Care of Cutlery and Flatware

A guide to help you care for your cutlery

CATRA | **Cutlery and Allied Trades Research Association**

Care of Stainless-Steel Cutlery

Stains

Staining in stainless steels is, unsurprisingly, a rare phenomenon. However, staining will occur under particular circumstances – it is **stain-*less*** steel, not stain-proof.

In most cases, it is caused by something firmly deposited on the steel rather than any attack to the steel itself. The most common cause of staining is an attack by a dip solution used for removing tarnish from silver. Although excellent for cleaning silver and E.P.N.S. (see below), these solutions should be kept clear from stainless steel; they contain acids that etch the steel, first giving it an iridescent, rainbow-coloured stain and ultimately etching it a dull grey. Even if dipping only the silver handle of a knife, it is very easy for drips fall onto the stainless-steel blade or the blades of other cutlery that may be lying around.

All tap water contains dissolved mineral salts that leave a thin film on any piece of cutlery. A resultant stain can usually be wiped off, but more vigorous treatment may be needed, such as using a stainless-steel cleaner*.

Detergents, especially unnecessarily strong solutions of detergent, can leave an indelible rainbow-colour on stainless steel if they are not rinsed off and are allowed to dry out. This is a common problem with some dishwashing machines when the rinse cycle is malfunctioning.

Very hard water can deposit a chalky film on stainless steel, but this is only likely to occur in dishwashers that use un-softened or incompletely softened water.

Hot grease, fat or meat juices sometimes leave stubborn rainbow-coloured stains on stainless steel, but this is more likely to occur on meat dishes than cutlery – again, this does not mean there is anything wrong this the stainless steel and the articles will be as good as new after the stain has been removed.

Heat by itself will impart a heat-tint (also rainbow-coloured) to stainless steel, which is likely to occur if the cutlery is accidentally left on a hot plate or gas burner.

Prolonged immersion in household vinegar can stain stainless steel knives if left on for several hours, but more rapidly if the vinegar also contains salt.

Rust-coloured stains may occur. Wet fragments of steel that find their way onto cutlery may go rusty, staining the stainless steel. Other ‘rust’ stains may come from corrosion pits in the cutlery, although the pits themselves may be so small that they are barely visible.

NB: there may be other causes of staining that have not yet been identified.

* Most stains that resist ordinary rubbing with a soapy cloth can be removed with stainless steel cleaners.

CATRA | Henry Street, Sheffield, S3 7EQ, United Kingdom.
Tel: +44 (0)114 276 9736 | Web: www.catra.org | Email: sales@catra.org
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Pits

When stainless steel corrodes, it does not rust all over like non-stainless steels but acquires small, localised pits on its surface.

Most spoons and forks are made from stainless steels that have excellent corrosion resistance; they are virtually immune to pitting. For knives, however, the blade steel is selected to give a compromise between corrosion resistance and cutting properties. The corrosion resistance of this steel is strongly influenced by care in manufacture through hardening and avoidance of overheating when grinding. However, only marginal improvements are achieved by the selection of alternative, and more expensive, steels. Research is continually being carried out in the search for significantly better steels and method of treatment.

Prolonged contact with water is probably responsible for more pitting than anything else. Knives that are left undried or immersed in water overnight can receive as much exposure to the corrosive effect of water as three or four months of ordinary use where they are in contact with water for only a few minutes each time they are washed. This is caused by the traces of mineral salts in tap water. It is for this reason that blades in one establishment last for years without trouble, whilst pitting becomes apparent within a few months in others.

Common salt and liquid bleaches are very corrosive and will greatly accelerate the corrosive action of water. Some water softeners are regenerated with salt. If they are not functioning correctly, the softened water can have a high salt content. After adding salt to water softeners in a dishwasher, make certain that it is put through the rinse programme recommended by the supplier before washing knives in the machine. Detergents, on the other hand, are normally harmless when fully dissolved and often inhibit corrosion by water. If, however, certain powder detergents come into contact with blades in hot water before the detergent is fully dissolved, pits can form within a few minutes. Un-dissolved table salt can have a similar effect.

If pitting does occur, a diligent enquiry into the washing procedure is recommended to find out whether the cutlery is ever left in contact with water for a long time. Managers of catering establishments are not always aware of what really happens in their kitchens – for example, only the person directly involved will know whether dirty cutlery is left to soak in a bucket of water until someone has time to wash it, or that the last batch of knives to be washed in the early hours is left unwiped to dry overnight in a humid basement.

Silver Plated Cutlery, Flatware and Hollowware

Most silver-plated cutlery and hollowware are marked E.P.N.S. – Electro-Plated Nickel-Silver. ‘Nickel-Silver’ refers to a copper-zinc-nickel alloy; it contains no silver but, because nickel imparts a colour resembling silver, it is known as nickel-silver. In many countries (e.g., USA), nickel-silver is not used, but brass instead.

Stainless steel cutlery or hollowware is sometimes silver-plated, in which case it may be marked ‘E.P.S.S.’. Knife blades with a cutting edge made from stainless are not plated with silver because it would blunt their edges. The life of silver-plate depends upon its thickness and how often it is used. A household that saves its silver-plated cutlery for special occasions may use it on average only once a month – elsewhere it may be used several times a day.

When selecting cutlery, it is advisable to compare the thickness of silver claimed to be present on every piece. Silver thickness is normally quoted in microns*. As a very approximate guide, work on at least 1 micron of silver thickness for every year of intended use.

** 1 micron is one thousandth of a millimetre.*

Care of Silver

The characteristic white patina of silver, which is responsible for much of its aesthetic appeal, becomes more pronounced with age due to the optical effect of many very fine scratches that develop in use. On new highly polished silver, however, the few fine isolated scratches that first appear tend to be conspicuous until the white patina has fully developed.

Silver is highly resistant to corrosion, but it can be tarnished by sulphides that are present in the atmosphere and in many foods, with green vegetables and eggs being the most potent. Tarnish consists of a superficial film of silver sulphides. It is initially a light gold colour, but, if exposure to sulphides is prolonged, blue-black discolouration can occur.

Sulphides in the atmosphere originate mainly from of oil, coke, and wood combustion and from living creatures. To avoid the need for frequent cleaning, it is best to store silver cutlery in a box or drawer in a room without a fire of any type. To avoid tarnishing by food, rinse the cutlery as soon as convenient. Tarnish-resisting papers and cloths are available to store silver, which will reduce the rate of tarnishing.

Tarnish Removal

Silver will tarnish with age, not matter how well-cared for. Four methods of removing tarnish of silver are available: polishing powders or pastes, chemical dip solutions, electrolytic methods and ball burnishing.

1. Polishing Powders and Pastes

Only those sold specifically for silver should be used; cleaners intended for chromium plate, stainless steel and alike will scratch silver. Always apply the cleaner with a soft cloth or sponge – either of which should be thoroughly and freshly washed to eliminate any abrasive dust particles that could cause scratching.

Some cleaners that are available in paste or emulsion form not only remove tarnish but contain tarnish inhibitors. Such products are particularly useful for hollowware (being handled, washed and wiped less frequently than cutlery, the inhibiting effect lasts longer).

Overzealous pressure when cleaning with powders may remove significant amounts of silver, which will ultimately wear through the plate completely.

2. Chemical Dip Solutions (often referred to as Silver Dip)

Provides a rapid, less arduous method of tarnish removal, especially on heavily embossed designs with crevices that are difficult to clean with silver powders. These dip solutions convert the film of tarnish (silver sulphides) back to silver by removing the sulphides without removing any silver. However, the following precautions must be taken:

- Never leave silver plated cutlery in the dip solution for more than 10 seconds.
- Do not use dip solutions to remove very heavy tarnish. They will convert the silver sulphides to silver but, because heavy tarnish is thicker, the surface of the restored silver may have a matt finish.
- Dip solutions can stain or even etch stainless steel knife blades. Any drops that fall onto blades or other stainless-steel equipment should be rinsed off immediately.

3. Electrolytic Methods

Tarnish can be removed from silver by immersing it in a hot solution of washing soda of about 6 g/l with the cutlery or hollowware is in contact with aluminium.

Proprietary kits are available, but the process can be carried out on a DIY basis in a plastic bowl with a sheet of aluminium foil laid in the bottom so that the cutlery is in contact with the foil. When the foil eventually darkens and becomes brittle, it becomes ineffective and needs replacing.

As in the case of chemical dip solutions, the process is not suitable for use on very heavily tarnished silver upon which it can produce a dull white finish.

4. Ball Burnishing

This is a bulk process for use in large catering establishments. The cutlery is placed in a rotating drum containing steel ball bearings, water, and a corrosion inhibitor to prevent the steel balls from rusting. Its prime purpose is to brighten and harden the surface so that it becomes more resistant to scratching and wear. In addition, it will remove light to moderate tarnish, except in the crevices of heavily patterned pieces.

Despite the apparent severity of the process, it does not wear off the silver if carried out under intelligent supervision and in accordance with the machine supplier's instructions.

Problems likely to occur are:

- Entanglement of fork prongs, which may cause some to bend. This can be avoided by positioning the compartment separators closer together so that the forks stay orientated across the barrel.
- A matt scratched finish, caused by having insufficient water in the burnisher. This can occur because of leakage if the machine's lid has not been adequately tightened or if its seal is defective.
- Developments of grooves on the sides of vessels, such as tea pots. This is caused by the compartment separators being too close together, thus allowing steel balls to become entrapped between the separators and the sides of the vessel. Compartment widths should be adjusted to suit the width of vessel being burnished.
- Hollowware can be damaged if large, heavy items are burnished in the same compartment.

Washing Cutlery in Dishwashers

Dishwashing machines provide a welcome relief from the task of washing up. However, to maintain knives in a good condition, some precautions are necessary. Special stainless steels are generally used for knives to give them a lasting edge, but these steels can become pitted or corroded if left repeatedly and for too long in contact with moisture.

- Whenever possible, wash knives immediately; do not leave them wet overnight and do not subject knives to the 'rinse and hold' cycle. In these cases, the dishwasher acts as a dirty storage cabinet and causes knife corrosion.

- As soon as the dishwasher has completed its cycle, remove the knives and wipe them dry. It is particularly undesirable to leave them overnight in the damp atmosphere of a dishwasher.
- Observe the dishwasher manufacturer's instructions concerning the type and quality of detergent used and the method of loading cutlery in the compartments provided.
- Water with a high salt content is particularly corrosive to stainless steel. Dishwashers are often fitted with water softeners that must be regenerated with salt. After adding salt, make certain that the machine is put through the programme recommended by the supplier before washing knives in the machine.
- Cutlery with handles of wood, plastic, bone, or China should be washed by hand unless it is stated to be suitable for dishwashers.
- If any stains are produced by hard water, detergent, or by any other cause, they can usually be removed by rubbing them with a non-abrasive metal cleaning paste or liquid. Detergent stains can often occur with regular dishwasher use and show themselves as rainbow-coloured stains. These can easily be removed with lemon juice.
- Do not allow undiluted dishwasher detergent to come into contact with silver or silver-plated items as this may result in permanent staining of the surface. Some dishwasher manufacturers are not aware of this and position the cutlery basket immediately below the detergent dispenser.
- Do not place silver-plated or silver cutlery in at the same time as stainless-steel items because it can increase the risk of the stainless-steel corroding. Do not place knives with silver/silver-plated handles in the dishwasher at all.

Printed copies of this document are available to cutlery manufacturers, distributors and retailers for inclusion with cutlery and flatware at the point of sale.

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