

# Diruneutra-

## A Fast and Safe Solution for High Temperature Critical Utility Systems

Over time, critical utility systems operated at elevated temperatures such as clean steam generators, clean steam distribution, vapor compression distillation and multi-effect distillation systems generate “high temperature rouge. This high temperature rouge is comprised of hematite and magnetite, mobile rouge and stable rouge, red rouge and blue/black rouge. Below is a summary of the three types of rouge commonly discussed and the characteristics of each.

Rouge Type	Chemistry	Color	Temperature
Type 1	Iron hydroxide, $Fe_2O_3 \rightarrow$ Hematite	Red/Brown	> 50 C
Type 2	Iron hydroxide, $Fe_2O_3 \rightarrow$ Hematite	Red/Brown	> 50 C
Type 3	$Fe_3O_4 \rightarrow$ Magnetite	Blue/Black	> 90 C

It is known that mobile rouge shall be removed from such critical utility systems as it will migrate downstream causing rouge to form in USP systems, WFI systems, process vessels and any equipment in which WFI is used for formulation or clean steam is used for sanitization.

It is also understood that magnetite (stable rouge, often blue/black in color) shall not be removed from such systems due to the damaging and dangerous chemicals required to do so. These stable forms of rouge do not migrate and therefore, do not pose any risk to downstream systems.

There are many options when it comes to removing type 1 or type 2 rouge, however Ultraclean’s specially formulated chemistry called Diruneutra is the fastest, safest and most effective option available. This unique residue-free formulation will not permit any precipitation and thus will not plague the system with weeks of high particulate count and prolonged high conductivity as many conventional methods do. The Diruneutra formation is fast acting and fast rinsing with no possibility of residual particulate upon completion as it is pH neutral before, during and after. Due to the absence of pH change and a strong chelating agent, particulate formation is not possible.

The following MEF still header was derouged with Diruneutra to illustrate Diruneutra’s ability to act faster and provide exceptional results compared to conventional chemistries. This specimen was completely derouged in 28-minutes. The photos below illustrate the results.

