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Total U.S. Dry Mix Mortar Additives Market

Industry Challenges

Challenges

Figure 3-1 shows the impact of top four industry challenges for the total U.S. dry mix mortar additives market from 2009 to 2015.

Figure 3-1

Total Dry Mix Mortar Additives Market: Impact of Top Four Industry Challenges (U.S.), 2009-2015

Challenge	1-2 Years	3-4 Years	5-7 Years
Shrinking profit margins discourage manufacturers			
Consolidation activities increase product expectations			
Conflicting masonry requirements of workability versus structure			
Mortar additives themselves may create new problems			

Source: Frost & Sullivan

Shrinking Profit Margins Discourage Manufacturers

Inflated raw material costs, along with increasing energy and transportation costs, are creating major financial challenges for the construction chemical manufacturers in general. However, though price increases are a common response from manufacturers, they result in shrinking profit margins. Crude oil price increases have negatively impacted the dry mix mortar additives market in the United States. Redispersible powders, such as synthetic polymers, are affected by crude oil price changes. For instance, Wacker Chemie AG increased the prices of its Vinnapas® dispersions and dispersible polymer powders globally in 2007. Prices are increased by manufacturers tend to reduce demand and volumes because small and regional mortar formulators are unlikely to bear such price increases.

Inflation in energy and feedstock prices is one of the biggest challenges faced by the construction chemicals market. This has led to the trend of sustainable manufacture that is increasing in importance. Manufacturers are trying to find ways of reducing operating costs to compensate for the bigger component of raw material cost. Operating efficiencies are expected to result in reduced processing time, less raw material wastage, and lower energy requirements. Operating efficiencies may also involve the recycling and recirculating of water in the production of specialty chemicals such as mortar additives. Manufacturers also have to resort to several customer-focused strategies that differentiate their product from other products and simultaneously justify the increased prices. For instance, product innovation, value-added services to customers, and technical support are some of the competitive strategies that help in retaining customers, despite the increased prices. As volumes are retained, profitability can also be maintained.

Consolidation Activities Increase Product Expectations

The mortars, and the related additives markets, are dependent upon the construction market in the United States. The construction market is developing according to the macro-economic trends and a slowdown has been witnessed in recent years in the U.S. and western European markets. The construction market is in a consolidation phase and manufacturers face a higher degree of regulations. Thus, dependent markets such as mortars and additive chemicals are ensuring that product developments are in line with the trends such as construction speed, convenience for workers/inhabitants, safety, and environmental issues such as energy and health.

The construction chemicals market is becoming increasingly competitive due to consolidation. Thus, construction chemical suppliers turn to product innovation and value-added services to stay ahead of the competition. For instance, Tremco Incorporated has launched tools such as LEAN management techniques and Six Sigma tools to tackle inefficiencies in different areas of processing and distribution. This is expected to result in process improvements, logistics, and customer satisfaction. They continually work toward the development of a value-added position for their customers so that customers are convinced about selecting them as their supplier of choice.

Leading construction chemical manufacturers continue to expand their operations worldwide. Most of the additives such as cellulose ethers and redispersible powder markets in the United States and Europe are consolidated. In June 2007, Wolff Walsrode's cellulosic's business unit was acquired by Dow Chemical. Consolidation increases the price sensitivity of the market and thus puts a price pressure on small and regional mortar formulators that may not be able to withstand it. Participants might start exploring lower-priced alternatives and substitutes for current additives.

Sika Corporation strengthened its polymer flooring business in North America through two acquisitions. Sika's U.S. subsidiary, Sika Corporation, acquired Valspar's commercial and industrial polymer flooring business. This business generated a revenue of $xx.x million in 2007. Additionally, Sika Corporation acquired the commercial and industrial polymer flooring business of ICS Garland, Inc. (now rebranded ICS Building Technologies). This business generated a revenue of $xx.x million in 2007. The ICS polymer flooring business owns a portfolio of epoxy, polyurethane, and electrostatic sensitive devices (ESD) technology products. Thus, ICS is also a good fit for Sika's growth strategy in North America.

Conflicting Masonry Requirements of Workability Versus Structure

Portland cement-lime (PCL) is sometimes used in mortars. High-strength mortars with high Portland cement content are most effective when freeze-thaw action are expected to be high. Mortars with high lime content have lower strengths but high resistance to moisture penetration. Masonry cement mortars are commonly used due to their convenience and good workability. However, masonry cement mortars are not considered to be as reliable or effective as PCL mortars with respect to bond strength and moisture penetration resistance.

One of the primary reasons for the lower reliability of masonry cement mortars is that the manufacturers of proprietary masonry cements do not disclose their product compositions. Various manufacturers mix different amounts and chemistries of ingredients—this leads to inconsistent performance. In terms of composition by volume, masonry cement is made of 50 percent Portland cement, whereas the other xx percent is pulverized inert limestone (a fine non-cementitious aggregate) in the form of filler. Additives are added to the cement mix to provide workability, water retention, and air entrainment.

The second reason is that masonry cement mortars have air entrapped to the extent of 20 percent, making the mortar more workable. However, higher air content also means that a lower amount of cementitious material is expected to be in contact with the brick. This results in less surface adhesion and reduced bond strength between the mortar and substrate or units (for example, brick). Additionally, the air voids are expected to allow more moisture to penetrate through the mortar.

The third reason is that masonry cements contain negligible or no hydrated lime, though inert limestone may be present. Hydrated lime is needed for autogenous healing that helps seal voids or cracks caused by poor workmanship or shrinkage and to provide additional strength. As hydrated lime is lacking, the strength of masonry cements is less and there is spontaneous sealing of voids or cracks that may form in future. PCL mortar is known to bond the brick well, but this can pose a problem for most masons. Masons usually prefer masonry cement mortars over PCL mortars because PCL mortars are too hard to get off the brick. In most cases, masonry cements must be used with skill and caution to be really effective.

ASTM C1329-00 'Specification for Mortar Cements' covers the mortar cements. Mortar cements are similar to masonry cements. However, they differ in terms of their ceiling on the maximum air content (xx percent for types M and S and xx percent for types N and O and a minimum bond wrench strength specified. Mortar cements are expected to overcome some of the issues with the masonry cement.

Mortar Additives Themselves May Create New Problems

Additives have been traditionally used to modify the properties of wet and set mortar. However, some of them create unwanted problems and have to be avoided or used in carefully determined dosages. Air entraining admixtures are often added to improve mortar workability and durability but research has shown that air content more than xx percent in the mortar is likely to increase moisture penetration and reduce bond strength. Antifreeze chemicals are sometimes added to reduce the freezing point of the mortar, allowing the bricks to be set in cold weather conditions. However, effective quantities of antifreeze chemicals are quite large, reducing the bond strength and contributing effflorescence and spalling (flaking, peeling) in the brickwork. Calcium chloride is used as an accelerator and helps in speeding up the hydration of the mortar in cold weather conditions. This eliminates the need for separate heating of the mortar materials. However, calcium chloride tends to corrode reinforcement (for example, steel wire or rods) embedded in the mortar. Non-chloride additives such as nitrates are increasingly replacing chlorides as accelerators, and also contribute to the efflorescence potential in mortars.

Trends

Figure 3-2 lists the market and technological trends for the total U.S. dry mix mortar additives market in 2008.

Figure 3-2

Total Dry Mix Mortar Additives Market: Market and Technological Trends (U.S.), 2008

Rank	Market and Technological Trends
1	Fast-setting renders (FSR)
2	Mortars based on calcium aluminate
3	Self-leveling floor screeds
4	Fourth-generation superplasticizers for dry mix mortars
5	Mortar additives in energy-efficient buildings
6	Lightweight aggregates replace conventional ones
7	Advanced granulated/encapsulated silicones as mortar additives
8	Automated metered dosing for dry mix mortars

Source: Frost & Sullivan

Fast-setting Renders (FSR)

FSR can be developed with the replacement of ordinary Portland cement (OPC) with another type of cement in a mix. The setting time of this render can be adjusted using the dosage level of a retarder (for example, tartaric acid) or using an accelerator (for example, Culminal X8308 from Aqualon/Hercules). When the render sets or hardens faster, it allows the craftsman or mason to work faster on the mortar compared with normal renders. Retarding the setting with a retarding admixture, such as tartaric acid, will lead to lowered resulting strength of the hardened mortar. Reactions of accelerators and retarders of various chemistries are variable for different cement grades. Thus, new dry mix mortar formulations, whether simple or complex, must undergo testing in the laboratory and in the field.