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DealReader

Chemicals & Materials Q4 2018



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Lincoln extends expertise in Chemicals & Materials with two premier transactions in Q4 2018

A introduction to solvents

Update on Chemicals & Materials public company performance and valuations

Market update on Chemicals & Materials transactions

Project Tango Case Study

Project Tango

Description:

Project Tango (“Tango” or the “Company”) manufactures high-density polyethylene (“HDPE”) recycled plastic lumber used in the outdoor furniture, site amenities and dock decking end-markets. The Company extrudes blended plastic resin pellets and additives into plastic lumber, which is then fabricated by its customers for a diverse set of applications. Tango has a comprehensive product offering including various lengths, widths, colors and finishes. The Company further differentiates itself through innovation (e.g., unique performance attributes) and customer service (e.g., lead times and custom product development).

Key Process Preparation Items:

- Third-party market study to educate buyers on addressable market size, end-market trends and competitive landscape
- Master sales and margin database to facilitate MD&A and trend analysis
- Granular forecast tied to the growth plan

Key Insights from the Transaction:

- Growing popularity of outdoor living as a lifestyle trend is expected to drive outdoor market growth beyond overall residential repair, remodeling and new construction spending
- Alternative materials (i.e., non-wood) are increasing penetration as technology has improved – attractive aesthetics paired with superior durability and lower maintenance
- Channel strategy is critical – acquirers are very focused on which channels will take / lose share in the future
- Acquirers focused on raw material cost uncertainty – even with favorable medium-to-longer term drivers (e.g., increased polyethylene capacity coming online), acquirers were focused on short term raw material pricing volatility

Sell-Side



Gaylord Chemical Company Case Study



has been sold to



Sell-Side



Description:

Gaylord Chemical Company L.L.C. (“Gaylord” or the “Company”) is the superior provider of dimethyl sulfide (DMS) and dimethyl sulfoxide (DMSO) in the Western Hemisphere. The Company offers a full range of high-value product grades, providing for a wide variety of uses across numerous industries, including petrochemicals, agrichemicals, pharmaceuticals and microelectronics. Headquartered in Slidell, Louisiana and operating out of a state-of-the-art production facility in Tuscaloosa, Alabama, Gaylord serves blue-chip customers in over 40 countries. The Company is further differentiated with technical expertise and innovation (e.g., end applications) and customer service.

Key Process Preparation Items:

- Video tour of the manufacturing facility embedded into the marketing materials digitally (i.e., link in confidential information presentation)
- Master sales and margin database to facilitate MD&A and trend analysis
- Granular forecast tied to the growth plan with additional upside opportunities
- Specific presentation for additional upside opportunities not included in the forecast presented in management presentations and sent digitally to potential buyers

Key Insights from the Transaction:

- For businesses that are leaders operating in niche markets, it is important to credibly demonstrate a large total addressable market
 - Acquirers were focused on the total addressable market over the next five years
- Environmentally friendly, safe and non-toxic chemicals can be key considerations for potential acquirers and command higher multiples
- Sustainability and relationships with suppliers of key inputs are critical to providing comfort to buyers
- Clearly articulating and quantifying potential upside growth opportunities optimized value and created competitive tension between potential buyers

A Introduction to Solvents

by Dr. Thomas Schneider (Vice President, Lincoln Frankfurt)

The chemistry of living beings is generally chemistry in solution, a solution which is generally aqueous.

In chemistry, the word “solution” describes a homogeneous mixture of at least two chemical substances, whereby the dissolution is based on a physical process. A solvent is defined as a substance that dissolves other material(s) to form a solution. Common solvents are liquid at room temperature but can also be solid (e.g. ionic solvents) or gaseous (e.g. carbon dioxide). In this context a solvent represents the ingredient of a solution that has the biggest share. Next to the gas, there is the solute which can be a liquid, solid or gas.

Chemical reactions can be performed in a gas, liquid, or solid phase, but, with good reasons, the majority of such transformations is carried out in the liquid phase in solution. On the macroscopic level, a liquid is the ideal medium to transport heat to and from exo- and endothermic reactions. From the molecular-microscopic point of view, solvents break the crystal lattice of solid reactants, dissolve gaseous or liquid reactants, and they may exert a considerable influence on reaction rates and the chemical equilibria.

Whenever a chemist wishes to carry out a particular chemical reaction, he or she has to take into account the right reactants and their concentrations, the right reaction vessel, the appropriate reaction temperature and, where appropriate, the right catalyst, but also, if the planned reaction should be successful and efficient, the decision about the right solvent or solvent mixture. Besides chemical reactions, the proper solvent or solvent mixture is also crucial among others for physical processes such as recrystallization (e.g. purification of active pharmaceutical ingredients), all extraction processes (e.g. flavour and fragrance production), chromatographic separations (e.g. peptide purification) and phase-transfer catalytic reactions (e.g. polyester production).

The number of solvents generally available for research and industrial processes is between 250 and 300. Besides, there is also an infinite number of solvent mixtures. In the last 30 years for obvious reasons, the search for new solvents is a constant topic: toxic solvents are being replaced by nontoxic ones (e.g. hexamethylphosphoramide (HMPA), by N,N-dimethylpropyleneurea, (DMPU)) or environmentally dangerous solvents by benign ones (e.g. tetrachloromethane by perfluorohexane). Even plain water has found a remarkable renaissance as a solvent for organic reactions. Furthermore, new solvent concepts, like ionic liquids (room-temperature liquid salts) or supercritical-fluids perform very well in selected applications.

The solvent needs to possess proper chemical and physical idiosyncrasies to dissolve the specific solute and to guarantee a homogenous mixture. Therefore, solvents need to provide a “comparable” chemical structure to the solute or at least “similar” substructures to ensure sufficient interactions.

The broad range of solvents can be clustered as following:

- Polar, protic solvents contain at least one hydrogen atom directly connected to an electronegative atom (e.g. -OH, -NH). These solvents are able to form hydrogen bonds, dissolve polar substances, solvate cations and anions, and are miscible with water. Common examples are: water, acetic acid and ethanol.
- Dipolar, aprotic solvents contain no hydrogen atoms connected directly to an electronegative atom but have a large dipole moment within the compound. They are not capable to form hydrogen bonds and are able to dissolve polar substances. Common examples are acetonitrile, dimethyl sulfoxide, ethyl acetate or crown ethers.
- Non-polar solvents are characterized by no or at least a low dielectric constant (<5). Non-polar solvents are immiscible with water but possess the capability to dissolve substances such as oils, fats and greases. Common examples are carbon tetrachloride, benzene, toluene and diethyl ether.

Apart from the classification by structure or functionality, it is also possible to categorize solvents by organic and inorganic origins. An inorganic solvent is a solvent that is not an organic compound. Popular representatives are liquid ammonia, liquid sulfur dioxide, sulfuryl chloride and sulfuryl chloride fluoride, antimony trichloride, and hydrogen fluorides. Organic solvents contain an organic moiety and can be classified as aliphatic hydrocarbons, cyclic hydrocarbons, aromatic hydrocarbons, ketones, amines, esters, alcohols, aldehydes, and ethers.

The major raw material source for solvents is crude oil, which is processed by desalting and distillation in the petrochemicals industry to approx. 30-50 fractions, mainly to fuels (approx. 85%), nonfuel products (e.g. asphalt, waxes, lubricants), as well as to a broad range of petrochemical feedstocks like naphtha, ethylene, benzene or xylene. Certain fractions from the distillation of the crude oil are further refined through different operations like thermal cracking, catalytic hydrocracking isomerization, alkylation, nitration or halogenation. Thereby it should be noted that the compounds produced are not only used as solvents, but also as raw materials for the production of a large number of downstream compounds (e.g. toluene over three steps to TDI) and materials (e.g. ethylene polymerized to polyethylene).

The (organic) solvents market is a consolidated market which is dominated by players like BASF, Celanese, China National Petroleum Corporation (CNPC), DowDuPont, ExxonMobil, Honeywell, INEOS, LyondellBasell, Sinopec, and Solvay. Besides the major and global acting players, the market is characterized by various small and mid-size companies, which often focus on selected products, regions and niches. By total consumption, China is the largest market for solvents followed by the United States.

A Introduction to Solvents (Cont'd)

by Dr. Thomas Schneider (Vice President, Lincoln Frankfurt)

Solvents are highly relevant in almost all industries and often critical for success in specific process steps. The following table shows typical solvents and their function/application for selected industries:

Industry	Selected Typical Solvent	Selected Function / Applications	Comments
Coatings, Adhesives and Sealants	Water Methyl ethyl ketone Acetone Toluene Xylene Ethylbenzene Mineral spirits Often mixtures	Solving base polymer/resin Solving ingredients Viscosity regulation Enhance performance	Also a broad range of solvent-free systems are available (e.g. UV curing) No single solvent is capable of dissolving all of the film-forming ingredients used in modern coatings
Electronic Industry	Acetone Acetic acid Butyl acetate Ethyl acetate Methyl n-amyl ketone Chlorobenzene Xylene	Cleaning Drying (wafers) Substrate decomposition or removal	Global ban of the CFCs has fundamentally changed cleaning in the electronic industry Typically high-purity; low trace metal content products
Food Industry	Isohexane Isopropanol Methyl acetate Methanol Acetone Carbon dioxide	Extraction of veg. oils Preparation of defatted protein products Decaffeination of, or removal of irritants and bitterings from coffee and tea	Maximum residue limits in the extracted foodstuff or food ingredient are strictly limited
Pharmaceutical Industry	Dimethylformamide Acetonitrile Dimethyl sulfoxide Chloroform N-Methylpyrrolidone Methanol Almost all organic solvents	Reaction media Extraction medium Crystallisation Purification Part of the final product formulation	Highly purified solvents are required
Textile Industry	Methyl ethyl ketone Toluene Methanol	Printing Finishing Scouring Desizing Coating	The total number of solvents used is low Textile Industry is among the lowest contributors to VOC

According to recent market reports, there are two dominant trends that can be identified:

- Increasing demand and market share in APAC (various sources expect that China will account for approx. 40% of the global chemical market by 2020)
- Increasing regulatory pressure and environmental awareness, especially in China

To participate in the promising outlook BASF for example announced just recently, that they intent to invest approx. Euro 10 bn in a new site with a highly-interated "Verbund" chemicals production to be built in the South Chinese province Guangdong. This would be BASF's largest investment and to be operated under the sole responsibility of BASF. A steam cracker – the heart of the new "Verbund"-site with a planned capacity of 1 million metric tons of ethylene per year – would be the starting point of the value chains at the new site. In the next phases, plants for more consumer-oriented products and solutions – including solvents – would be built to serve sectors like transportation or consumer goods. The finalization of the project is expected in 2030.

Besides green- and brownfield investments various transactions have taken place in the field of solvents in the last 2 years. Remarkable examples here are the acquisition of KMG Chemicals by Cabot Microelectronics, the acquisition of LCY Chemical by KKR or the above-mentioned sale of Gaylord Chemicals to EagleTree Capital.

To tackle the challenge regarding the increasing pressure in regulation and environmental awareness various players spent significant investments and efforts in R&D to strengthen their position in the highly competitive "bio & green" solvents market. But not just the production of green or biodegradable solvents is included in the trend, also new methods for the recycling of solvents is gaining more importance. Therefore, the green chemistry movement defined key challenges for the industry to solve:

- Substitution of hazardous solvents – ones that show better EHS properties
- Substitution of organic solvents either with supercritical fluids that are environmentally harmless or show low vapour pressure, and thus less emissions to air
- Use of "bio-solvents" that are produced with renewable resources (e.g. ethanol out of fermentation)

The class of "green solvents" includes water, supercritical fluids, ionic liquids, non-toxic liquid polymers and their combinations. They are characterized by convenient accessibility, low toxicity, and the possibility of reuse as well as great efficiency.

In summary, it should be concluded that solvents, green or conventional, represent a significant part of the global chemical industry and are critical for the success of countless processes in a wide variety of industries.

Market Intelligence

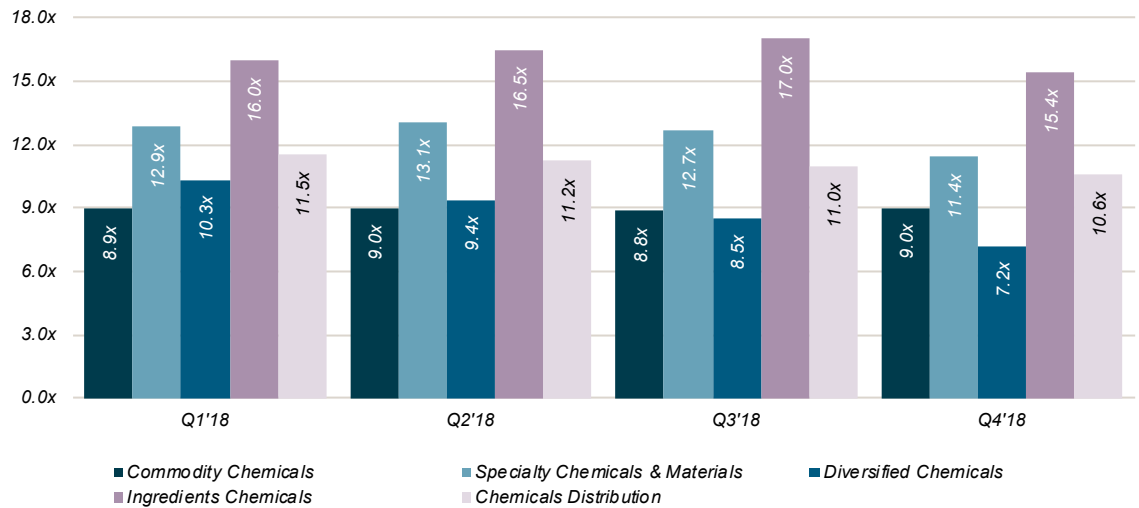
Along with the S&P 500, all of the Lincoln International Chemical & Material indexes declined significantly during Q4, with several of the indexes experiencing an EV / EBITDA multiple decline greater than 1.0x during the quarter. Throughout Q4, Chemical & Materials companies were negatively impacted by macroeconomic issues (e.g., tariff uncertainty, concerns over slowing growth in Asia, interest rate increases) and by rising raw material input costs putting pressure on margins (a factor throughout 2018).

U.S. chemical production ended 2018 on a healthy note. The strongest areas were related to plastic resins, organic chemicals, synthetic rubber, coatings, adhesives, pesticides, other specialty chemicals, consumer products and manufactured fibers. Areas that showed softer production trends were fertilizers, inorganic chemicals, synthetic dyes and pigments. The American Chemistry Council projects U.S. volumes to grow 3.6% in 2019.

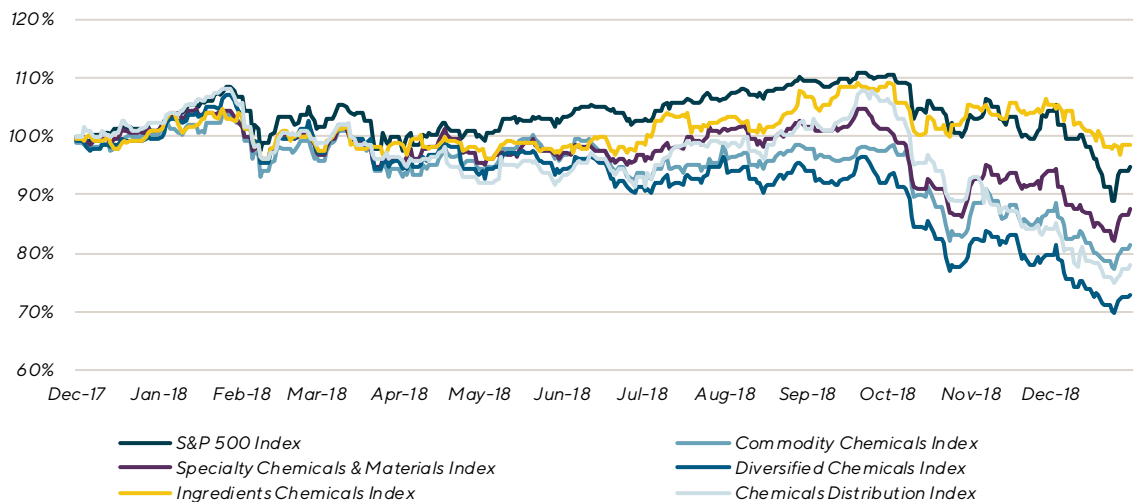
Source: American Chemistry Council

Chemicals & Materials Public Comparables

Historical Enterprise Value / LTM EBITDA



Stock Market Performance



Public Companies Valuation Statistics

Company Sector	Number of Companies	Quarterly Stock Performance	% of 52 Week High	EV / LTM		P / E Multiple	Net Debt / LTM EBITDA	LTM Growth		LTM Margin	
				Revenue	EBITDA			Revenue	EBITDA	Gross	EBITDA
Commodity Chemicals	17	(20.3%)	65.8%	2.07x	9.0x	28.8x	2.7x	10.0%	6.2%	29.4%	20.9%
Specialty Chemicals & Materials	30	(17.3%)	72.7%	1.92x	11.4x	27.1x	2.4x	11.4%	10.4%	33.2%	16.2%
Diversified Chemicals	13	(19.5%)	68.2%	1.96x	7.2x	21.4x	1.9x	16.7%	24.9%	30.4%	17.9%
Ingredients Chemicals	7	(20.6%)	75.7%	4.31x	15.4x	28.0x	2.0x	6.3%	3.8%	40.9%	24.2%
Chemicals Distribution	7	(30.3%)	61.2%	0.67x	10.6x	19.4x	3.0x	2.8%	(6.6%)	16.6%	5.4%
Median				1.96x	10.6x	27.1x	2.4x	10.0%	6.2%	30.4%	17.9%

Source: Capital IQ, ThomsonONE, Wall Street research and company data

Selected M&A Transactions

(\$ in millions)

Closed	Target Company	Acquiring Company	Enterprise Value	EV / LTM	
				Revenue	EBITDA
Announced	Perstorp UK Ltd.	Ingevity Corporation	\$653.5	-	-
Announced	Ningbo Haiyue New Materials Co., Ltd.	Kingfa Sci. & Tech. Co., Ltd.	199.1	0.24x	-
Announced	Whitford Corporation	PPG Industries, Inc.	-	-	-
Announced	BWA Water Additives UK Limited	Italmatch Chemicals S.p.A.	-	-	-
Announced	Patriot Chemicals and Services, LLC	Energy and Environmental Services, Inc.	-	-	-
Announced	Chemical Manufacturing Assets of Oji Fibre	Ixom Operations Pty Ltd	-	-	-
Announced	Saudi Methanol Company	Saudi Basic Industries Corporation	600.0	-	-
Announced	Hengshui Kaiya Chemical Co., Ltd.	Rianlon Corporation	102.3	2.43x	-
Announced	Plasticolor Sweden AB	Nexam Chemical Holding	14.3	1.41x	-
Announced	Neo Performance Materials Inc.	Luxfer Holdings PLC	536.7	1.18x	9.4x
Announced	Materia, Metathesis Catalyst IP	Umicore Precious Metals Chemistry	27.0	-	-
Announced	Jiangsu Lanfeng Bio-chemical Co.,Ltd	Shaanxi Jinhe Investment Fund Partnership (Limited Partnership)	1,304.1	5.29x	-
Dec-18	Brenntag Biosector A/S	Croda International Plc	81.7	-	-
Dec-18	Zhejiang Yongtai Technology Co.,Ltd.	Shanghai Haitong Securities Asset Management Company Ltd	1,068.0	2.48x	16.0x
Dec-18	Pachem Distribution Inc	Brenntag AG	-	-	-
Dec-18	Yingchuang Sanzheng (Yingkou) Fine Chemical	Malion New Materials Co., Ltd.	129.1	-	-
Dec-18	Quimicryl S/A	ParexGroup SA	-	-	-
Dec-18	SEM Products, Inc.	PPG Industries, Inc.	-	-	-
Dec-18	Praxair Deutschland Holding GmbH & Co.	Shanghai Haitong Securities	5,748.2	3.86x	12.3x
Nov-18	Tangent Technologies, LLC	The Sterling Group, L.P.	-	-	-
Nov-18	COMPO Expert GmbH	Grupa Azoty S.A.	255.9	-	-
Nov-18	KMG Chemicals, Inc.	Cabot Microelectronics Corporation	1,606.5	3.45x	13.5x
Nov-18	COFCO Biochemical Holdings Limited	COFCO Biochemical (Anhui) Co., Ltd.	721.2	0.64x	-
Nov-18	Senomyx, Inc.	Firmenich Incorporated	59.2	2.24x	-
Nov-18	Evonik Jayhawk Fine Chemicals Corporation	Permira Advisers Ltd.	-	-	-
Nov-18	Colourland Paints Sdn Bhd	Akzo Nobel N.V.	-	-	-
Oct-18	Linde Aktiengesellschaft	Praxair, Inc. (nka:Linde plc)	42,562.7	2.31x	10.3x
Oct-18	FAR Research Inc.	Cyalume Technologies Holdings, Inc.	-	-	-
Oct-18	The SoCo Group, Inc.	Southern Counties Oil Company	-	-	-
Oct-18	Mondo Minerals B.V.	Elementis plc	553.0	3.91x	15.4x
Oct-18	Polytek Development Corp.	Arsenal Capital Partners	-	-	-
Oct-18	Gaylord Chemical Company, LLC	EagleTree Capital L.P.	-	-	-
Oct-18	SI Group, Inc.	Addivant USA, LLC	-	-	-
Oct-18	Frutarom Industries Ltd.	International Flavors & Fragrances Inc.	7,079.6	4.90x	24.6x
Oct-18	Pacer Technology Inc.	Grupo AC Marca sl	23.1	-	-
Oct-18	Specialty Chemicals Business of Akzo Nobel	The Carlyle Group	12,524.8	-	-

Source: Capital IQ, Mergermarket, Pitchbook and company data



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