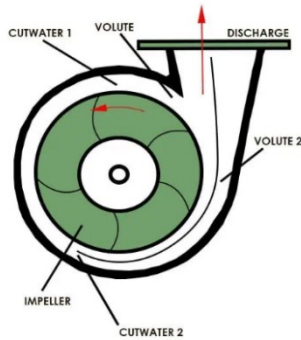


## The Importance of a magnetic filter and water inhibitor in hydronic systems <sup>1</sup>



Almost all hydronic systems have at least one wetted component made of cast iron or steel such as pump volutes<sup>2</sup>, expansion tanks, etc.

All hydronic fluids also contain some amount of air and we know when oxygen, water and iron or steel come together the result is corrosion (iron oxides), some of which is magnetite.

Magnetite is a naturally occurring material, is black or brownish-black with a metallic luster that can be seen in rocks and black beach sand, and has a Mohs hardness rating of 5 to 6 which is equivalent to a knife blade or glass. Magnetite material found in hydronic systems looks like extremely fine sand, almost like a black sticky powder.



Magnetite gets into tight spaces such as valve seats and packings, and wetted bearings, for example, where friction can cause wear, seizing, leaking and mechanical failure.

Today's Electronically Commutated Motor (ECM) pumps contain strong permanent magnets in the rotor. The buildup of magnetite can occur in the wetted rotor/canister sections of ECM circulators and stop them pumping.

Also, magnetite can settle out and build up on the surface of a heat exchanger. When this happens, it acts as an insulator and significantly reduces heat transfer and system efficiency. If there is no method of separating the magnetite, the bottom of the heat exchanger is where magnetite can collect and cake-up.



<sup>1</sup> Reference: <https://www.caleffi.com/en-us/blog/do-i-really-need-magnetic-dirt-separation-my-hydronic-system>

<sup>2</sup> Reference: <https://waterpumptools.com/pump-volute/> A pump volute is a critical component in centrifugal pumps. It is a curved funnel that increases in area as it approaches the discharge port. It converts kinetic energy into pressure by slowing down the fluid speed while increasing pressure.