

# European Chemicals Update

Q4 2015

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## The Global Food Additives Market

### Food Additives Market Introduction and Key Trends

The global food additive market has recently faced strong growth. Drivers have been rising consumer awareness for natural ingredients, increasing demand for additives promoting health and wellness as well as the expansion of processed and convenience food in emerging economies.

*This edition of the Duff & Phelps European Chemicals Update features a snapshot of the food additives market.*

Food additives comprise various chemical substances which impart specific properties to foods. An additive may be incorporated into a finished product to improve protection against harmful bacteria and other kinds of microbes to prolong shelf life. It also imparts characteristics such as flavor, color and taste of food and increases its nutritional content.

The global food additives market was estimated to be valued at USD 37.9bn in 2014 and is projected to exceed USD 50bn by 2020.

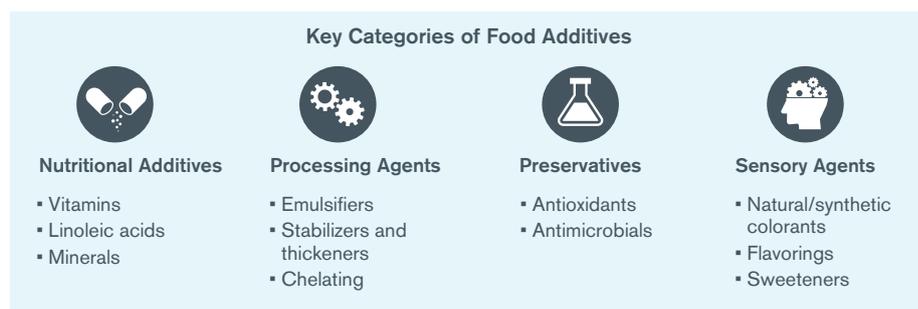
The first major trend for growth comprises the consumers' move towards natural ingredients as consumers are turning away from synthetic food additives in favor of more natural compounds. This development is most evident within sectors such as flavors and colors and most apparent in Europe and North America. Also, demand for alternative sweeteners is expected to remain high as food and beverage manufacturers are pressured by consumers to reduce sugar levels in their products.

The second major trend relates to consumers' demand for food and drinks that foster health and well-being. Consumers around the globe develop an increasing awareness of the

correlation between diet and health and seek diets with reduced amounts of sugar, salt and saturated fats.

The third major trend concerns the expansion of the processed and convenience food industry in emerging markets, typically driven by countries with rapidly increasing urban populations in parts of South America, Asia-Pacific and the Middle East.

Selected key players in the global market include Archer Daniels Midland Company (US), BASF SE (DE), Cargill Incorporated (US), CHR. Hansen Holding (DK), DuPont (US), Israel Chemicals Ltd. (IL), Ingredion Incorporated (US), Kerry Group Plc (IE) and Novozymes A/S (DK).



Source: Food Additives Industry Analysis Report, Grandview Research, Food Additives – A Growing Global Market, Leatherhead

### Selected Transactions

**Xiamen Kingdomway Group Company has acquired Vitatech Nutritional Sciences, Inc.**

September 2015



Xiamen Kingdomway has completed the acquisition of Vitatech Nutritional Sciences, a US-based manufacturer of nutritional and dietary supplements and nutritional products.

*Duff & Phelps acted as exclusive financial advisor to Vitatech Nutritional*

Source: Mergermarket

**Caldic B.V. has completed the acquisition of R2 Group A/S**

September 2015



Caldic has acquired R2 Group, a Denmark-based company engaged in manufacturing and distributing food ingredients, material science and health and pharma products.

**Total purchase consideration:**  
~EUR 67m (14.3x EBITDA)<sup>(1)</sup>

Source: Capital IQ, Mergermarket

**Israel Chemicals Ltd. has acquired Prolactal GmbH**

March 2015



ICL has completed the acquisition of Prolactal, an Austria-based producer of dairy proteins and other ingredients for the food and beverage industries with annual revenues of approx. EUR 100m.

**Total purchase consideration:**  
n/a (9.0x EBITDA)<sup>(2)</sup>

Source: Capital IQ

(1) Based on 2014A EBITDA of R2 Group  
(2) Based on 2015E EBITDA

## The Global Food Additives Market

### Interview with Hezi Israel, Executive Vice President, ICL



**Hezi Israel**  
Executive Vice President of Business Development and Strategy, ICL

Hezi Israel is a member of the senior ICL management and plays an integral part in ICL's strategy execution and driving its international growth.

He was promoted to Executive Vice President, Business Development and Strategy of ICL in 2015.

Previously, he served as Vice President, Business Development, Strategy and M&A of ICL as well as of the Industrial Products segment after joining the company in 2007.

From 2000 – 2007 he served at Teva in the areas of business development and global merger and acquisition activity. From 2003 – 2007, Mr. Israel was the head of Teva's business development department and a member of the executive management team of the international cluster.

Mr. Israel holds an M.B.A. as well as a B.A. in Economics and Political Science from Tel Aviv University.



*Israel Chemicals Ltd. (ICL), is a leading multi-national specialty minerals company based in Tel Aviv with sales of approx. USD 6.1 billion in 2014. Founded in 1968, it operates in three primary end-markets: agriculture, food and engineered materials. ICL produces approx. one third of the world's bromine, and is a leading producer of potash and pure phosphoric acid.*

*ICL is a public company, dual-listed on the New York Stock Exchange and the Tel Aviv Stock Exchange.*

*ICL announced its "Next Step Forward" strategy in 2013 and since then has transformed its business through a series of strategic initiatives and M&A activities.*

*ICL's strategy execution included inter alia a joint venture with Yunnan Yuntianhua in China to secure raw materials sourcing, the acquisition of a European whey producer as well as several portfolio adjustments to strengthen its focus areas. In addition, ICL has recently signed a memorandum of understanding with Leviev Group to establish a phosphate joint venture in Namibia.*

#### **Mr. Israel, could you give an introduction to ICL's "Next Step Forward" strategy and its underlying drivers?**

Unlike many of its competitors, ICL is not a pure potash or phosphate player, but rather an integrated value chain player with a unique business model. We start with the exploitation of core minerals, such as potash, bromine and phosphate, and refine them through sophisticated production processes realizing substantial synergies as the output of one process step is input for the next.

In order to remain closely engaged with the end user at the downstream-end of the value chain, our specialized technical teams develop downstream products and tailored client solutions.

As a result, our specialty business has a growing share in our revenues and profit.

To give an example, we are the only phosphate player in the world that starts at raw material exploitation and covers all downstream processes towards its blue-chip customers in the food industry. ICL delivers across the entire value chain which clearly differentiates ICL from its competition.

ICL's strategy comprises three pillars: growth, efficiency and enabling platform and as a result of our strategic review, we focus on three core markets: agriculture, food and engineered materials.

Agriculture, for us, is synonymous with the fertilizer market, where we produce potash, phosphates and specialty fertilizers. We have a long term view on potash, where we believe that a shift towards a more balanced application of nitrogen, phosphate and potash will drive demand for phosphates and potash in emerging markets like India, Southeast Asia and Latin America. Another expansion area is the specialty fertilizer market for soluble and coated fertilizers, where we address the needs of customers in the field of high cash crops for increased efficiency and improved fertilization and provide complete solutions for players in the agriculture market leveraging our broad portfolio.

With regard to the food market, customers strive for healthier, more nutritious food with less fat and sodium but will not compromise for taste and mouth feel. We provide tailor-made solutions, since our phosphate products offer special functionality concerning texture and stability.

In addition, we are able to add new ingredients such as proteins and combine them with phosphates strengthening the solution space in texture and stability.

## The Global Food Additives Market

### Interview with Hezi Israel, Executive Vice President, ICL

Nevertheless, our strategy is not only about growth. Since we are running large scale operations, we need to ensure that we are well-located on the cost curve.

We strive for best in class operations and have identified saving potential of USD 350m to be achieved until year end 2016. In order to realize these savings, we implemented specific measures and divested our non-core activities.

#### Market drivers in the food additives markets differ across geographic regions – have you adjusted your strategy to meet these geographic and cultural differences?

##### ICL Food Specialties

ICL Food Specialties' global strategy focuses on providing ingredient systems that deliver texture and stability to food and beverage products. ICL understands the global trends that inspire food and beverage product development. Current trends in the industry include reduced sodium, lower fat and sugar, gluten- or egg-free, convenience, health & wellness, demand from aging population (also for enhancement of foods with proteins, fibers or minerals) and natural /organic or "clean" label. Our ingredients enable these innovations.

Global Food's main customers are local, regional and multinational food producers in the meat, bakery, dairy and beverage segments. ICL's production and blending sites are located in Europe, North America, Brazil, China, and Australia. Exports service other countries.

Our goal is to leverage the experience we gained in Western markets to expand our activity in emerging markets.

Our analyses showed that significant demand for sophisticated solutions also exists in emerging markets, and therefore, we decided to go full steam ahead and expand local operations. For example, we identified growth opportunities in China and Brazil, where we are establishing new R&D labs and technical teams that will develop specialized formulations for key local customers.

#### In order to leverage the identified opportunities, what role does inorganic growth play in your strategy?

Everything starts with our strategy. After establishing our core segments, we pursued a growth strategy based on both internal and external growth. The internal growth is about expanding our resources and our footprint in key markets through expanding our potash production in Spain, develop and promote Polysulphate, our new natural fertilizer, opening R&D labs and application centers, as well as more projects we are currently developing.

Simultaneously, we identified external growth opportunities with a specific list of targets in each of the agriculture, food, and engineered materials clusters. For example, we recently completed a strategic transaction in China, by creating a phosphate joint venture with Yunnan Yuntianhua, China's leading manufacturer of phosphate fertilizers with a goal to transform the JV's operations from commodity to specialty. We further decided to develop the downstream business of ICL and, especially in the food segment, focus on the ingredients we need to own in order to create synergies with our phosphate platform. Following this line of reasoning, we acquired Fosbrasil, the leading purified phosphoric acid producer in Brazil and further expanded our solutions offering through the acquisition of Prolactal, a European whey protein producer.

We partly financed these acquisitions by divesting our non-core activities which generated net proceeds of USD 250 million to date and Duff & Phelps acted as advisor for the divestment of our cleaning and hygiene business. In summary, we worked from the macro to the micro level, defining attractive targets and then proceeded to a 1-by-1 execution in phosphate, potash and food.

#### Could you elaborate on the rationale of the joint venture with Yunnan Yuntianhua in China you just mentioned?

We had to undertake a journey around the world in order to identify the most suitable platform to develop specialty phosphates and China was the most fitting. The ICL model in the phosphate industry is quite unique as we use 70% of our phosphate rock for specialty production, while the industry usually uses 70% of phosphate rock for commodity products.

We will transfer this model to our joint venture in China, which will continuously increase specialty products production versus commodities production. This is a transformative move for the joint venture and will improve competitiveness and capture future growth opportunities since market demand in China is expected to shift towards specialty phosphate applications. The joint venture will also add ammonia-based fertilizers to our product portfolio.

##### Joint Venture in China

**Current status:** Established as of October 12, 2015

**Parties:** ICL Group and Yunnan Yuntianhua, China's leading phosphate producer

**Positioning:** Phosphate JV with a leading position in China's phosphate sector, operating an integrated phosphate platform

**Product focus:** Up-stream mining, bulk fertilizers and down-stream businesses in specialty fertilizers and other specialty phosphates for foods and engineered materials

**Annual production capacity:** ~2.5 million tons of phosphate rock

**Further investment:** ~\$340 million over the next 5 years by ICL and Yunnan Yuntianhua

#### Being active across several geographic regions - how does ICL ensure to keep up with global innovation and trends?

ICL's innovation platform is composed of complementary global and local elements. In our food segment, we leverage the know-how that we have developed in the Western markets and apply it to emerging markets.

## The Global Food Additives Market

### Interview with Hezi Israel, Executive Vice President, ICL

However, one cannot simply apply globally developed solutions to local markets since customer needs differ across countries. For example, the Chinese sea food market demands different solutions compared to Europe and the US with regard to texture and stability. This requires the local development of specific formulations. Leveraging the know-how we have created over the last 30 years, we work with players in China in order to understand what kind of amendments, new ingredients and changes we need to make to the formulas to meet the respective customers' demands.

In order to apply the ICL model to the joint venture in China and to move towards a focused specialty production, we realized that we needed to establish a local R&D center, addressing the needs around specialty phosphates in China. Today, the new R&D center in Yunnan works on a number of projects. The same applies for specialty fertilizers and food applications in Brazil. There is a global innovation system within ICL and there are national application labs supported by local initiatives focused on providing new solutions to our customers. We create a combination of global innovation and local implementation.

We also opened an incubation platform that serves as a research center and collaborates with start-ups, universities and anyone in the industry that has ideas around phosphate, potash, fertilizers, bromine and the application of our key chemicals. Our ICL incubation program operates on a global basis and, to date, received more than 150 initiatives from researchers around the globe.

Therefore, we do not only foster internal research, but also support innovation outside the group.

#### **How satisfied are you with the current status of the ICL strategy and have you identified areas where the strategy will be subject to change in the future?**

We developed our M&A strategy in 2013, executed it in 2014 and 2015 is the year of completion. We are currently working with our global integration teams to maximize synergies.

We have also transformed ICL with regard to its efficiency. To give you an example, we broke down the silos separating the potash, phosphates and bromines segments, each having its own headquarters. We decided to move towards global units with a shared services concept. In addition, we set up a team of engineering experts that conducted a detailed review of the manufacturing processes and identified significant improvement potential in our daily operations.

We also established a group-wide procurement organization and centralized shared services in Amsterdam. With a total of USD 4 billion in purchasing, operating on a global consolidated basis will enable us to achieve significant savings. In the course of further efficiency processes in Israel, we reduced the number of employees in phosphates, potash and bromine and increased the production efficiency. Until now the savings from these measures have amounted to USD 120 million in 2014 and additional USD 120 million in 2015 compared to 2013. Therefore, we are on track to reach our goal of USD 350 million in cost savings by 2016 year end. However, the challenge is to maintain the mindset of creating savings over the long-term since we believe there is much more potential to unlock.

Overall, I am satisfied with the execution of the M&A transactions. In only one year from negotiations to completion, we were able to establish a joint venture in China, acquire Prolactal and Rovita in Europe, Allana Potash in Ethiopia, and Fosbrazil in Brazil – financed by the divestment of non-core activities; all while our organization is undergoing a fundamental transformation in terms of growth as well as in terms of operations and efficiency.

#### **Taking into consideration the current transformation of ICL uniqueness, where do you see the company in 2020?**

In 2020, ICL will be a different company – a company that will have established its global reserves, will have a wider footprint in the key markets and whose specialty portfolio will have increased substantially. By that time, we will already have transformed into a truly global player – a company with global resources and global operations. To support this transformation, we are already undertaking relocations, exchanging experts within the US, Europe, China and Israel to create a dynamic company and drive the integration of different cultures.

Furthermore, we were able to integrate the senior management of our acquisitions and allow them to actively participate in the change. To summarize, by 2020, we will have a global management team with global resources and will have expanded significantly in our key markets.

#### **Mr. Israel, we thank you for this interview.**

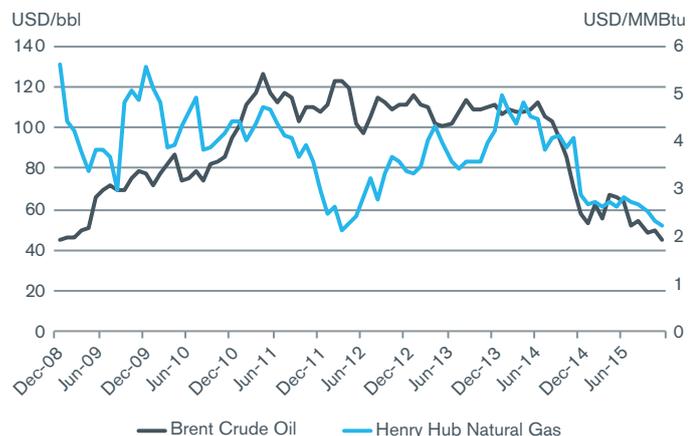
*This interview was conducted on December 1, 2015 with Mr. Israel participating via phone from Tel Aviv, Israel.*

# Quarterly Market Review

## Key Raw Materials

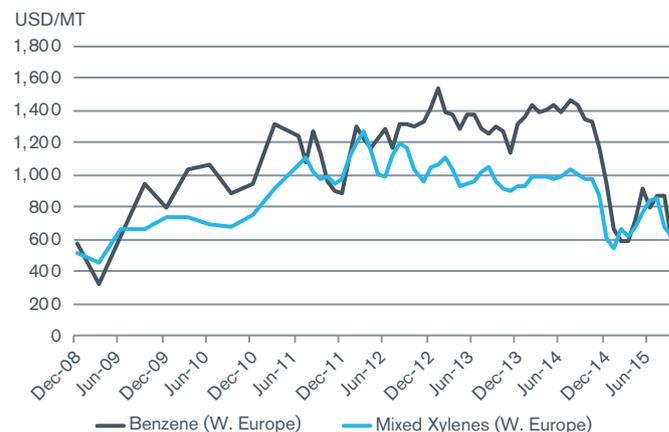
### Petrochemicals

#### Feedstock



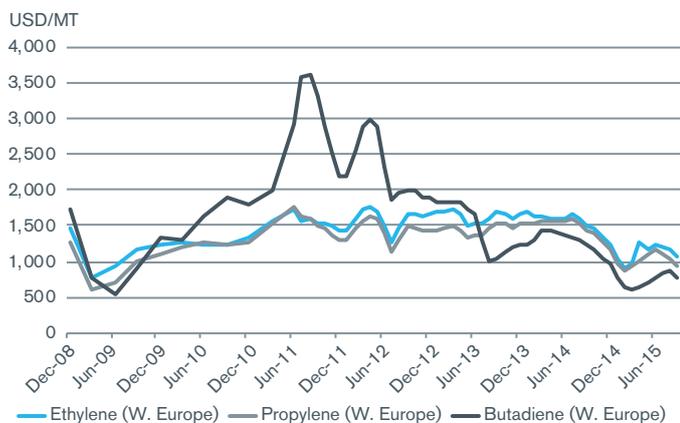
Source: Bloomberg as of November 30, 2015

#### Aromatics



Source: NEXANT Bloomberg, as of November 30, 2015

#### Olefins



Source: NEXANT, Bloomberg as of November 30, 2015

#### Key Observations

- Oil has slumped 40% since Saudi Arabia led OPEC's decision in November 2014 to maintain output and defend market share against higher-cost U.S. shale producers
- Low oil prices caused an increase in gasoline consumption, which in turn decreases the supply of xylenes and increases the supply of benzene. This has resulted in the benzene spread falling by 40% y.o.y. in 1H15. Due to accelerated gasoline consumption benzene continues to be severely oversupplied, causing the price and spread to retain its low level
- Low prices of oil have also put pressure on the ethylene cracker economics

Source: Bloomberg, KGI

## Raw Materials Wrap-Up

Product	Unit	Type	Delivery	Source	Date					Change	
					Q3 2014	Q4 2014	Q1 2015	Q2 2015	Q3 2015	q-o-q	y-o-y
Naphtha	USD/MT	1 Mo Fwd	CIF NW Europe	Bloomberg	804.4	431.5	488.3	524.1	416.5	(20.5%)	(48.2%)
Methanol	EUR/MT	Spot	FOB Rotterdam	Polymerupdate	325.0	287.0	311.0	303.0	252.0	(16.8%)	(22.5%)
Acrylic Acid	USD/MT	Spot	DDP W Europe	Tecnon Orbichem	1,903.0	1,665.0	1,374.0	1,537.0	1,459.0	(5.1%)	(23.3%)
Adipic Acid	USD/MT	Contract	DDP W Europe	Tecnon Orbichem	2,161.0	1,894.0	1,515.0	1,767.0	1,599.0	(9.5%)	(26.0%)
Caustic Soda (liquid)	USD/MT	Spot	DDP W Europe	Tecnon Orbichem	555.0	564.0	517.0	570.0	556.0	(2.5%)	0.2%
Chlorine (liquid)	USD/MT	Spot	DDP W Europe	Tecnon Orbichem	277.0	265.0	236.0	244.0	244.0	0.0%	(11.9%)
Ammonia	USD/MT	Spot	FOB Black Sea	Green Markets	530.0	500.0	410.0	400.0	400.0	0.0%	(24.5%)
Urea (prill)	USD/MT	Spot	FOB Black Sea	Green Markets	320.0	310.0	295.0	295.0	285.0	(3.4%)	(10.9%)

Source: Bloomberg

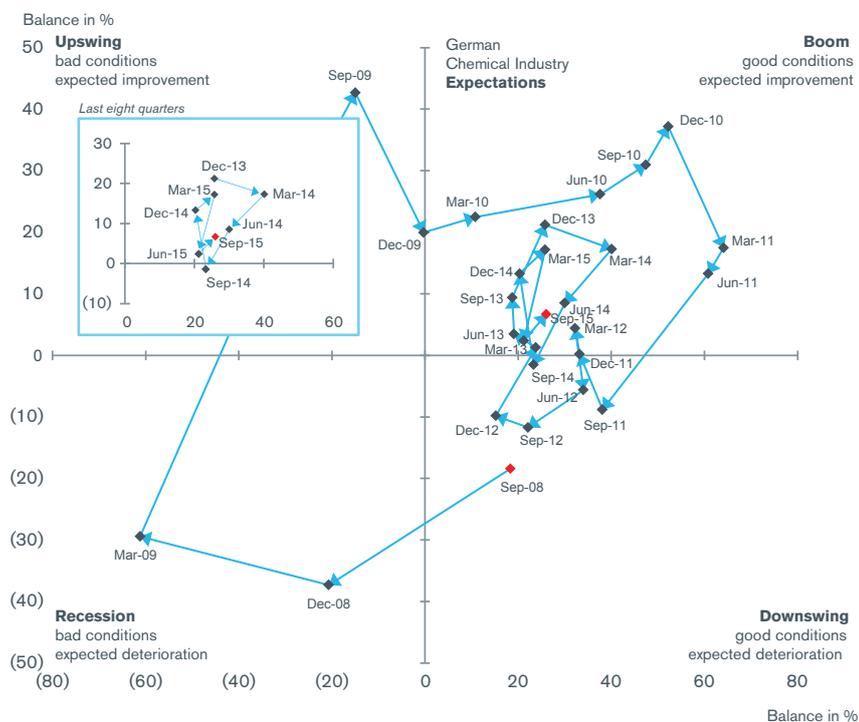
#### Definitions:

MMBtu - 1 Million British thermal units  
 Bbl - barrels  
 MT - Metric tons

# Quarterly Market Review

## Ifo Survey German Chemical Industry

### German Chemical Industry | Ifo Business Cycle Clock

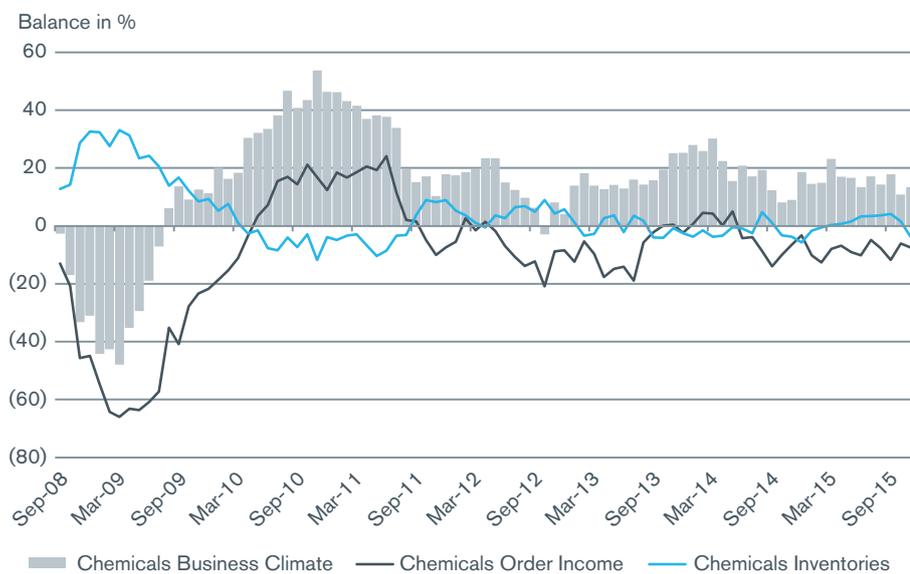


Source: Ifo Institut für Wirtschaftsforschung, Bloomberg as of November 30, 2015

#### Key Observations

- November conditions have contracted month-on-month by 4.0%, which has been the second downward movement in a row. A value of 21.5% means by definition that the German chemical industry is still in good shape, and relatively close to the 2015 maximum value of 26.0% reached in September
- Expectations recovered from minus 6.1% in October (the minimum value of 2015) to plus 2.1% in November, albeit the expectations are well below their maximum value of 17.2% reached in March 2015
- High volatility in expectations throughout the year reflect the uncertainty of the chemical industry in Germany despite its current good conditions.

### German Chemical Industry | Ifo Business Indicators



Source: Ifo Institut für Wirtschaftsforschung, Bloomberg as of November 30, 2015

#### Key Observations

- Chemicals business climate level recovered in November from its all year low in October, while still being well below its 2015 maximum of 21.4% in March.
- Inventory trend is strongly recovering (decreasing) the second month in a row after inventories had been increasing over an eight months period until September 2015
- Q4 order income was negative in November (as it has been for the entire year 2015) with only minor changes in the last months.
- A negative order income level indicates that chemical customers are hesitant to place orders

#### Explanatory note

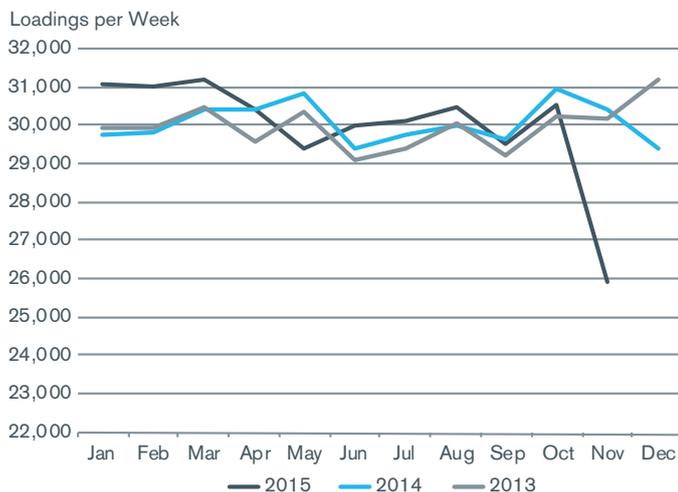
The Ifo Business Climate Index is based on ca. 7,000 monthly survey responses from firms in manufacturing, construction, wholesaling and retailing. The firms are asked to give their assessments of the current business situation and their expectations for the next six months. They can characterise their situation as "good", "satisfactory" or "poor" and their business expectations for the next six months as "more favourable", "unchanged" or "more unfavourable". The balance value of the current business situation is the difference between the percentages of the responses "good" and "poor", the balance value of the expectations is the difference between the percentages of the responses "more favourable" and "more unfavourable". The business climate is a transformed mean of the balances of the business situation and the expectations. For the purpose of calculating the index values, the transformed balances are all normalized to the average of the year 2005.

Source: Ifo Institut für Wirtschaftsforschung

# Quarterly Market Review

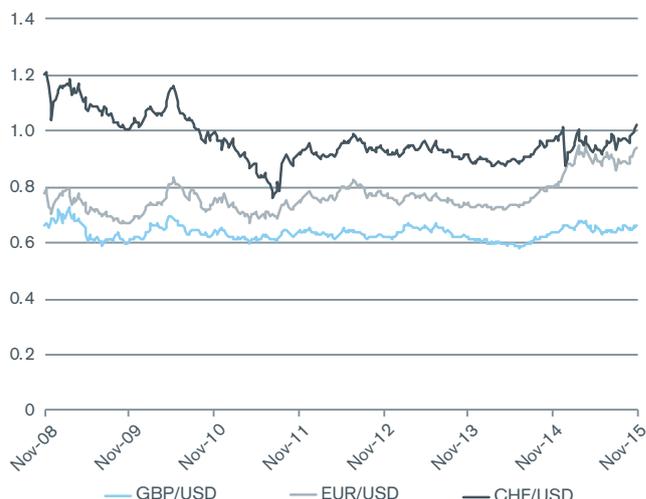
## Economic Environment

### US Weekly Railcar Loadings



Source: Association of American Railroads, Bloomberg as of November 30, 2015

### Currency Trends



Source: Capital IQ as of November 30, 2015

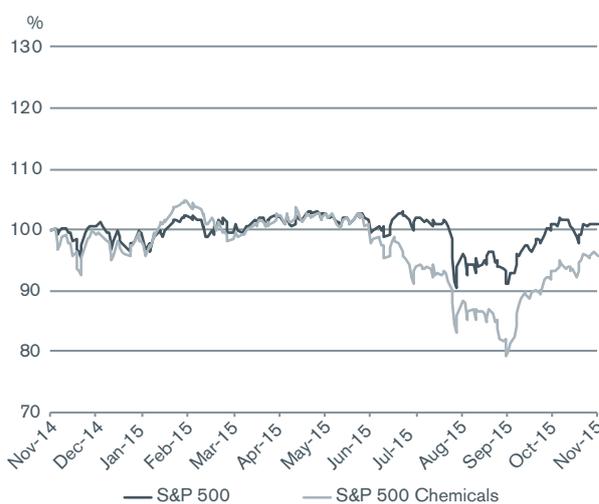
## Stock Indices: LTM Development in Europe and USA (Rebalanced)

### Europe: STOXX 600



Source: Bloomberg as of November 30, 2015

### USA: S&P 500



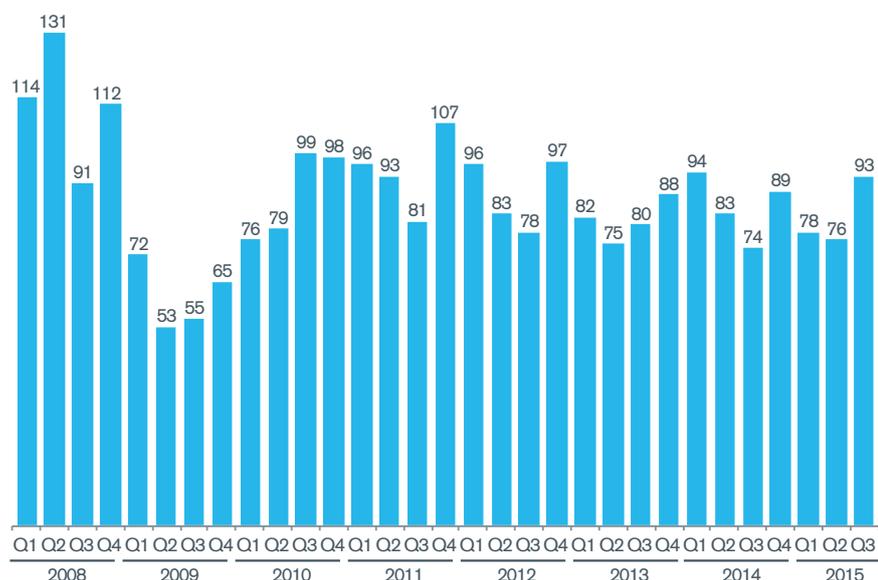
Source: Bloomberg as of November 30, 2015

## M&A Transaction Review

### Announced Deals

## European M&A Quarterly Trend

Number of Announced Transactions



Source: Capital IQ

### Key Observations

- Transaction values in Q3 2015 are available for 23 transactions (out of 93) summing up to a total value of 19.1bn EUR
- Top 10 transactions in Q3 2015 have a combined value of 18.8bn EUR
- The acquisition of European, North American and Global Distribution Businesses from OCI N.V. by CF Industries Holdings for a total consideration of 7.3bn EUR was the largest transaction by value in Q3 2015
- Screening includes transactions with target, buyer or seller from Europe
- Announced transactions include bids made, letters of intent, definitive agreements, and registered offerings (definition by Capital IQ)

## Top 10 European Deals Announced in H2 2015

EUR in millions

Announced	Acquirer	HQ	Target	HQ	Target Business Description	Stake Acquired	Transaction Value	Revenues (in EURm)	LTM EBITDA margin	EV / Revenue	EV / EBITDA
17-Nov-15	Air Liquide SA	FR	Airgas, Inc.	US	Airgas, Inc., together with its subsidiaries, supplies industrial, medical, and specialty gases; and welding equipment and related products.	100.0%	12,640.9	5,032.3	18.2%	2.5x	13.7x
6-Aug-15	CF Industries Holdings, Inc.	US	OCI N.V., European, North American And Global Distribution Businesses	NL	OCI N.V., European, North American and Global Distribution Businesses manufactures nitrogen based fertilizers, ammonia and methanol and distributes fertilizer products.	100.0%	7,330.0	-	-	-	-
29-Jul-15	Solvay SA	BE	Cytec Industries Inc.	US	Cytec Industries Inc. focuses on developing, manufacturing, and selling value-added products for aerospace and industrial materials, mining, and plastics industries.	100.0%	5,761.3	1,828.0	14.9%	3.1x	20.8x
13-Jul-15	Platform Specialty Products Corporation	US	Alent plc	GB	Alent plc supplies specialty chemicals and engineered materials used primarily in the electronics, automotive, and industrial end-markets.	100.0%	2,132.4	896.3	16.5%	2.3x	14.0x
22-Sep-15	Aramco Overseas Company B.V.	NL	Lanxess AG, Synthetic-Rubber Business	DE	Lanxess AG, Synthetic-Rubber Business manufactures tire & specialty rubbers (TSR) and the high performance elastomers (HPE).	50.0%	1,200.0	~3,000.0	-	0.8x	-
30-Nov-15	The Blackstone Group LP.; Kirkbi Invest A/S	US	Armacell GmbH	DE, DK	Armacell GmbH, together with its subsidiaries, manufactures insulation foams for the equipment-insulation market.	100.0%	955.0	452.2	15.7%	2.1x	13.4x
20-Jul-15	Parcom Capital; Gilde Buy Out Partners BV; ABN AMRO Participaties	NL	Koninklijke Ten Cate nv	NL	Koninklijke Ten Cate nv develops, produces, and sells functional materials, modules, and systems for the protection of people, and their working and living environment.	100.0%	921.5	1,115.5	8.5%	0.8x	9.3x
1-Jul-15	CF Industries Holdings, Inc.	US	GrowHow UK Group Limited	GB	GrowHow UK Group Limited manufactures fertilizers and plant nutrients.	50.0%	523.1	562.2	25.0%	1.7x	7.4x
21-Sep-15	Symrise AG	DE	Pinova Holdings, Inc.	US	Pinova Holdings, Inc. manufactures specialty chemicals from natural and renewable feed stocks.	100.0%	372.7	256.5	13.0%	1.5x	11.1x
15-Sep-15	Praxair Inc.	US	Yara International ASA, European CO2 Business	NO	Yara International ASA, European CO2 Business manufactures liquid CO2 and dry ice.	100.0%	218.0	112.0	19.2%	1.9x	10.1x

Includes announcements until November 30, 2015, Figures converted with exchange rate as per announcement date, respectively

Dates in blue are closed transactions as of November 30, 2015

Source: Capital IQ, Mergersmarket, Company Information

## M&A Transaction Review

### Strategic Alliances & Collaboration

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#### R&D

##### **BASF is substantially expanding the scope of its R&D capabilities**

*November 2015*

BASF is substantially expanding the scope of its research and development (R&D) capabilities in Asia Pacific. A EUR 90m expansion of the BASF Innovation Campus Asia Pacific, located at BASF's Greater China headquarters in Pudong, Shanghai, was initiated. In total, BASF aims to locate approx. a quarter of its global R&D activities in Asia Pacific.

Source: BASF press release as of November 9, 2015

##### **Syngenta and DSM announce a R&D partnership**

*November 2015*

The partnership aims to develop microbial-based agricultural solutions, including bio-controls, bio-pesticides and bio-stimulants. The solutions from the discovery platform would be jointly commercialized by the two companies.

Source: Syngenta press release as of November 6, 2015

##### **DSM and Evonik form partnership to develop omega-3 fatty acids for animal nutrition**

*July 2015*

DSM Nutritional Products Ltd. and Evonik Nutrition & Care GmbH have entered into a joint development agreement for algae-based omega-3 fatty acid products for animal nutrition, in particular in aquaculture and pet food applications. The aim is to meet the increasing demand for omega-3 fatty acids by harnessing naturally occurring marine algae using sustainable, biotechnological processes based on natural, non-marine resources.

Source: DSM press release as of July 29, 2015

#### Operations

##### **ICL enters into an agreement with Leviev Group to establish phosphate operations in Namibia**

*December 2015*

ICL signed a memorandum of understanding with LLNP Ltd., a subsidiary of Leviev Group, an international holding and investment company to perform a feasibility study to establish a world-scale phosphates and downstream production business in Namibia, including fertilizer-grade phosphoric acid, white phosphoric acid, bulk fertilizers and specialty fertilizers.

Source: ICL press release as of December 7, 2015

##### **BASF & SINOPEC inaugurate world-scale isononanol plant in Maoming**

*December 2015*

BASF and China Petroleum & Chemical Corporation (SINOPEC) have successfully completed an isononanol plant in Maoming, China. The plant will be the first of its kind in China, with an annual production capacity of 180,000 metric tons.

Source: BASF press release as of October 12, 2015

##### **Clariant closes strategic alliance with Beraca**

*November 2015*

Clariant acquired 30% of Beraca's shares in the health personal care division. The partnership is expected to generate "innovation synergies that will culminate in creating more value to the main stakeholders, especially the customers and partner sourcing communities".

Source: Clariant press release as of November 26, 2015

##### **Cross-sector JV H2 MOBILITY was officially presented in Berlin**

*October 2015*

Air Liquide, Daimler, Linde, OMV, Shell and Total will jointly develop a network consisting of up to 400 hydrogen stations across Germany.

Source: Air Liquide press release as of October 13, 2015

##### **AkzoNobel and Evonik form JV for chlorine/ potassium hydroxide**

*June 2015*

The 50-50 joint venture involves the construction and operation of a dedicated plant at AkzoNobel's existing site in Ibbenbüren, Germany. It will have an annual nameplate capacity of around 130,000 metric tons of potassium hydroxide solution and 82,000 metric tons of chlorine.

Source: AkzoNobel press release as of June 16, 2015

##### **Arkema and CJ CheilJedang build thiochemicals plant in Malaysia**

*June 2015*

The USD 450m investment is a two-part joint venture between Arkema and Korean CJ CheilJedang, that resulted in the first world-scale thiochemicals complex in Asia. The plants manufacture biomethionine for animal feed and methyl mercaptan and other substances to be used primarily for refining and soil fumigation.

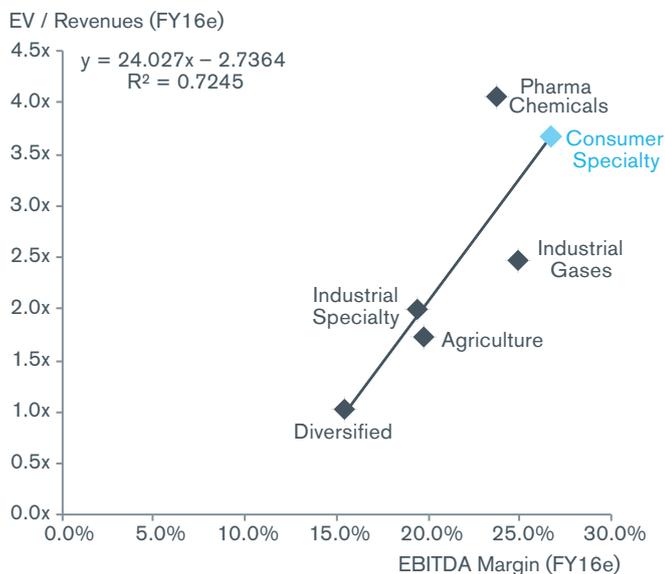
Source: Arkema press release as of June 4, 2015

# Public Trading Analysis

## Sub-Sector Summary

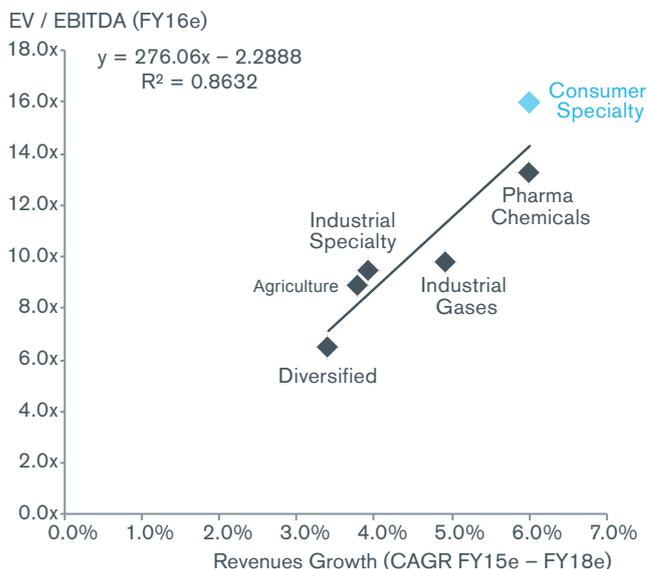
### Regression Analysis

EV / Revenues vs. EBITDA Margin



See page 13 for constitution of Sub-Sectors  
 Data point in blue is this edition's highlighted Sub-Sector (see page 12)  
 Source: Capital IQ as of November 30, 2015

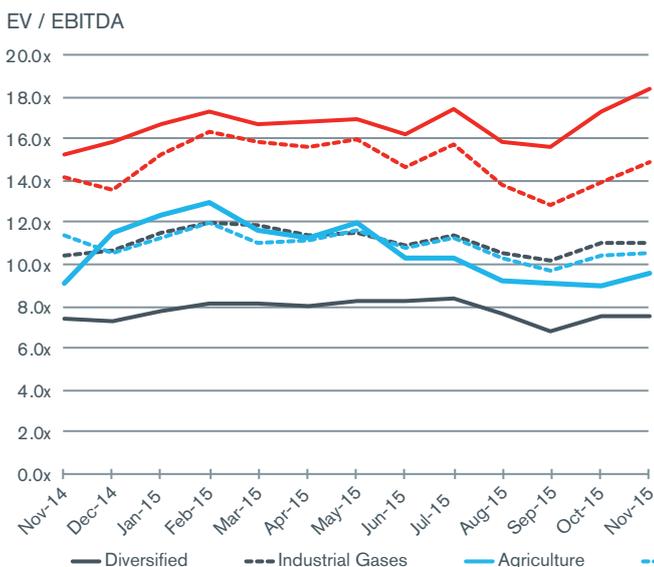
EV / EBITDA vs. Revenues Growth



See page 13 for constitution of Sub-Sectors  
 Data point in blue is this edition's highlighted Sub-Sector (see page 12)  
 Source: Capital IQ as of November 30, 2015

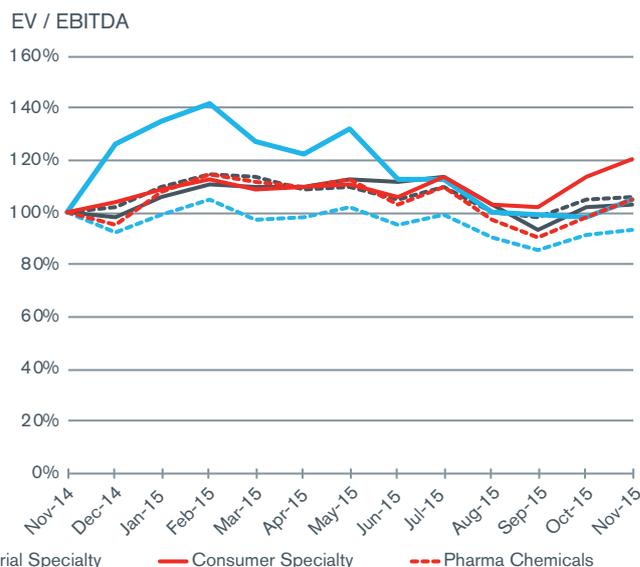
### Sub-Sector Trading Multiples (EV / EBITDA)

LTM Actual



Source: Capital IQ as of November 30, 2015

LTM Rebased



Source: Capital IQ as of November 30, 2015

**Definitions:**

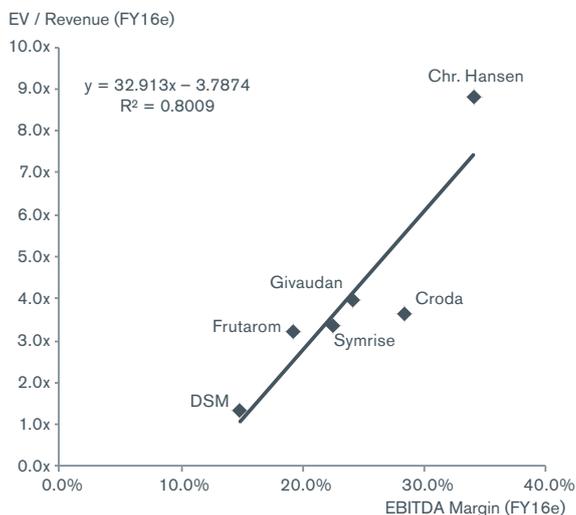
- Enterprise Value  
 Market Capitalization + Total Debt + Preferred Equity + Minority Interest - Cash and Short Term Investments
- EBITDA  
 Earning Before Interest, Taxes, Depreciation and Amortization
- LTM  
 Last Twelve Months

# Public Trading Analysis

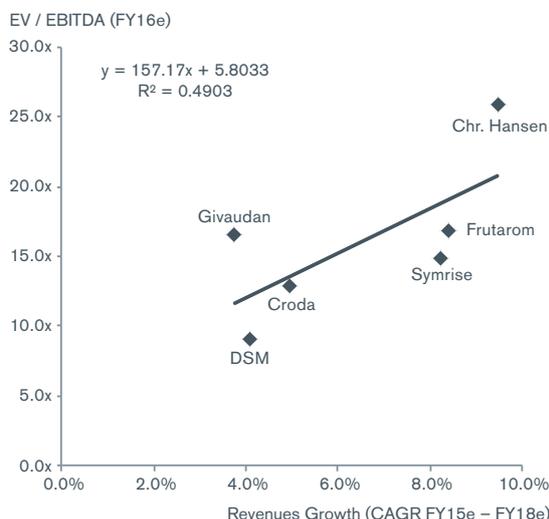
## Sub-Sector Focus: Consumer Specialty

### Regression Analysis\*

EV / Revenue vs. EBITDA Margin

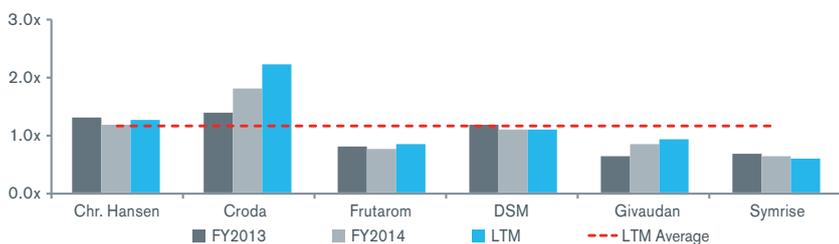


EV / EBITDA vs. Revenues Growth

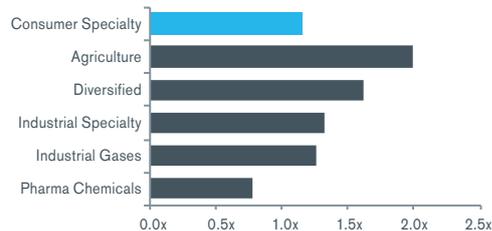


### Capex / Depreciation\*

Consumer Specialty

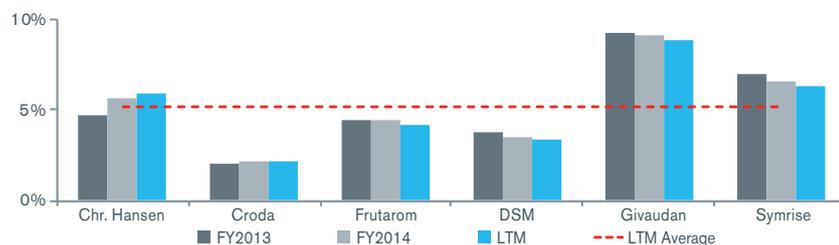


Chemicals Sub-Sector Average (LTM)

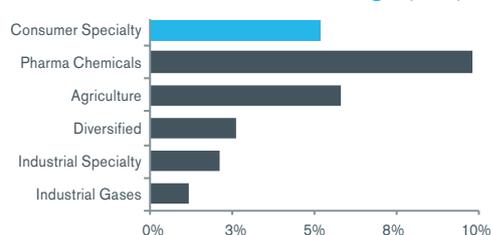


### R&D Expenditures in % of Sales\*

Consumer Specialty

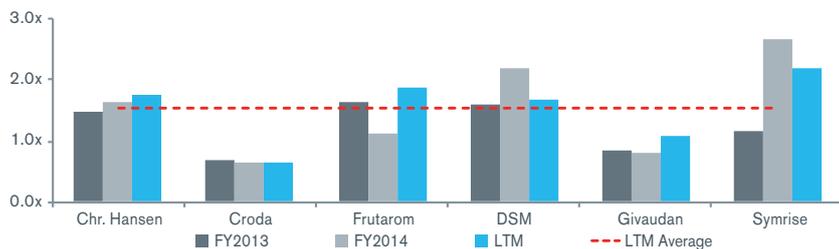


Chemicals Sub-Sector Average (LTM)

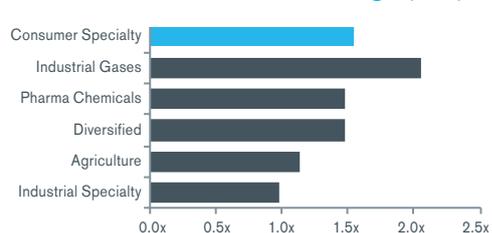


### Net Debt / EBITDA\*

Consumer Specialty



Chemicals Sub-Sector Average (LTM)



\*Source: Capital IQ, Bloomberg as of November 30, 2015

# Public Trading Analysis

## Company Trading Statistics

EUR in millions (except for per share data)													
Company Name	Price in EUR	52 Week in EUR			Market Cap	Enterprise Value	Revenues		EBITDA		EBITDA Margin	EV/EBITDA	
	30-Nov-15	Low	High	% of High			LTM	LTM	FY2016	LTM	LTM	FY2016	
<b>Diversified</b>													
Arkema S.A.	68.2	50.0	75.8	90%	5,070.0	6,737.0	7,354.0	951.0	1,120.9	12.9%	7.1x	6.0x	
BASF SE	78.2	64.4	97.2	80%	71,828.7	86,174.7	74,616.0	10,253.0	10,901.2	13.7%	8.4x	7.9x	
Clariant AG	17.5	12.4	20.0	87%	5,588.0	6,963.0	5,383.9	711.2	826.3	13.2%	9.8x	8.4x	
Evonik Industries AG	32.3	25.4	37.8	85%	15,031.8	14,079.8	13,535.0	2,223.0	2,458.3	16.4%	6.3x	5.7x	
Lanxess AG	48.2	33.5	56.5	85%	4,411.4	5,768.4	8,000.0	937.0	969.2	11.7%	6.2x	6.0x	
Solvay SA	109.1	88.0	141.1	77%	9,049.2	10,793.2	11,068.0	1,410.0	2,180.8	12.7%	7.7x	4.9x	
<b>Average</b>										<b>13.5%</b>	<b>7.6x</b>	<b>6.5x</b>	
<b>Industrial Gases</b>													
L'Air Liquide SA	115.5	93.0	124.0	93%	39,592.3	47,876.5	16,185.4	4,081.9	4,536.2	25.2%	11.7x	10.6x	
Linde Aktiengesellschaft	165.3	140.0	195.0	85%	30,684.8	39,799.8	18,015.0	3,813.0	4,421.0	21.2%	10.4x	9.0x	
<b>Average</b>										<b>23.2%</b>	<b>11.1x</b>	<b>9.8x</b>	
<b>Agriculture</b>													
Israel Chemicals Ltd.	4.8	4.5	7.3	65%	6,068.1	8,650.1	4,821.4	1,164.5	1,261.3	24.2%	7.0x	6.9x	
K+S Aktiengesellschaft	26.8	21.9	40.2	67%	5,135.1	6,103.8	4,203.0	932.2	980.6	22.2%	6.5x	6.2x	
KWS SAAT AG	289.0	255.2	314.5	92%	1,907.1	2,076.2	997.9	154.6	170.9	15.5%	13.4x	12.1x	
Syngenta AG	349.3	257.9	400.8	87%	32,008.5	34,993.2	12,801.9	2,497.5	2,794.5	19.5%	13.7x	12.9x	
Yara International ASA	43.8	32.1	48.4	90%	12,006.8	12,989.4	11,442.3	1,940.4	2,165.2	17.0%	6.5x	6.0x	
<b>Average</b>										<b>19.7%</b>	<b>9.4x</b>	<b>8.8x</b>	
<b>Industrial Specialty</b>													
Akzo Nobel N.V.	67.3	52.6	75.5	89%	16,669.4	18,899.4	14,817.0	2,010.0	2,217.8	13.6%	9.4x	8.5x	
EMS-Chemie Holding AG	386.3	291.7	436.5	89%	9,036.2	8,656.8	1,874.9	467.8	477.6	25.0%	19.3x	18.1x	
Johnson Matthey Plc	40.3	31.6	51.1	79%	8,184.7	8,821.7	14,935.2	799.7	877.5	5.4%	10.5x	10.1x	
Kemira Oyj	11.4	9.1	12.3	93%	1,728.9	2,430.2	2,321.1	275.8	326.5	11.9%	8.8x	7.4x	
Lenzing Aktiengesellschaft	74.0	48.5	75.7	98%	1,964.7	2,343.6	1,991.1	289.1	334.7	14.5%	8.1x	7.0x	
Sika AG	3,209.6	2,431.3	3,594.5	89%	8,139.2	8,403.3	5,039.7	748.9	832.8	14.9%	11.2x	10.1x	
Synthomer plc	4.6	3.0	5.2	88%	1,557.0	1,684.3	1,289.0	161.1	184.3	12.5%	10.4x	9.1x	
Tessenderlo Chemie NV	28.1	20.1	37.0	76%	1,203.1	1,271.4	1,534.4	159.8	201.6	10.4%	8.0x	6.3x	
Umicore S.A.	39.1	30.9	46.3	85%	4,265.2	4,690.8	9,872.1	423.0	536.9	4.3%	11.1x	8.7x	
Victrex plc	27.6	22.9	31.4	88%	2,348.6	2,288.5	357.3	161.6	180.3	45.2%	13.5x	12.7x	
Wacker Chemie AG	85.1	64.8	117.8	72%	4,227.1	5,482.7	5,257.8	945.1	1,058.9	18.0%	5.8x	5.2x	
<b>Average</b>										<b>16.0%</b>	<b>10.5x</b>	<b>9.4x</b>	
<b>Consumer Specialty</b>													
Chr. Hansen Holding A/S	59.4	33.6	60.5	98%	7,737.0	8,224.9	858.6	276.5	317.8	32.2%	29.7x	25.9x	
Croda International plc	40.9	35.2	44.9	91%	5,554.7	5,818.9	1,516.0	400.5	452.7	26.4%	14.4x	12.9x	
Frutarom Industries Ltd.	46.1	24.4	46.3	100%	2,706.3	2,989.3	761.1	139.5	177.5	18.3%	20.3x	16.8x	
Koninklijke DSM N.V.	48.2	41.0	50.4	96%	8,422.3	10,616.3	9,737.0	1,245.0	1,176.4	12.8%	8.5x	9.0x	
Givaudan SA	1,710.2	1,400.8	1,794.0	95%	15,754.5	16,656.1	4,215.6	880.1	1,008.9	20.9%	19.7x	16.5x	
Symrise AG	64.1	47.7	64.5	99%	8,315.8	9,526.9	2,567.1	544.4	642.1	21.2%	17.5x	14.8x	
<b>Average</b>										<b>22.0%</b>	<b>18.4x</b>	<b>16.0x</b>	
<b>Pharma Chemicals</b>													
Bayer AG	126.3	106.5	146.3	86%	104,443.5	123,380.5	46,697.0	9,762.0	10,982.7	20.9%	12.6x	11.2x	
Lonza Group Ltd	149.7	83.7	151.1	99%	7,789.1	9,486.5	3,589.6	722.4	784.8	20.1%	13.7x	12.1x	
Novozymes A/S	45.5	33.1	48.8	93%	13,800.2	13,830.4	1,840.3	638.0	684.9	34.7%	21.7x	20.2x	
Merck KGaA	96.9	92.3	97.6	99%	42,108.2	40,869.7	12,517.7	3,323.3	4,379.9	26.5%	12.3x	9.3x	
<b>Average</b>										<b>25.6%</b>	<b>15.1x</b>	<b>13.2x</b>	

Source: Capital IQ as of November 30, 2015

## Upcoming Events

### Q1 2016

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#### Next Event



#### **Informex 2016**

2/2/2016 to 2/4/2016 | New Orleans, USA

<http://www.informex.com/>

Informex offers exhibitors & attendees a direct view of what is happening globally across the fine, specialty & chemical manufacturing marketplace. The event brings together an international mix of motivated buyers, manufacturers, distributors and sellers of high value chemistry for 3 days of sourcing, education & networking.

The 2016 Conference Program will serve to foster dialogue on innovation and commercialization trends, regulatory challenges, market dynamics and opportunities for growth within today's rapidly growing chemical markets including, the broader energy field, pharmaceuticals, life sciences and agrochemicals. Educational sessions will also highlight opportunities in new innovative sub segments such as green chemistry, 3-D printing and electronic chemicals.

#### Events Ticker

##### **7th International Gas Technology Conference**

02/17/2016 to 02/18/2016 | Madinat Jumeriah, Dubai

<https://www.europetro.com/en/igtc2016>

##### **FPSO Europe Congress**

02/24/2016 to 02/25/2016 | London, United Kingdom

<http://www.fpsoeuropecongress.com/>

##### **DCAT Week**

03/14/2016 to 03/17/2016 | New York, USA

<https://www.dcat.org/DCATWeek16.htm>

##### **ChemCon**

03/15/2016 to 03/18/2016 | Amsterdam, Netherlands

[http://www.chemcon.net/upcoming\\_europe.shtml](http://www.chemcon.net/upcoming_europe.shtml)

##### **HIS World Petrochemical Conference**

03/15/2016 to 03/18/2016 | Houston, USA

<https://www.ihs.com/events/wpc-2016/home.html>

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