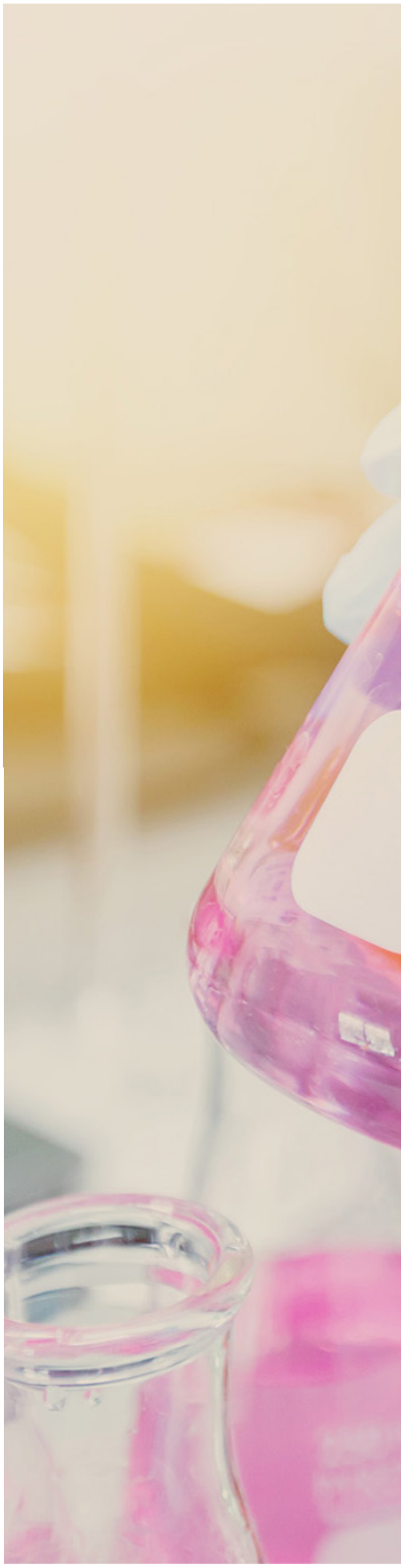
Quarterly Review

Chemicals & Materials Q4 2019



Inside This Issue

LINCOLN INTERNATIONAL

Coatings, UV Curing and Schmid Rhyner

by Dr. Thomas Schneider, Director and Head of Chemicals Germany

Coatings – A Condensed Overview

Coatings are everywhere! They affect our lives to an extent that we are often unaware of. Their added value can hardly be quantified and measured.

Coatings provide two primary functions – decoration and protection that are of considerable economic importance. Without coatings product lives might be shortened drastically, and many would not even be marketable. For example, coatings protect our ships and containers from rust and deposits, along with extending the lifetime of our buildings and infrastructure. Additional examples including coatings improving the appearance of packaged food or making automotive equipment scratch resistant. Even our iPhone's have a fingerprint-resistant oleophobic coating, which make the device oil repellent. However, coatings are not a human invention, but as so often, humans let themselves be inspired by nature.

Plants cannot actively clean themselves, but some such as the Indian Lotus flower (Nelumbo nucifera) use a coating of microscopically small dots of wax arranged in a regular pattern to keep the surface of their leaves free of dirt and microorganisms that could cause diseases (lotus effect). Also fruits, such as apples and plums, produce their own wax based coating system to prevent moisture loss, enhance the fruit firmness and slow down degradation. Even our skin is protected by a complex coating system (acid mantle).

In 2018, the global production of coatings was ~55 million metric tons, valued around USD $150 billion, whereby the coatings production in Asia accounts for around half of that. In Western Europe, United States and Japan, the coatings industry is mature and correlates directly with the economic activity, especially in construction, housing and transportation. This leads to growth being highly related to the developing world. For example, per capita coatings consumption is only around 4 kilograms in India, compared to 19 kilograms in the United States. In China, production grew by ~11% annually in the last decade, but it is expected to "slow" to 5-6% for 2018-2023. Per capita consumption has risen quickly in China, to around 12 kilograms. To participate in this growth, 100+ foreign companies, including almost all major multinationals (e.g., Akzo Nobel, BASF, Kansai Paint, Nippon Paint, PPG, Sherwin-Williams) have made sizeable investments or set up local production centers, primarily by M&A or forming JVs with local players in Asia rather than centralizing productions. This is also due to international trade in the coatings industry being limited to relatively small quantities of high-value technical coatings.

The coatings market can be segmented in architectural (c. 55 by volume and c. 43% value) and industrial coatings. The latter includes market segments like wood, automotive OEM & commercial vehicles, marine, coil and others. The industry structure is characterized by many coatings manufacturers, but most are (local) small to mid-sized producers, with only around 10 multinational players. The mid-sized coatings providers are often highly focused on selected niches, such as coatings for specific automotive interior and exterior or solutions for packaging materials like Schmid Rhyner (please see page 5). They typically act with high flexibility and provide customers with highly customized coating formulations with technology supported by various technical and development services.

Sources: CoatingsWorld, Coatings Association(s), PCI Magazine, IHS Markit, Lincoln International

Coatings – A Condensed Overview (cont'd)

The most noteworthy industry trend over the last decade has been consolidation, especially among the larger players. In mid-2017, Sherwin-Williams (third largest coating provider in the world 2016) completed the acquisition of Valspar (#5), to become the second largest global producer. Other attempts at consolidation continue, as an example the US strategic PPG (#1) tried to acquire Akzo Nobel (#3) in 2017. In addition to these "mega deals", the industry structure is constantly changing due to various mid-market M&A transactions in which the major players acquire " the specialist" (often family owned). A good example is the acquisition of the German automotive coatings producer Hemmelrath by PPG in mid-2019. Behind these transactions, which generally take place with multiples well over 10x EBITDA, are often the following rationales:

- Complementation of product portfolio – create solutions / packages (e.g. primer + base coat + clear coat)
- Gain access to new customer groups or increase share of wallet with key customers
- Gain access to innovative products / technologies, know-how and operational capabilities to enhance competitiveness
- Regional expansion especially in Asia which is driven by globalization of customers
- High operational synergy potential (overhead costs, buying power, etc.)

Besides the ongoing consolidation it is worthwhile to mention that plant sizes have been increasing significantly in the past few years through sizable capital expenditure. In 2017, Akzo Nobel increased its capacity for coatings at their site in Ashington, England, by investing more than Euro 100 million. The factory is now capable of doubling AkzoNobel's current UK production levels to 200 million liters a year, approximately enough decorative paint to redecorate every living room, bathroom and kitchen in the UK.

In general, a coating is an application specific formulation, which consist of film formers, pigments, solvents and additives (exceptions are powder and UV curing coatings). Film formers or so-called binders are mostly (around 95%) non-volatile synthetic resins or rather oligomers and polymers (e.g., alkyds, vinyls, urethanes, polyesters, epoxies) that form the final coating. Important producers of coating resins includes Allnex, Arkema, Eastman, DIC and Dow Chemical. Pigments include ground, insoluble, dispensed inorganic or organic particles that are incorporated into a coating formulation to provide color and opacity. However, they also can act as fillers, reinforcements and property modifiers to influence corrosion resistance (e.g. zinc powder), durability and mildew control. As a volatile component of the coating formulation, with the primary function to dissolve or dispense the film-forming constitutes, either organic solvents (solvent-based coatings) or water (water-based coatings) are used. Besides, the solvent also reduces the viscosity of the formulation for easier handling and application and modifies the drying time, setting rate, flow properties and flammability. Additives account for no more than a few percent of the formulation, but act as a key component to facilitate the production, application and performance properties of coatings. Important types of coating additives with a diverse chemistry are for example: plasticizers, emulsifiers, wetting agents, thickeners, dryers, anti-skinning agents, antifoaming agents, corrosion inhibitors and UV absorbers. Providers of coatings additives are Clariant, Evonik, Milliken (Borchers) and Lubrizol. The manufacturing of conventional coatings is a relatively simple and not capital. The formulation process, without chemical reactions, includes the following operations: mixing, dispensing, adjusting, and filling.

It is not surprising that the coatings industry consumes a greater number and variety of chemicals and intermediates as raw materials, estimated 600 different chemical substances, than any other segment of the chemical industry. Thereby the non-petrochemical portion of feedstocks is approximately one-third, on a volume basis. Generally, raw material prices have stayed relatively stable in recent years after some upheavals in the early 2010s, but significant price increases have been limited to some resins types (e.g., silicones, epoxies) during 2017-2018. There have also been some supply disruptions of some low-volume raw materials, especially sourced from China due to environmental restrictions imposed by governmental authorities. Raw material costs account typically for 40-60% of the cost of making coatings.

In general, the technology of coatings is mature. Most of the developments and innovations are focused on refinements in raw materials, often to make them compatible in new, more environmentally friendly (e.g. water-based) formulations. Current selected fields of R&D in the coatings world, many of them targeting "smart coatings ", are as follows:

- Coatings applied to plastic that can be detected to facilitate recycling or stripping
- Coatings that protect product identities
- Sensor coatings with antenna function
- Coatings that change color via an appropriate stimulus
- Coatings with photovoltaic activity
- Coatings that capture airborne pollutants (e.g., formaldehyde)

Sources: CoatingsWorld, Coatings Association(s), PCI Magazine, IHS Markit, Lincoln International

Coatings – A Condensed Overview (cont'd)

In the last 20 years, the coatings industry like other chemical segments has researched the use of bio-renewable raw materials, usually a derivative from fermentation, sugars or grains, especially for use in resins / binder synthesis. The reasons to continue efforts to develop products with greater sustainability can be summarized as follows:

- Increased availability of bio-based feedstocks, mainly in Asia
- Fluctuating cost and availability of petrochemical-based feedstocks
- Increasing customer demand (however, products based on bio-renewable raw materials are often not competitive due to their high price)
- Novel properties that new raw materials might impact (polyesters, acrylics and other coating resins)
- Possible reduction in VOCs and hazardous wastes
- Green initiative programs
- Reduction of greenhouse gas emissions

The coating industry is one of the most heavily regulated industries in the world. For example, during the last 40 years producers have been forced to adopt low-solvent and solventless technologies that could reduce the emissions of volatile organic compounds (VOCs) and hazardous materials (e.g., NMP solvents and APEO (alkylphenol exthoxylates). These innovative technologies include waterborne coatings, high solid coatings, two-component systems, powder coatings and radiation-curable coatings (e.g., UV curing). In 2018, around 40% of world consumption were conventional solvent born coatings, 34% waterborne emulsions for architectural application, 10% waterborne systems for industrial use, 8% solids, 5% powder as well as 3% radiation and other. In the following, we will take a closer look at UV curing technology.

UV Curing

Radiation curable coatings are cured / hardened using ultraviolet light (UV) or electron beam (EB) as energy sources instead of conventional heat. In contrast to conventional systems, UV curing coatings usually consist of acrylate functionalized oligomers, acrylic monomers (e.g., trimethylolpropantriacrylat, TMPTA) and photoinitiators (e.g., 2-hydroxy-4'-(2-hydroxyethoxy)-2-methylpropiophenone, Photoinitiator 2959). UV curing formulations are typically 100% systems without solvents. When irradiated with UV light, the molecules of the photoinitiator form free radicals, which initiate the polymerization or rather the film forming process of the oligomer and monomer (cure occurs via direct polymerization rather than by evaporation of the solvent). A key advantage of acrylate-based UV cured coatings is the availability of an extensive number of oligomers, often containing epoxy or urethane groups, that can be used in combination with different diluting acrylate monomers to meet a wide range of cured film properties. Key supplier of raw material for UV curing coatings are IGM Resins (photoinitiators), DSM, Allnex (both resins) and Eternal (monomers).

The market for UV curing technology has been growing up to double-digit rates in the last decade. The main reason for the rapid technological growth of UV curing, originally introduced in the 1960's, is its unique process characteristics, which allows the application of UV curing coatings on virtually any substrates, including plastic, metal, composite, wood, paper, leather, vinyl, glass and even human teeth. The original driving forces behind the commercialization of UV-technology were energy saving and freedom from solvents. These benefits are complemented by high productivity and subsequently higher profits that can be achieved with the increased line speed, just-in-time benefits and immediate "pack and ship" capabilities.

Almost all major coatings players today offer UV curing coatings for various applications. For example, PPG offers with its Raycron® products UV curing solution for flooring industries (parquet, PVC, cork, linoleum, etc.), consumer products (mobile phones, laptops, etc.), as well as for the steel pipes industry.

Sources: CoatingsWorld, Coatings Association(s), PCI Magazine, IHS Markit, Lincoln International

Lincoln International Transaction: Conzzeta Sells Schmid Rhyner to Altana

Schmid Rhyner AG (the "Company"), a subsidiary of the Swiss listed Conzzeta AG, headquartered in Adliswil, Switzerland, is the global innovation leader in high-performance (low migration) UV curing and specialty water-based coatings primarily for the packaging industry. The Company serves more than 1,600 customers and is recognized for product quality and its innovation and development capabilities. The product offering includes UV curing and water-based overprint varnishes, laminating adhesives, varnishes with tactile effects like wettouch or sandtouch (Touch & Feel), as well as silver coatings and solutions for digital varnishing.

Several of Schmid Rhyner's product innovations launched in the last 15 years had a disruptive impact in the market; product launches generally target prevailing trends and needs in the packaging industry. For example, the touching and feeling of products and its packaging play an increasingly decisive role in the purchasing decisions of consumers. For instance, in tobacco, tactile effects of packaging have become crucial differentiators due to limited advertising possibilities. Therefore, Schmid Rhyner offers a comprehensive product assortment of UV and specialized water-based "Touch & Feel" coatings, which give print products a beautiful surface finish and unique tactile effects. These lure consumers closer, inviting them to touch, whereby every coating generates a different stimuli. Effects of Schmid Rhyner's products include among others softtouch, wettouch, relief sand-/papertouch, 3D, microstructures, and lenticular. Wet touch, for example, provides a fresh look and feels similar to condensed water on leaves or cold drinks. Another interesting innovative product of Schmid Rhyner is called "UV Silver Polar", which allows the generation of metallized surfaces without hot- or cold-foil stamping and enables the replacement of transmet laminated boards with cost savings.

Lincoln International acted as the exclusive financial advisor to Conzzeta, managing a highly competitive M&A process focused on strategic acquires, including an Asian road show, with strong interest from various parties. The German specialty chemicals company Altana arose as the final acquirer. Financial details of the transaction have not been disclosed.

The acquisition rationales defined for Altana at the beginning of the process are as follows:

- Combine sales force to'realize large top-line synergy potential
- Strengthen innovation capabilities, know-how and IP in UV curing (e.g. digital varnishing, low migration)
- Complement product offering with a comprehensive portfolio of UV curing, specialty water-based and hybrid printing finishing solutions
- Gain access to modular production know-how in order to produce high quality UV varnishes in emerging markets
- Gain UV production capabilities and development know-how in oligomers and low migration photoinitiators

The key success factors of this transaction can be summarized as follows:

- Extensive preparation including among others detailed positioning as innovation leader and normalization of raw material increases
- Management of a highly competitive process with no "bad" surprises and strict deadlines
- Close collaboration with Schmid Rhyner's Management Conzzeta and Lincoln International's Global Chemicals Group

Market Intelligence

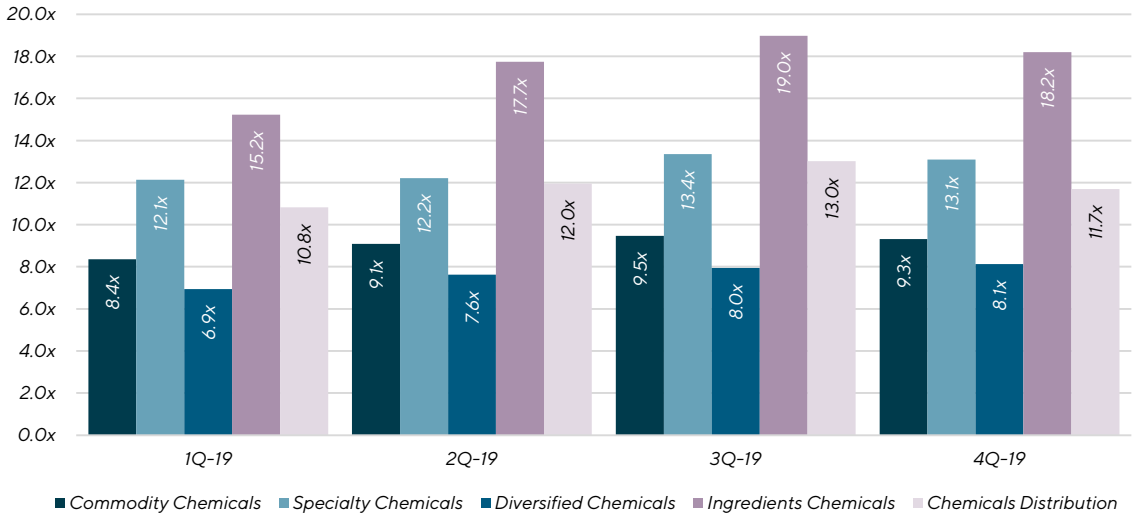
During Q4 2019, the Lincoln International chemicals & materials indexes and S&P 500 remained relatively in line with the prior quarter and prior year. Trends in construction-related resins, pigments and related performance chemicals were mixed for the quarter, suggesting slow gains in housing. The most positive areas for the quarter were organic chemicals, bulk petrochemicals and organics, plastic resins, coatings and other specialties. Compared to a year ago, growth was strongest in manufactured fibers, synthetic rubber, plastic resins, other specialty chemicals and coatings. Additionally, during the quarter, performance chemistry eased, likely signaling weakness among industrial end-use markets.

Q4 2019 global chemical production was mixed from a year ago, with North America, Former Soviet Union and Asia-Pacific showing growth. Weakness was experienced in Latin America and Europe. From a global segment perspective, areas of growth when compared to a year ago were inorganic chemicals, organic chemicals, plastic resins, synthetic rubber, manufactured fibers, coasting and other specialty chemicals. Segment areas that showed weakness were agricultural chemicals and consumer products.

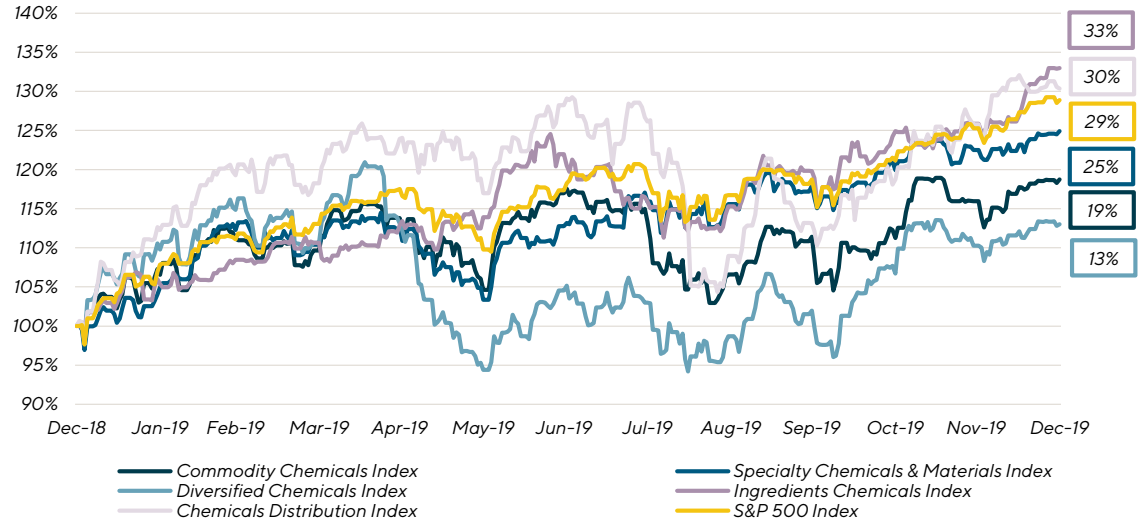
Sources: American Chemistry Council, CapitalIQ, Lincoln International

Chemicals & Materials Market Update

Enterprise Value / LTM EBITDA



Stock Market Performance



Public Company Valuation Statistics (12/31/2019)

Sector	Number of Companies	Quarterly Stock Performance	% of 52 Week High	EV / CY19E Revenue	EV / CY19E EBITDA	P / E Multiple	Net Debt / CY19E EBITDA	CY19E Growth Revenue	CY19E Growth EBITDA	CY19E Margin Gross	CY19E Margin EBITDA
Commodity Chemicals	16	7.7%	79.7%	1.93x	12.5x	22.2x	2.3x	3.5%	9.2%	15.6%	16.0%
Specialty Chemicals	33	11.6%	94.3%	2.39x	14.3x	18.1x	1.9x	(1.4%)	6.4%	29.0%	16.7%
Diversified Chemicals	13	8.3%	88.5%	1.57x	10.4x	13.6x	2.0x	(2.5%)	(2.7%)	25.1%	14.5%
Ingredients Chemicals	6	3.8%	91.6%	4.38x	20.7x	27.2x	2.8x	3.1%	10.4%	36.6%	19.5%
Chemicals Distribution	4	14.6%	95.0%	1.09x	14.3x	16.4x	2.9x	8.5%	17.7%	22.8%	6.8%
Median				**1.93x**	**14.3x**	**18.1x**	**2.3x**	**3.1%**	**9.2%**	**25.1%**	**16.0%**

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

Select Q4 2019 M&A Transactions

($ in millions)

Closed	Target Company	Acquiring Company	Enterprise Value	EV / LTM Revenue	EV / LTM EBITDA
Announced	Jiangsu Jinma Oil Technology Development Co.	Zanyu Technology Group Co., Ltd.	$26	0.70x	-
Announced	Nutrition & Biosciences business of DuPont	International Flavors & Fragrances Inc.	26,200	-	-
Announced	Schmid Rhyner AG	ACTEGA GmbH	-	-	-
Announced	Hubei Weidun Biotechnology	Zanyu Technology Group Co., Ltd.	19	0.29x	-
Announced	Jiangxi Sanshi Nonferrous Metals Co., Ltd.	Jiangxi Henghe Investment Co.	4	-	-
Announced	Panjin Jinyang Chemical Co., Ltd.	North Huajin Chemical Industries Co.,Ltd	25	0.32x	-
Announced	Icynene-Lapolla	Huntsman Corporation	350	1.52x	-
Announced	Tile Coatings Business of Ferro Corporation	Pigments Spain Sl	492	0.96x	-
Announced	Hitachi Chemical Company, Ltd.	Showa Denko K.K.	9,137	1.53x	12.7x
Announced	Shandong Focuschem Biotech Co., Ltd.	Lushang Health Industry Development	61	3.69x	-
Announced	Ellison Surface Technologies, Inc	Bodycote plc	200	4.00x	-
Announced	Masterbatch Business of Clariant Chemicals	PolyOne Polymers India Private Limited	60	1.51x	-
Announced	Caldic Chemie B.V.	First State Investments International	-	-	-
Announced	The Chemours plant	Belle Chemical LLC	-	-	-
Announced	Cangzhou Lingang Yanuo Chemical Co., Ltd.	Hainan Yatai Industrial Development Co.	85	3.15x	-
Announced	Shanghai Dibai Plant Protection Co., Ltd.	ADAMA Ltd.	106	1.38x	-
Announced	Shenzhen Dongchuang Precision Technology Co.	Shenzhen Cotran New Material Co.,Ltd.	81	2.09x	-
Announced	Functional Polyolefins Business of Arkema	SK Global Chemical Co., Ltd.	369	1.34x	-
Announced	U-Best Vietnam Polymer Industry	Evermore Chemical Industry Co., Ltd.	9	2.42x	-
Dec-19	Four herbicide brands	American Vanguard Corporation	-	-	-
Dec-19	Sichuan Xinda New Energy Technology Co., Ltd.	Beijing Sanju Environmental Protection	2	1.31x	-
Dec-19	Société Internationale de Plantations d'Hévéas	Compagnie Financière Michelin SCmA	660	1.95x	20.4x
Dec-19	HeBei Jinniu Chemical Industry Co.,Ltd	Jizhong Energy Fengfeng Group Co.,Ltd	491	3.71x	24.6x
Dec-19	Aerospheres UK Ltd.	Aircraft Fasteners International, LLC	-	-	-
Dec-19	Ergis S.A.	Finergis Investments Limited	79	0.39x	6.5x
Dec-19	Kester Inc.	Alpha Assembly Solutions, Inc.	68	-	-
Dec-19	Koninklijke CSK Food Enrichment C.V.	Koninklijke DSM N.V.	166	2.31x	-
Nov-19	CirComp GmbH	Albany International Corp.	43	-	-
Nov-19	Unicell Poland sp. z o.o.	Flügger group A/S	21	1.00x	7.3x
Nov-19	Shanghai Phichem Material Co., Ltd.	Shanghai Phichem Material Co.	971	4.71x	20.8x
Nov-19	Nan Pao Resins Chemical Co., Ltd.	Yue Dean Technology Corporation	603	1.09x	9.9x
Nov-19	Chifeng Ruiyang Chemical Co., Ltd.	Shanghai Zhongyida Co., Ltd.	107	0.66x	-
Nov-19	gabo Systemtechnik GmbH	HellermannTyton Corporation	310	3.10x	-
Nov-19	Genesys Holdings Limited	H2O Innovation Inc.	22	2.82x	-
Oct-19	Cleansorb Ltd	Newpark Resources, Inc.	19	-	-
Oct-19	Performance Products Business of PolyOne	SK Capital Partners	775	1.11x	-
Oct-19	Maruki Sangyo K.K.	CITIC Capital Partners	-	-	-

Source: Capital IQ, Mergermarket, Pitchbook and company data

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