



### **STORAGE AND HANDLING INFORMATION FOR FERROUS SULFATE HEPTAHYDRATE**

Ferrous sulfate heptahydrate (FSH) is an iron salt that has seven water molecules contained within its crystal structure. While this makes ferrous sulfate easy to dissolve and easy to blend in liquid processes, long-term dry storage can be problematic in terms of caking. As a result, Crown Technology cannot make any guarantee with regard to flowability of the product.

Caking is 'the agglomeration, or collection, of free-flowing particles over time' and can lead to problems in handling and processing. Although it is an inherent property of the material, Crown makes every effort to minimize caking of its FSH product through stringent temperature control during manufacturing and packaging. While product caking can never be completely prevented, proper storage and handling procedures, including avoiding hot storage conditions as well as the use of anti-caking agents, can also help to delay the caking process and prolong its free-flowing character. If caking is problematic, the product can be easily broken up through conditioning of the product before use. Practicing First In, First Out (FIFO) inventory control will also help keep the product in optimal condition.

Why does caking occur? A brief description of the mechanism by which caking occurs will help to illustrate how and why proper storage is critical. Temperature variations within a package of FSH can cause water within the FSH crystal to evaporate from the warmer material and subsequently be adsorbed onto cooler crystals. In this way, salt bridges and caking can be formed even within completely sealed packaging. Thus, it is easy to see how warm conditions can increase the issue of caking. Regrettably, even optimal conditions cannot ultimately prevent caking; rather, it can only help to delay it. When and to what extent caking occurs is dependent on the temperature and relative humidity at the time of manufacture, throughout storage and during transportation conditions.

For any questions or further information, please contact your distributor or Crown Technology Inc. representative.

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