

Number: 2008/02

JAPANESE BLACK – YOU’LL OFTEN PAY FOR IT IN THE END

The use of coal tar as a preservative can lead to extensive damage

It is incomprehensible that Japanese Black is still being used as a preservative on steel pipe sections, and particularly on fittings. This preservative, which is very difficult to remove, has many names: Japanese Black, Japanese Varnish, Coal tar, Brunswick Black, Black Coating etc. Its precise composition varies greatly, but is always based on bitumen, a final distillate of crude oil. As mentioned above, Japanese Black is used as a preservative on steel welding flanges, T-pieces, welding sockets, reducers and various types of welding bends. This agent is an excellent, inexpensive preservative, but it is inert and its use extremely hazardous in technology. The presence of Japanese Black in new construction projects in both industry and ship-building has already caused a large number of financial setbacks, sometimes exceeding a million euros.

Removing Japanese Black

Prior to the assembly of steel pipe systems for steam, lubricating oil, fuel, hydraulics and process-critical applications, etc., Japanese Black has to be removed from the inside of the fittings, that is, before these fittings are welded into the system in question.

The only cheap way to remove the preservative at this stage is sandblasting or mechanical grinding. If it is not removed, big problems will arise after the pipe sections have been assembled and installed.



Removal of Japanese Black by mechanical grinding



Pre-commissioning cleaning and Japanese black

In order to prepare the above-mentioned systems and installations for the use in the process for which they are intended, preservative, rust and milling scale must be removed from the internal metal surfaces.

A chemical surface treatment must be carried out to achieve a clean surface. This treatment normally takes place in a metal laundry. The pipe sections are prefabricated delivered by the client and are subsequently returned, ready for assembly, clean with protective caps and/or with an external coating. If delivery to a metal laundry is not (or no longer) possible, Vecom Industrial Services B.V. can carry out this work on site, using chemicals and auxiliary circulatory materials.

Japanese Black must, however, always be removed in advance. It is not removed by a standard pickling procedure.

Not removing Japanese Black, for example from pipes to be used in a steam installation, will result in the following problems. Once the line goes into operation, the preservative will disappear due to the high temperature of the steam. Particles of the underlying milling scale will subsequently become detached and, together with the steam, may cause extensive damage to the steam turbine. Similar consequential damage to motors, gearboxes, regulating valves and hydraulic cylinders can also be expected in lubricating oil and hydraulic systems.

If Japanese Black is already in the installation

Methods for removing Japanese Black from systems that have already been assembled and sealed are very limited:

- 1) Dismantle the pipe sections again and then have the preservative sandblasted out, after which a chemical surface treatment must be implemented at a metal laundry. The cleaned pipe sections are then returned, with protective caps, ready for assembly. One can then be absolutely certain that the pipe sections are 100% clean.
- 2) A company such as Vecom can try to remove the Japanese Black on the spot by using alkaline chemicals specially developed for this type of contamination. A high temperature must, however, be maintained in the system throughout the cleaning. A purity of approximately 90% can be achieved using this method, depending on the precise composition of the preservative. In these situations, Vecom determines the agents and temperature that will yield the optimal result by cleaning on a laboratory scale in advance. After the removal of the preservative, a chemical pickling procedure will be carried out to clean the internal surface of the pipe sections.

Where appropriate, Vecom can also supply expertise, supervision and chemicals, with which the customer can carry out the activities with its own equipment and labour. The waste flows that arise must be delivered to a recognised processor, such as Vecom, for processing.

Advice for designers, structural engineers, pipe fitters, assembly managers, plant managers and anyone else who comes into contact with this preservative:

Japanese Black: prevention is better than cure.

Author: Willem Baris (director Vecom Metal Treatment (Midden) BV)
Reactions and/or questions: e-mail: tb@vecom.nl
www.vecom-group.com



On-site cleaning



Example of Japanese Black