



<b>Application Note to the Field</b>	<b>Why are some Stainless Steel Pump Parts Magnetic?</b>
<b>Application Note Number:</b> 1602-3	<b>Date:</b> Feb. 2, 2016; Revised Sept. 2022

### **Why are some Stainless Steel Pump Parts Magnetic?**

Some stainless steel parts can be attracted to magnets, or have the magnets attracted to them. This phenomenon most often occurs with cast stainless steel parts, which includes the housings of Liquiflo's H-Series and 3-Series gear pumps as well as the volutes and impellers of the centrifugal pumps.

There is nothing to fear, and it is normal for this to occur. The short reason is: because it is a casting grade called CF8M. This grade is considered equivalent to the wrought stainless steel alloy ANSI 316 for a wide variety of industrial and chemical purposes.

The longer answer is: the CF8M grade contains about 5-20% of a crystalline structure, called ferrite, which is magnetic. The majority of the remaining percentage of the stainless steel is a crystalline phase called austenite, which is non-magnetic. The ferrite structure, caused mainly by a 0.75% increase in silicon, and a 4% increase in chromium, gives the cast version of this type of stainless steel higher yield strength, improved resistance to stress corrosion cracking and better processing during casting and welding.

The drawback to the ferrite structure is a reduction in impact toughness at temperature extremes (above 1000°F and below -300°F), which does not have much impact on applications for Liquiflo's products. Ferrite also makes the alloy more difficult to roll into sheets and bars, which is why its formation is prevented in the wrought 316 SS version.