 30 minutes and the first primer within a couple of hours. Alternatively, after shotblasting, the item is left to age in dry conditions (perhaps for several weeks) so that a new layer of stable, non-hydrated oxide forms.

Painting Metal Waymarkers - Milestone Society Guidance

A pin/needle gun of compressed air alone has been used to clean cast mileplates. Here there is no damage to the metal, the letter edges remain sharp and there is no problem with erosion of surface patina.

4. Primers and undercoats

The metal surface will have small cracks and microscopic pits which will retain moisture and rust. It is crucial that this surface is dry before beginning to build up new layers. In extreme cases gentle warming with a blow torch can help dry out particularly deep cavities/pitting but excessive heat must be avoided. Ideally the item should be left to dry naturally so it is better to strip and paint in the drier summer months; painting during the winter is to be avoided.

It is strongly recommended that the surface is treated with a rust inhibitor, even where it appears clean (note that rust removal formulations may not be rust inhibitors). Several proprietary formulations have been used on mileposts, including;

- Phosphoric acid based products supplied by DIY chains
- Kurust or Jenoseel, liquid and gel.
- Owatrol rust inhibitor
- Fertan; a tannic acid formulation which is safer than phosphoric acid and pacifies residual rust but has to be left for up to 2 days

Irrespective of whether a rust inhibitor is used, a good primer layer is required (despite claims by Hammerite a pre-coat has been found to be essential in the roadside environments). general products include;

- Metal primers (for iron and steel) from the leading specialist paint suppliers (from DIY chains);
- zinc phosphate primer
- red lead oxide base (though there are restrictions on using this lead based product) - this is not the same as common red oxide primer).

The primer may act as an undercoat as well but English Heritage recommend one coat of zinc rich primer, followed by one coat of micaceous iron oxide paint. Others have found 2 coats of a zinc primer give a satisfactory result. Where the top coat requires an undercoat, at least two undercoats are needed to build up the thickness of the barrier above the primer.

For most situations, a rust inhibitor coat followed by a metal primer coat will give sufficient cover to provide the foundation for the Hammerite topcoats.

5. Topcoats

A single topcoat is unlikely to build up sufficient thickness to protect the metal, particularly at the edges. The choice of topcoat may be influenced by the location of the post. If the post has been removed to a protected work area then a good system or two-part epoxy paint can be considered to give a durable coating. When a milepost is very close to the road and exposed to high levels of dust, a slow drying paint may give a very poor finished surface and in such extreme circumstances a fast drying paint such as Templas QD90 might be considered.

Painting Metal Waymarkers - Milestone Society Guidance

In most circumstances specialist metal paint such as Hammerite (available from most DIY stores) is normally regarded as suitable on top of the primed surface. Best practice is to apply three coats of Hammerite in succession over a single day, leaving each coat to just dry (normally 4 hours) before applying the next. If paint has to be left it will begin to cure and so must then be left several days before the next coat is applied. Hammerite is very viscous when cold and so is difficult to work and achieve a smooth finish on cold days. Multiple layers of Tractor enamel paint may be considered, particularly where the final finish of the item is important (e.g. exhibition). In many routine circumstances even domestic paints such as Dulux or Farrow & Ball metal paint can be used - provided a sufficient number of coats are applied to build up the protective layer.

It is normally convenient to paint the whole structure in one colour, usually white. Note that modern brilliant white may be regarded as rather garish and so off-white shades might be preferred for prestige examples. Once the necessary background cover is achieved, the details can be painted in another colour, usually black.

For the details it is best to use a paint with a workable viscosity, with sufficient coating power to hide the white below (most good quality paints from DIY stores will achieve this). A fairly fast drying enamel such as black Valspar (hard to find) or black Japlac have been used successfully when applied by brush as soon as the white is sufficiently dry or up to 24 hours later. This has good adherence although it tends to lose its gloss after a couple of years. A brush is needed for details and low-tack masking tape can be put on the Hammerite base after four hours but is better left for 24 hours. If the raised lettering is consistent, it is possible to apply the black paint with a small, hard-foam paint roller. First, line the paint tray with cling film or foil and spoon sufficient paint into the tray. Apply boldly with the stiff roller and try to cover the raised letters in a single application. The wetted surface can be touched up using a small brush to apply additional black paint. Once complete, remove the roller refill and wrap it in the film for disposal. In general it is not worth cleaning brushes at the end of a campaign (keep them workable for short periods in a jar of water), so use cheap disposable items.

6. Secondary issues

The immediate surroundings of the waymarker should be improved before leaving the site. All materials used in the restoration must be cleared, along with general roadside rubbish. Sight-lines to the marker should be cleared of woody plants that will obscure the post in the long term. The area around the post can be designed to minimise the risk from grass cutters or rain splashes. A gravel surround may achieve both these objectives.

After all this, the advice from a conservation expert is that these posts may need some remedial treatment after 5 years exposure on the roadside.

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incorporating comments and practical details from John V Nicholls and Jeremy Howatt