



Additive Suppliers Focus on Innovation for Future Growth

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Globalization and consolidation in the paint and coatings industry, rising raw material and energy costs, and increasing regulatory pressures each independently can have dramatic effects on the additives market. Today, producers face all of these issues in combination. Innovation, industry players say again and again, is imperative for maintaining competitive advantage.

Additives used in paints and coatings serve to enhance the performance of formulations and generally provide characteristics otherwise unattainable. Numerous classes of additive types based on a whole host of chemistries interact with resin, solvent, or water and other additives to improve such properties as adhesion, open time, flow, foaming, as well as resistance to microbes, corrosion, and UV damage.

The global market for additives used in paints and coatings is estimated to be \$4.8–\$5.0 billion by the consulting and market research firm, The ChemQuest Group, Inc. This sector is growing slowly overall at 1–2% per year, with most types of additives only experiencing demand increases between 0–1%. Defoamers, wetting agents, and adhesion promoters show the greatest potential, with growth rates of 4–5%.

Sales in North America total \$1.3 billion, while in Europe they are valued at \$1.8 billion. Asia and the rest of the world account for the remainder.

Regional growth rates differ widely, with emerging markets experiencing the greatest increase in demand. The Asian additives market, including biocides, rheology modifiers, foam control agents, dispersants, wetting agents, UV stabilizers, and slip/rub agents is valued at \$1.5 billion and growing at 9% annually, according to a market research study by Kusumgar, Nerlfi & Growney (KNG) that was published in May 2008 (title: *Asian Coating Additives*). By 2012, total sales of these additives into paint and coating applications will be worth \$2.25 billion in Asia.

Countries covered in the study include China, India, Japan, Korea, and others such as Indonesia, Malaysia, Vietnam, and the Philippines. Not surprisingly, demand for additives is growing the fastest in China (13% per year) and slowest in the mature Japanese market (1% per year). According to Steven Nerlfi, a principle consultant with KNC, about 20 companies in this market have sales between \$20 and \$150 million, but there are many, many smaller players vying for market share.

EMERGING MARKETS

"There has been an explosion in China. Manufacturers are utilizing technology developed in the rest of the world and have not needed to go through a process of evolution like Western industry did," Nerlfi notes. "All of the major global players have developed a presence in China, with manufacturing sites and technical support, R&D, and sales centers—which has also contributed to the advanced technology in place." These companies are positioning themselves to serve the growing market for paint additives in China, India, and other developing countries in Asia as per capita income increases and people have money to spend.

The growth potential of emerging markets such as China, India, Eastern Europe, and Latin America is a positive trend for the paint and coatings industry overall, including additive suppliers. The growing number of players in these emerging markets, however, presents a challenge to established producers.

"The U.S. and European markets are being flooded with products from other parts of the world," says Dan Murad, president and CEO of The ChemQuest Group. Defoamers, surfactants, and flow and leveling aids, in particular, are experiencing increased competition and pricing pressure. "In particular, new Asian suppliers, with product offerings across all additive categories, have made their presence felt with an ever increasing range of low-priced additives in global markets," adds Andre Bendo, industry manager, Business Line Coatings, with Ciba Corporation.

"Formulators looking to gain as much value as possible while still maintaining performance are enabling the entrance of these new players, who are breaking price paradigms," Murad further notes. The trend could lead to the commoditization of some additives, which

would benefit formulators as long as quality and performance remain consistent and at appropriate levels.

GLOBALIZATION AND CONSOLIDATION OF THE CUSTOMER BASE

The shift to a focus on emerging markets is only one aspect of the globalization of the paint and coatings industry. Additive producers are finding that formulators are looking for suppliers that can provide consistent quality and competitive pricing to locations around the world.

Sandeep Goel, North American specialty additives marketing manager for paints and coatings materials with Rohm and Haas Company, believes that "in addition to finding ways to reduce both 'product' costs and the 'formulated' costs of their customers, geographic diversity and greater participation in rapidly developing

economies will enable suppliers to better align themselves with customer trends towards globalization. This will also help offset the lower demand in North America." Jim Reader, Air Products' section manager for applied technology in Asia, agrees emphatically that the ability to work as a global supplier to multi-nationals is a vital new competency required of additive suppliers.

As globalization has occurred in the paint and coatings industry, consolidation of the sector has taken place at a rapid pace. "Consolidation has become a fact of life in the coatings industry," states Kevin R. Lassila, Ph.D., director of technology at BYK USA Inc. "The net effect on additives suppliers is that it has raised the stakes of the game. As smaller companies are acquired,

larger ones generally standardize formulations, resulting in greater sales for additives producers who provide the most value, and less for those who don't. The winners often end up with a much deeper relationship with the customer and the opportunity to enter into preferred supplier or joint development arrangements."

Part of the challenge is due to the fact that much less consolidation has taken place in the additive supplier base, according to Laurie Marshall, North American marketing manager at Air Products. One positive result, though, has been that paint formulators now view additive suppliers as a problem-solving resource. "The impact of an additive on the performance of a coating is critical," Marshall says, "and companies with expertise

Leading Additive Suppliers to the Asian Coatings Market

Adeka
Altana (BYK Additives & Instruments)
American Chemel (only cuprous oxide)
Arch Chemicals
Ciba
Deuchem
Elementis
Evonik
Hercules Incorporated
Kusumoto
Nordox
Rohm and Haas Company

Source: Kusumgar, Nerlfi & Gimmey

Sales of Additives for Paints and Coatings in Asia

Additive Type	Annual Sales (Millions)	Growth Rate (wet lb basis)
Biocides	\$400-450	6%
Rheology modifiers	\$350	9%
Foam control agents	\$200-\$300	9%
Dispersants	\$200	9%
Wetting agents	\$90	9%
UV stabilizers	\$90	9%
Slip/rub agents	\$80	11%
Total	51500	9%

Source: Kusumgar, Nerfci & Gowney

in surface science and the ability to understand the impact of additives on primary performance properties, such as wetting, retraction, hiding, durability, and water sensitivity, are positioned to provide the level of technical support coating manufacturers are looking for."

Some additive types are more affected than others. For biocides, according to David Sutton, North American marketing manager for industrial biocides at Rohm and Haas Company, customer consolidation is a critical issue. "As the customer base shrinks and becomes more global, it will put tremendous price, product, and service requirements on biocide suppliers. A focus on development of sustainable biocide treatments and a global supply and regulatory support capability to meet customer needs is absolutely necessary."

REGULATORY PRESSURES

Sustainability, "green" technology, and regulatory compliance also top the list of key issues for the additives industry. "Regulatory and societal pressure to reduce the environmental impact of coatings systems is driving the industry to reformulate to compliant systems, resulting in the need for new additive technologies," says Lassila. The environmental characteristics of the additives themselves are now also being scrutinized, even though they represent only a very minor part of the composition of paint.

Michael Hoppe, product manager for coatings additives with Cognis Corporation Functional Products, notes that "in 2008 and beyond, as companies try to comply with evolving regulations while being faced with increasing costs for fossil fuel, there will be an increasing need to come up with higher performance 'green' additives and coating formulations."

Suppliers are also faced with increasing costs associated with the regulations themselves. These growing ex-

penses could in some cases result in the withdrawal of products from the market and may also reduce new product development efforts. "Some small additive companies will find it a challenge to meet the requirements of regulatory programs such as REACH in Europe, and will need to decide whether or not the benefits of supplying products to those regions outweigh the cost of compliance," Mural comments.

In addition, according to Donald A. Shaw, Ph.D., vice president and general manager of Troy Asia Pacific and vice president of development for Troy Corporation, increasing regulation is placing a tremendous financial burden on suppliers at the same time consolidation within paint and additive producers is driving these companies to seek cost savings to justify their consolidation. "The greater regulatory burden will more than likely drive further consolidation as suppliers try to achieve the scale necessary to be able to afford the cost of developing/maintaining a broad portfolio of products."

The reduced number of active substances available to formulators and consumers will also lead to increased competition, with suppliers offering the same substances in different forms or combinations. Shaw remarks that in the past, non-biocidal performance additives have historically been less impacted by regulation, but with the introduction of REACH in the European Union, all additives will be affected.

One concern relates to the requirement to disclose information on composition of products. "Availability of this long-held trade secret information will lead to generic competition in areas where intellectual property laws are not fully developed," claims Shaw. This is an example of how two current trends are working in opposition. Regulatory costs to support products are rising at the same time as generic competition is attempting to drive value down. "These two factors, taken together, have a dramatic impact on the amount of resources available for use in developing next-generation products," states Shaw.

On the positive side, the reduction of allowable levels of VOCs and other components such as allylphenol ethoxylates (APEOs) and hazardous air pollutants (HAPs) has changed the market's needs for both composition and performance of additives. "This changing landscape has led to the need for increased product development and next-generation additives, and made the chemistry of the additives as it pertains to all of these changing regulations increasingly important to the customer," asserts Marshall.

At Dow Coating Solutions, the need for regulatory compliance and the drive for sustainable products are understood to provide opportunities for new product development. "We don't view this issue as a need to fix

things, but as a chance to innovate and create new value," says Wendy Hoenig, R&D vice president of Dow Coating Solutions.

RIISING RAW MATERIAL AND ENERGY PRICES

Finding areas of opportunity that enable additive producers to provide added value is critically important as energy and raw material prices continue to spiral. Volatile raw material prices have changed the cost scenario for many additives, according to Don Poucher, vice president of Southern Clay Products. "Historically, raw materials have been a relatively fixed portion of the cost equation. In recent months, however, raw material pricing has been marked by dramatic and rapid changes. Coatings customers accustomed to firm pricing for additives now are faced with the kind of fluctuating pricing once reserved for commodity chemicals."

The rising cost of crude oil and natural gas also places significant pressure on additive manufacturers. "Many suppliers have difficulty passing these cost hikes on to downstream customers due to the soft paint and coatings market conditions in the U.S.," notes Ning Chen, North American business director with Rhodia Novecare. The cost pressure is higher for those additives that are most sensitive to crude oil price movement and refinery capacity. Additives, which require longer production times, elevated temperatures/pressures or use raw materials with few producers, are most at risk, according to Andre Bendo. However, all additives are affected by the general energy supply situation in the market.

INNOVATING FOR SUCCESS

For each of the challenges faced by additive suppliers, introducing innovative additives that enable coating formulators to differentiate their products, while keeping costs low and providing regulatory compliance, seems to be the best solution. "With changing legislation and technology advances, new functional additives are constantly in demand," Bendo stresses.

"New product development is crucial to stay ahead of the game—in particular, developing products that are environmentally friendly paired with high performance," states Susanne C. Kuehne, market segment manager—coatings for Grace Davison. "The coatings market is a mature market, and it has become more difficult to truly differentiate products nowadays. Paint manufacturers may be trying more and more to achieve unique and special effects through additives."

As the number of additive suppliers and competitive products has increased, successful producers have turned to innovation to maintain their market position. "This situation has had a positive impact on the industry, with additive suppliers developing more customized products to meet the specific requirements of their customers," notes Sandeep Goel.

For long-term success, though, additive suppliers must show the value-added benefit of any new technology introduced to the marketplace, according to Bendo. "Market driven additives exhibiting improved performance and value will ensure quick adoption," he notes. This is increasingly true as competition from lower-cost producers in emerging regions continues to grow. "Existing suppliers need to differentiate their offerings to improve value products and shift the markets towards higher performance," he adds.

Improved functionality is a key criterion for success. "Formulation optimization in light of numerous regulatory constraints is multi-faceted, and the role of the additive in providing the desired performance characteristics is of ever-increasing importance," Marshall remarks.

Emphasis is also being placed on multi-functionality as a means for reducing the number and quantity of additives necessary for a given formulation. "With higher solids formulations, dilute, mono-functional additives will have a difficult time competing with new technology that addresses a number of needs," says Poucher.

Developing new additives based on alternative raw materials will also be important for the industry. "The desire for diminished environmental impact will continue to be the dominant trend driving change in the coatings industry," asserts Lassila. "There is also likely to be increasing emphasis on sustainability, with increased utilization of bio-based raw materials in coatings formulations and in the manufacture of additives."

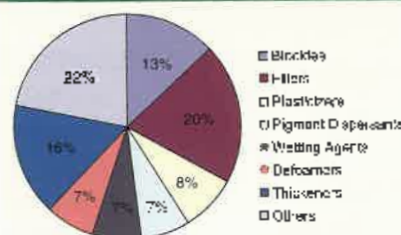
The additive market will continue to face the challenge of raw material costs and some short supply situations in the next few years, according to Chen.

Suppliers are actively seeking new ways to minimize their exposure to key, tight raw materials.

Development of next-generation products based on alternative raw materials and technologies is one approach.

Many companies are placing an emphasis on developing additives that allow customers to create new water-based coating formulations that are compliant with international regulations. "The key is to de-

North American Coatings Additives Market—\$1.3 Bn



Source: The ChemQuest Group, Inc.

velop these products without compromising any performance properties," says Hloppe. "It is also very important to use natural raw materials for producing both existing and novel additives where it makes sense to do so."

Speeding up innovation will also be important. "In the long run, improving the product development process must occur in order to increase efficiency and address performance, regulatory, and cost issues all together," Chen adds.

Gaining a better understanding of how additives interact with one another and other ingredients in the formulation will be crucial for developing more effective products. "We have specifically included additives as part of our Dow Coating Solutions business because they are an important component of any coating. Developing new coatings requires a mix of technology and formulary experience, and learning how to use different additives together and with different resins will help us identify potential new solutions and functionalities," Hoenig says.

Some are concerned, though, about the level of basic research being carried out in the industry. "Many suppliers are focusing on functional improvements that have a higher probability of short-term success, rather than investment in basic research, which has a longer payback period," worries Shaw. How this change in emphasis will impact the industry will not be known for some time.

In the next five years, though, Troy expects that additive companies that capitalized on technology will become the main suppliers to the market. "To be able to successfully navigate the challenging environment of today's marketplace, companies must be driven by a combination of product technology and regulatory expertise," Shaw believes.

EXAMPLES OF INNOVATION

Air Products

- Dynol 607 acetylenic-based alternative for environmentally persistent fluorochemical surfactants that offers surface tension reduction, improved flow and leveling, and reduced surface defects
- ZetaSpense range of low-VOC, APE-free, and HAPS-free pigment dispersants
- Carbowet 106 and 109 APE-free wetting agents

BYK Chemie USA

- NANOBVK® 3810 and 3812 UV stabilizers based on ceria nanoparticle dispersions that offer protection against UV-B radiation and complement

other BVK nano zinc oxide-based products that provide UV-A protection

- DISPERBYK® 2009, 2010, and 2025 wetting/dispersing agents that provide improvements in the performance of silica-based matting agents in high-solids solventborne or 100% solids systems, waterborne systems, and solventborne systems, respectively; based on Controlled Polymerization Technology
- DISPERBYK 2163 and 2164 cost-effective alternative to caprolactone-based wetting and dispersing additives for solventborne coatings and pigment concentrates
- BYK® 4500 and 4510 adhesion promoters

Ciba Corporation

- Ciba® TINUVIN®-DW series of zero-VOC encapsulated UV absorbers and hindered amine light stabilizers (HALS) for water based formulations; allows removal of co-solvents while providing improved coating protection
- Ciba EFKA® 4585 waterborne dispersant for improved waterborne dispersions of inorganic and organic pigments, especially carbon black, allowing higher pigment loadings; based on Controlled Free Radical Polymerization

Cognis Corporation

- Loxanol EFC series of low-VOC, low-odor coalescents allow paint application at lower temperatures and high humidities while still providing improved scrub resistance, gloss enhancement, and improved rheology modifier efficiency; based on renewable materials
- FoamStar A-45 low-VOC, mineral oil-free defoamer effective against microfoam without reducing gloss; provides fast bubble-break and effective in highly tinted systems
- DSX 3220 high performing, solvent-free, VOC-free associative thickener designed for premium coatings; launching in the second quarter of 2008
- Expansion of global technical support centers in the U.S., Germany, and China

Dow Coating Solutions

- ECOSURF SA7 and SA9 low-foam surfactants based on seed oils
- Acquired IPBC (3-iodo-2-propynyl butyl carbamate) technology (through Dow Biocides) and developing new antimicrobial products based on this technology

- CANGUARD Ultra BIT 20 low-color, low-pH, formaldehyde-free in-can preservative based on benzothiazolone (BIT) and formulated for low-VOC coatings; to be introduced in North America in late 2008
- ANGUS AEPB VOX 1000 non-VOC, multi-functional amine for low-odor, non-yellowing water-based paints that have a low vapor pressure; allows for improved open time and wet edge without compromising scrub resistance
- Expanding coatings laboratories in the U.S. and China, including high throughput research capabilities in both locations

Grace Davison

- SYLOID® C 2006 matting agent with additional functionality that improves mar and scratch resistance and also provides chemical resistance in certain paint systems

Rhodia Novecare

- Rhodafac® phosphate ester-based surfactants
- Rhodoline® phosphate ester based dispersants
- Low-VOC, APE-free, and FDA-approved Rhodoline® phosphate ester-based defoamers
- Rhodoline additives designed to improve freeze-thaw stabilities, open time, and gloss
- Established new paint lab Center for Research & Technology (Bristol, PA) for customer support and new product development

Rohm and Haas Company

- Rocima™ 586 zero-VOC, dual action biocide containing KATHON and Bronopol

- Dosemater™ biocide dosing systems providing greater options for safe handling of biocides
- Acrysol™ RM 895™ solvent-free, hydrophobically-modified ethylene oxide urethane (HEUR) rheology modifier for enhanced viscosity stability to colorant addition and improved sag resistance
- Acrysol RM-3000 solvent-free, nonionic, HEUR rheology modifier with uniquely Newtonian viscosity versus shear rate profile that provides good film build and flow and leveling
- Tamol™ 945 low-foaming polycarboxylic acid pigment dispersant supplied at 45% solids in the sodium form for waterborne formulations; compatible with a variety of rheology modifier chemistries and provides heat age and viscosity stability; efficiently disperses mineral slurries

Southern Clay Products

- Optiflo® IVS VF for stabilization of viscosity upon addition of tint in VOC-compliant formulations
- Cloisite® nanoclays are lightweight replacements for commodity fillers and additives such as talc, calcium carbonate, and fumed silica that offer improved surface characteristics

Troy Corporation

- Zero-VOC Polyphase® 800 broad spectrum dry film series biocides offering combined fungicide/algacide performance; launched in the EU and Asia
- Formaldehyde-free Mergal® 700 range of broad spectrum biocides
- Troysan® 1050 cost effective, high performing antibacterial product 