



## Hale Products, Inc. Service Bulletins

Bulletin#: SB-87 Revision#: A Date: 5/05/2006

Product Type Covered: Hale Pump ☒ Hurst Tool ☐ Lukas Tool ☐

Product Covered:

Use of Zinc or Magnesium Consumable Anode

### Problem Statement:

Anodes are required to prevent galvanic corrosion to the pump in many installations

Written by: Tracey Barnes Date: 3/28/2005

Approved by: Michael A. Laskaris, PE

Product Manager: Gary Handwerk

Customer Service Designee: John Costello

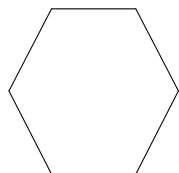
### Body of the Bulletin

#### Hale Products, Inc. offers two types of anodes for pump protection from galvanic corrosion.

Galvanic corrosion occurs when different conducting materials are connected and exposed to fluid. Galvanic corrosion results in corrosion of the less resistant (anodic) of the two metals, while the more resistant (cathodic) metal is protected. Utilizing the proper sacrificial (consumable) anode extends the life of the pump by corroding the anode instead of the pump. Pumps where there is a significant amount of stainless steel manifolds bolted to a cast iron pump are especially prone to galvanic corrosion. Decreasing water quality across certain regions and the popularity of stainless steel manifolds make this a more common issue in modern Fire Apparatus.

All installations, can utilize consumable anodes to extend the life of the pump.

Hale offers two types of consumable anodes.



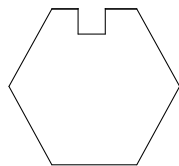
ZINC ANODE  
HEX HEAD

#### ZINC ANODE:

Zinc consumable anodes are recommended for all pumps where corrosion is an issue, including brackish or salt water exposure as well as poor quality fresh water.

Part Number: 029-0510-00-0 Zinc Anode

Part Number: 529-0080-00-0 Zinc Anode w/ Flange Kit



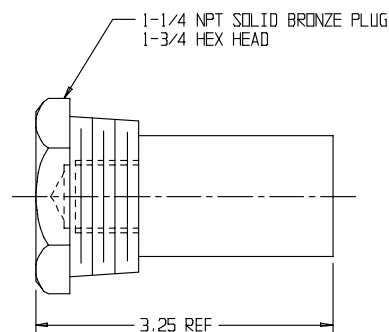
MAGNESIUM ANODE  
HEX HEAD

#### MAGNESIUM ANODE:

The new magnesium consumable anodes are available when the pump already uses a zinc anode and galvanic corrosion of the pump is still a concern. Note notch in the hex head.

Part Number: 029-0510-01-0 Magnesium Anode

Part Number: 529-0080-10-0 Magnesium Anode w/ Flange Kit



In order to retain their effectiveness, **anodes must be inspected and replaced at regular intervals** as they are consumed. **Note that magnesium anodes** must be inspected at least three times as often as the zinc anodes, as they are consumed at a faster rate. Anodes need to be replaced when more than 75% of the volume has been consumed. (New anodes are 1 1/4" diameter (32mm) x 2 1/8" (54mm) long)



## Hale Products, Inc. Service Bulletins

### **Anodes should be installed on both the suction and the discharge manifolds.**

Typically, one anode is placed in each suction tube, close to the pump and one in the discharge manifold. The trend towards stainless manifolds and valves increases the need for anodes in all pumps. Smaller cast iron pumps such as booster pumps installed with stainless steel manifold systems have a greater tendency towards galvanic corrosion. This can cause leakage in relatively short periods of time depending on local water quality. The cast iron portions of the pump near the bronze clearance rings and / or near the stainless steel connections can experience extremely accelerated wear.

### **Anodes are required more now than ever before.**

As mentioned above stainless plumbing and poor water contribute to the need for anodes. In addition, the poly and fiberglass water tanks on trucks do not have their own anode like galvanized steel tanks did. Since there is not an anode in the tank, there should be anodes in the pump. Anodes are inexpensive preventative measures against pre-mature pump failures from galvanic corrosion.

### **Hale continuously strives to improve our products and serve our customers.**

Preventing galvanic corrosion by using the proper anode can extend the life of any brand of fire pump and avoid unnecessary repairs. Anodes can be effective on all pumps, even stainless steel pumps where galvanic corrosion can also occur between brass and stainless steel parts.

### **Additional Galvanic corrosion information:**

A measure of how dissimilar metals will corrode when placed against each other in an assembly, is shown in the chart below. Metals close to one another on the chart generally do not have a strong effect on one another, but the farther apart any two metals are separated, the stronger the corroding effect on the one higher in the table. Poor water quality can affect corrosion. Anodes help protect the pump and the ferrous plumbing components. This is the same type of anode that is used in most home water heaters to protect against corrosion over the life of the unit. This protection is also recommended for fire pumps.

<b>Electrode Potential at 77 F (25 C)</b>		
<b>Anodic end (this is where the corrosion occurs)</b>		
<b>Element</b>	<b>Standard Electrode Potential (Volts)</b>	<b>Anodic</b> ↑  ↓ <b>Cathodic</b>
Magnesium	-2.34	
Aluminum	-1.67	
Zinc	-0.744	
Iron; Mild Steel	-0.44	
Yellow Brass	-0.35	
Stainless Steel	*	
Gold	1.42	
<b>Cathodic end, passive - (no corrosion here)</b>		

*\*Stainless steel alloy values have been omitted from this table as they can significantly change their potential and become much more active if exposed to stagnant or poorly aerated water (i.e., pumper tanks, fire hydrants, etc.,).*