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BOILER CLEANING AND LUBRICATING COMPOSITION, AND METHOD OF USE IN HOT WATER SYSTEM

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2 Claims

ABSTRACT OF THE DISCLOSURE

A boiler cleaning and lubricating composition, and method of use in hot water system comprised of 13.5% polypropylene glycol (average molecular weight 2000), 4.8% tergitol nonionic XD (polyalkylene glycol ether), 3.5% acrylic emulsion copolymer (acrysol), 76% water, 1.5% silicone oil and .7 triethanolamine.

The aforesaid composition has been found to be a remarkable cleaner and rust inhibitor for use in hot water heating systems because it provides a protective film upon various parts of the system. However, the film is heat conductive and does not provide resistance to heat transfer, and this increases the heating characteristics of the system. The composition of the present invention also provides lubricating properties by the presence of polypropylene glycol and silicone oil.

This invention relates to a boiler cleaning and lubricating composition, and method of use in hot water system and has as its objective the provision of a novel and highly successful composition of this general class.

The use of film forming compositions in hot water systems is generally known in order to provide a protective film that is resistant to rust and corrosion. While these films are generally satisfactory from the protection standpoint, they are usually heat insulating in nature, such that heat transfer from the hot water system is retarded. In hot water systems unwanted deposits build up and thus with the passage of time the heating value of such systems decrease.

Previously, the presence of unwanted deposits in hot water systems did not cause any great alarm. However, with the development and use of zone valves and circulators, relatively minor amounts of unwanted deposits have a most unsatisfactory fouling effect.

The present invention introduces a composition wherein the presence of a lubricating silicone oil in a properly balanced formula provides a film which is heat conductive and does not provide resistance to heat transfer.

In addition to the foregoing properties, the present composition is non-clogging and is also an effective lubricant with the further property of dissolving sludge from fixed or moving parts and accessories thereby minimizing fouling.

In particular, an important objective of the present invention is the provision of a cleaning composition which will provide a heat conductive or non-heat insulating film.

Yet another object of the present invention relates to the provision of a cleaning composition which will remove sludge and lubricate zone hot water valves, thereby keeping them from fouling.

A further object of the present invention is to provide a cleaning composition which will also lubricate pump seals and other moving parts.

Yet a further object of the present invention is to provide a cleaning composition which will prevent and remove insulating sludge on submerged coils.

Still another object of the present invention is to provide a cleaning composition which will prevent the clogging of automatic hot water valves, and at the same time

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will remove impurities so that the water becomes clear.

Yet another object of the present invention is to provide a method of using a cleaning composition in accordance with the hereinabove stated objectives of the invention.

The foregoing as well as other objects of the invention are achieved by providing a cleaning composition and method of use in accordance with the present invention. The following discussion and specific examples are given in order to provide a complete disclosure of the invention but are not intended to be exhaustive of the many variations of the invention that fall within the concept of the disclosure.

The objectives of the invention are achieved by providing a cleaning composition comprised of the following:

	Percent by weight
Polypropylene glycol 2025 (ave. mol. wt. 2000) --	13.5
Tergitol nonionic XD (polyalkylene glycol ether) --	4.8
Acrysol Ase-95 (acrylic emulsion copolymer) ----	3.5
Water -----	76.0
Sag 471 (silicone oil) -----	1.5
Triethanolamine, 99% -----	.7

The method of use of the present invention involves combining the cleaning composition of the present invention into a hot water system such that it is present in a proportion sufficient to form the protective film and to exert the lubricating and cleaning action set forth in the objectives of the invention.

The polypropylene glycol component serves both as a lubricant and as an anti-foaming agent.

The tergitol component is a detergent which acts as a wetting agent and emulsifier. It has an apparent specific gravity of 1.053 and a surface tension of 38 dynes/cm. at 25° C. It has a solidification temperature of 28° to 38° C.

The acrysol component is a thickener and a stabilizer. It is an acid-containing, acrylic emulsion copolymer manufactured by the Rohm & Haas Company of Philadelphia, Pa. See Rohm & Haas bulletin RC-11 of April 1969.

The silicone oil does not readily break down and adds lubricating qualities and life to the over-all mixture as well as helping the other materials act faster.

The triethanolamine component serves to thicken the mixture as it acts upon the acrysol component, with the triethanolamine component serving to raise the pH of the mixture to about 9.5.

In a preferred formulation method the tergitol was heated to about 120° F. and dissolved into water. This is followed by the addition in successive order of the polypropylene glycol component, the acrysol component, the silicone oil and finally the triethanolamine to bring the mixture to a pH of 9.5.

An alternate formulation technique involves melting the tergitol and dissolving the melted tergitol in the polypropylene glycol. The acrysol is then added followed by the water. After this the silicone oil is added, and finally the triethanolamine is added to bring the solution to a pH of about 9.5.

The composition of the present invention is simply added to a hot water system in an amount sufficient to be effective. One quart of the composition is sufficient for the hot water system in an average eight room house or approximately thirty gallons of water.

The boiler cleaning and lubricating composition, and method of use in hot water system have achieved excellent, if not amazing results in an industry that has been beset with problems of foul water conditions and a need for cleaning and lubrication of heating system accessories. The present invention achieves the following:

(1) The freeing of stuck hot water zone valves by removal of boiler sludge.

(2) The lubrication of hot water zone valves for continued efficient operation.

(3) The prevention of clogging in operating automatic hot water valves.

(4) The removal of insulating sludge from submerged hot water coils.

(5) Frees stuck flow valves.

(6) The precipitation of sludge to the bottom of the boiler where it may be run off, so that the water becomes clear.

(7) The lubricating qualities of the formula are enhanced by the presence of the silicone oil which extends their life.

(8) There is a dramatic reduction in further corrosion of the heating system.

(9) The composition of the present invention will not attack or distort rubber parts as do products containing hydrocarbon bases.

It can be seen that the present invention provides a unique solution to a long existing problem. While many compositions have been suggested which employ some of the components of the present invention, none of the prior compositions have been associated together in accordance with the present invention or in the proportions set forth in accordance with the present invention.

It is to be understood that the proportions of the present invention can be varied in some degree to the extent that the desirable qualities of the present invention are preserved. Also, it is conceivable that some substitution of equivalents as will occur to those skilled in the art, may be accomplished so long as the desirable qualities of the present invention are achieved.

Without further elaboration, the foregoing will so fully illustrate my invention, that others may, by applying current or future knowledge, readily adapt the same for use under various conditions of service.

What is claimed as the invention is:

1. A boiler cleaning and lubricating composition for use in a hot water system including zone valves comprising polypropylene glycol, average molecular weight 2000, present in a proportion by weight of 13.5 percent as a lubricant and anti-foaming agent; polyalkylene glycol ether, average molecular weight 2500, present in a proportion by weight of 4.8 percent as a detergent-wetting agent and emulsifier; acrylic emulsion copolymer, present in a proportion by weight of 3.5 percent as a thickener and stabilizer; water, present in a proportion by weight of 76.0

percent; silicone oil, present in a proportion by weight of 1.5 percent as a lubricant; and triethanolamine, 99 percent, present in a proportion by weight of 0.7 percent as a thickener and to raise pH.

2. A method of cleaning and lubricating a hot water system including zone valves which comprises adding to said system a composition consisting of polypropylene glycol, average molecular weight 2000, present in a proportion by weight of 13.5 percent as a lubricant and anti-foaming agent; polyalkylene glycol ether, average molecular weight 2500, present in a proportion by weight of 4.8 percent as a detergent-wetting agent and emulsifier; acrylic emulsion copolymer, present in a proportion by weight of 3.5 percent as a thickener and stabilizer; water, present in a proportion by weight of 76.0 percent; silicone oil, present in a proportion by weight of 1.5 percent as a lubricant; and triethanolamine, 99 percent, present in a proportion by weight of 0.7 percent as a thickener and to raise pH.

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