

CHEMICALS & MATERIALS

Quarterly Review



Q4 2023



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LINCOLN INTERNATIONAL STATEMENT

The organometallics market continues to see a high degree of mergers and acquisitions (M&A) activity. Sitting at the cross section of high-value applications, including primary applications in the active pharmaceutical ingredients space and a high degree of specialty manufacturing and process knowledge, there is a strong degree of interest in the space. While a more volatile chemistry than many others within the chemicals & materials landscape, the differentiated performance and frequently resulting high margins provides an avenue for investors with a focus on managing safety and with a degree of comfort in chemical synthesis. While there are several large players, there is no one player with a dominant share of the market, and the difference across organometallics allows for smaller players to carve out true niches in terms of product differentiation. As previously discussed in greater detail in the specialty chemicals piece back in Q3 2022, there are “logical” exits for this sub-segment of chemicals with major strategists who are looking to tell a differentiated, more specialty story to the market. We expect there to be multiple opportunities in the middle market over the next 24 months, which could provide opportunities for further investment.

Organometallics

by Lincoln International's global chemicals & materials team

Organometallics are utilized as an important catalyst in a wide variety of applications. As a general case, they serve to accelerate the rate of a chemical reaction. Primary end markets include chemicals, electronics, industrials, medicals and pharmaceuticals.

Organometallics will have one or more metal (or semi-metal) atoms bonded with one or more carbon atoms. It is this base chemistry, which helps to provide their catalytic properties and serves as a critical tool in the formation of carbon-carbon bonds. Organometallics can cover a range of states from opaque solids to clear liquids and, depending on the compound, can react explosively with water or combust when exposed to air.

In further understanding the different types of organometallics it is helpful to briefly revisit the four principal groupings or blocks on the periodic table of elements (s – sharp, p – principal, d – diffuse, and f – fundamental). The organometallic compounds can be thought of between main-group compounds and transition metal compounds. The main-group compounds are found in the s-block elements (i.e., alkali metals, alkaline earths, and helium) and p-block elements. The p-block contains elements where the valence electrons are in the p orbital, which consists of the elements in the period table that have between one to six valence electrons. The p-block is the only block on the periodic table that contains metals, non-metals, as well as metalloids. The transition metal compounds cover the d-block and f-block elements. The d-block elements are defined by their d-electron configuration, which contributes to their reactivity. The f-block elements are the inner transition metals covering lanthanides and actinides, which typically have high melting points and variable oxidation states. The electron configuration is the arrangement of electrons in the orbitals of metals and influences the chemical behavior of elements.

When it comes to organometallic production, safety is of the utmost importance due to their highly reactive nature. It is common for operation workers to wear full-body, fireproof suits and other protective gear when handling organometallics. Process knowledge management systems are critical in this field and safety guardrails need to be clearly documented. It is unsurprising then that they are heavily regulated by the U.S. Department of Transportation and the Environmental Protection Agency (EPA). Proactive adoption, even when not explicitly covered of OSHA's Process Safety Management Standards and the EPA's Risk Management Program, is highly encouraged. The manufacturing of each different type of organometallic should be closely monitored due to differences in the speed of their reactions. Transportation for certain organometallics must be done under a dry nitrogen or argon blanket.

Simply put, organometallics are critical to the production of modern pharmaceuticals. The reliability and predictability of the utilization of organometallics in pharmaceutical chemistry have been instrumental in the development of new medicines. They also play an important role in the efficiency and timeliness of major chemical production, including the synthesis of polymers. For agriculture applications, they can be utilized to treat seeds and prevent infection. There are also applications for reversible H₂ storage, supporting green initiatives. When considering growth paths, it is important to note that in the field of chemistry for pharmaceutical applications, the applications are relatively new, and formal recognition coalesced around the same time the 2001 Nobel Prize in Chemistry was awarded for asymmetric catalysis in organic synthesis. For fans of trivia, William Knowles received a quarter share of the Nobel Prize that year, while much earlier in his career helping to pioneer metal catalysis for industrial-sized applications while at Monsanto.

Organometallics (continued)

Players in the organometallics market include Alfa Aesar (Thermo Fisher), Albemarle, Boulder Scientific, FMC, Mitsui Chemicals, Nouryon, Sumitomo Chemical, and WeylChem. The market landscape continues to evolve. For example, as Albemarle continues its transition to being a lithium-focused solutions provider, there is likely to be continued portfolio assessment as far as its re-branded Performance Catalyst Solutions segment “Ketjen” is concerned.

 Alfa Aesar

 Albemarle

 Boulder Scientific Company™
INNOVATIVE SPECIALTY CHEMICAL SOLUTIONS

 FMC

 Mitsui Chemicals

 Nouryon

 SUMITOMO CHEMICAL

 WEYL CHEM

Market Update

Expectations were low heading into the final three months of the year as stubbornly high interest rates caused a late summer downturn in the S&P 500. Despite a continued decline in market sentiment through October, the U.S. economy proved resilient, a recurring theme throughout the year. Encouraging third-quarter economic indicators, coupled with an outperformance in corporate earnings, shifted market dynamics. As inflationary pressures eased faster than anticipated and the Federal Reserve took a neutral stance, a swift reversal in investor sentiment occurred. Both stock prices and long-term interest rates changed course, catalyzing one of the strongest market rallies in recent years. Supported by a healthy job market and rising wages, consumer spending acted as a pivotal driver of the economic expansion, maintaining strong momentum throughout the year. Gross domestic product (GDP) expanded at an annualized rate of 3.3% during the final quarter of 2023. Lincoln's Chemicals Index was up 17% in 2023, while the S&P 500 closed out 2023 up by more than 24%, including up over 11% in Q4.

Chemical producers continue to face a challenging economic and regulatory environment, but closed the year on an upswing, both globally and domestically. The Global Chemical Production Regional Index (CPRI) trended higher by 0.1% in December, following a revised 0.5% gain in November. In the U.S., CPRI rose 0.4% in December, following a 0.3% decline in November. Energy, raw material and transportation costs fell in Q4, while labor costs increased every quarter of 2023. Regulatory scrutiny is weighing on chemical producers, as 44% faced increased regulatory burdens in Q4, and 55% are expecting further increases in the next six months. Chemical producer prices ended the year on a weak note, down by 0.7% in December, the eighth consecutive month of decline. Prices were lower for bulk petrochemicals and organics, plastic resins, synthetic rubber, manufactured fibers and coatings. Despite negative economic sentiment in Q4, chemical manufacturers are optimistic about improvement in the next six months, anticipating a recovery in demand and increased activity levels in the short term.

Positioned upstream within the supply chain, the chemicals sector is expected to witness a rebound in activity ahead of broader improvements in underlying macroeconomic conditions. With over 85% of basic and specialty chemicals consumed by the industrial sector, strong fundamentals driving long-term growth in the sector, particularly in aerospace, energy and electronics, will continue to depend on the chemicals sector for critical innovations and inputs.

Positioned upstream within the supply chain, the chemicals sector is expected to witness a rebound in activity ahead of broader improvements in underlying macroeconomic conditions.

Sources: American Chemistry Council, American Chemistry Council 2, MarketWatch

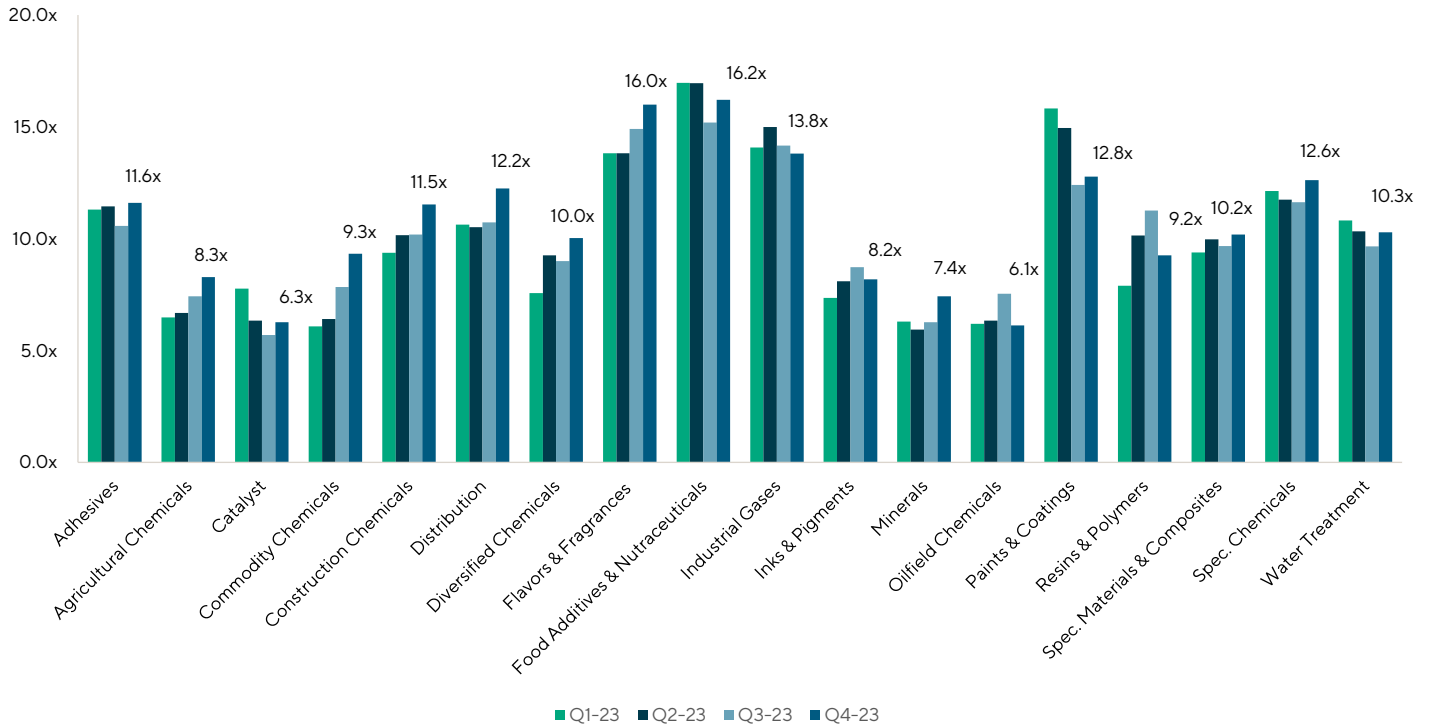
PUBLIC COMPANY VALUATION STATISTICS AS OF 12/31/2023

Sector	Number of Companies	Quarterly Stock Performance	% of 52 Week High	EV / LTM		P / E Multiple	Net Debt / LTM EBITDA	Q4 2023 LTM Growth		Q4 2023 LTM Margin	
				Revenue	EBITDA			Revenue	EBITDA	Gross	EBITDA
Adhesives	4	14.7%	93.3%	1.91x	11.6x	29.0x	1.2x	3.6%	8.7%	35.9%	5.4%
Agricultural Chemicals	14	(2.2%)	73.9%	1.61x	8.3x	14.7x	2.0x	7.0%	12.8%	27.0%	20.1%
Catalyst	3	3.2%	62.9%	0.86x	6.3x	11.7x	1.4x	(0.6%)	(7.8%)	14.4%	11.7%
Commodity Chemicals	13	9.1%	89.1%	1.25x	9.3x	13.7x	3.2x	3.5%	13.1%	20.9%	13.8%
Construction Chemicals	11	17.2%	95.7%	2.07x	11.5x	16.7x	2.2x	3.4%	5.2%	31.0%	16.4%
Distribution	5	20.0%	91.8%	1.41x	12.2x	21.7x	2.5x	4.0%	4.2%	21.0%	10.1%
Diversified Chemicals	16	4.8%	77.0%	1.17x	10.0x	21.4x	1.4x	6.2%	20.0%	22.0%	12.1%
Flavors & Fragrances	9	11.6%	85.3%	2.83x	16.0x	24.4x	0.5x	3.5%	9.4%	40.1%	16.4%
Food Additives & Nutraceuticals	4	5.9%	77.0%	4.36x	16.2x	27.7x	1.8x	3.5%	4.2%	43.8%	24.2%
Industrial Gases	6	6.5%	90.0%	3.93x	13.8x	24.4x	1.9x	10.6%	11.7%	38.4%	25.1%
Inks & Pigments	5	11.8%	93.3%	0.63x	8.2x	14.0x	1.5x	3.6%	20.6%	18.1%	7.4%
Minerals	8	(0.5%)	61.6%	1.58x	7.4x	8.2x	2.4x	(0.6%)	7.3%	29.2%	28.0%
Oilfield Chemicals	4	(14.8%)	78.3%	1.05x	6.1x	17.8x	1.3x	3.5%	7.7%	24.8%	13.5%
Paints & Coatings	8	19.3%	95.8%	2.91x	12.8x	23.4x	1.6x	4.0%	6.9%	37.2%	15.1%
Resins & Polymers	9	(0.0%)	76.5%	1.09x	9.2x	12.7x	5.8x	6.3%	36.9%	15.4%	9.3%
Spec. Materials & Composites	8	7.0%	85.6%	1.60x	10.2x	24.8x	2.7x	5.7%	13.5%	23.8%	13.3%
Spec. Chemicals	10	9.9%	81.7%	2.36x	12.6x	23.0x	2.1x	6.2%	14.6%	30.4%	17.4%
Water Treatment	4	14.2%	93.2%	1.98x	10.3x	19.2x	2.0x	2.0%	2.3%	27.0%	17.3%
Mean		7.3%	82.5%	1.82x	10.4x	18.7x	2.2x	4.6%	12.2%	27.0%	15.5%

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

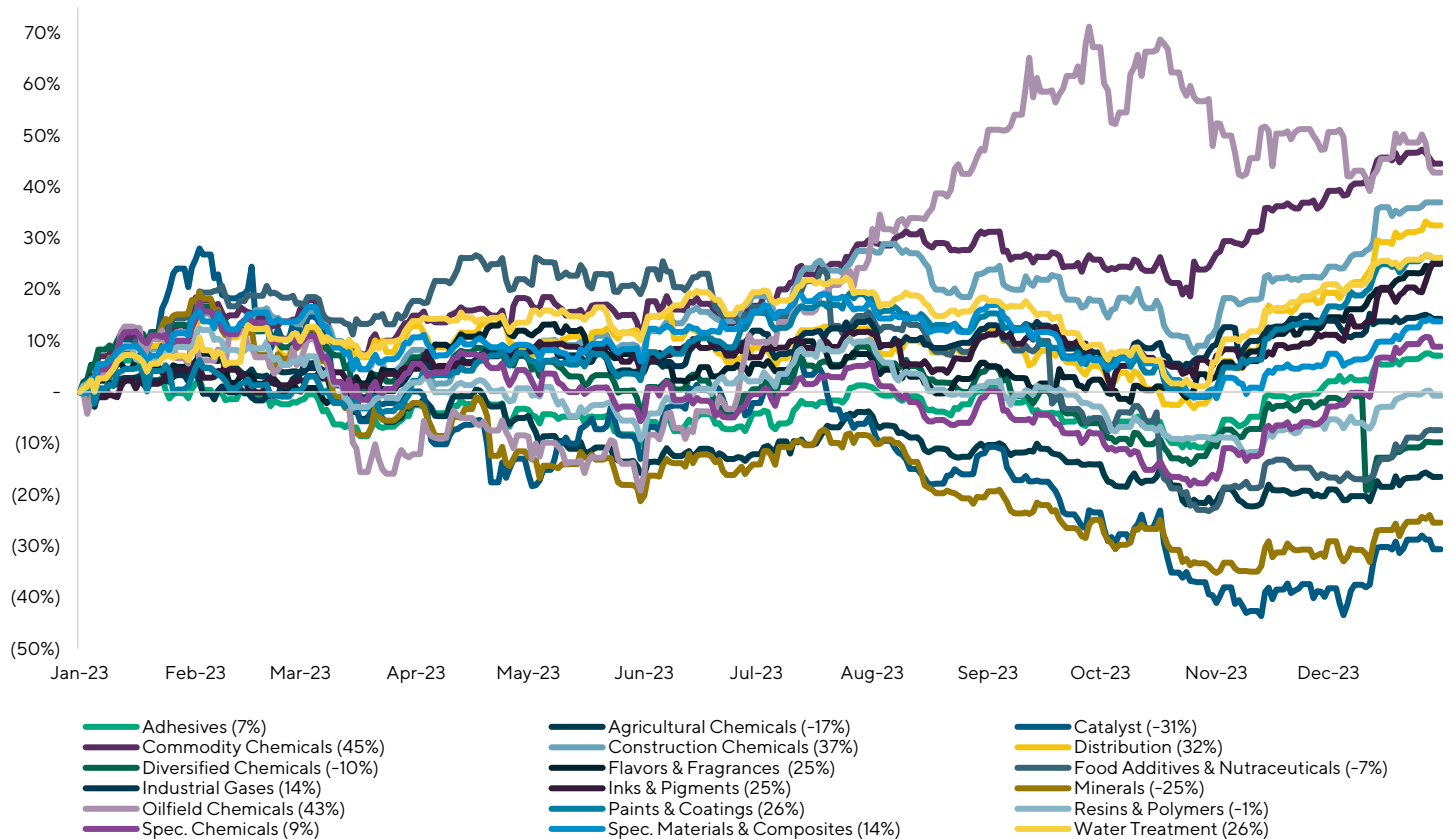
Chemicals & Materials Market Update

ENTERPRISE VALUE / LTM EBITDA



Note: The above multiples are based on the mean for the past four quarters for each corresponding sub-sector

1-YEAR STOCK PERFORMANCE BY CHEMICALS SUB-SECTOR



Note: Calculated based on an average of publicly traded companies in the sector

SELECT Q4 2023 M&A TRANSACTIONS

(USD in millions)

Closing Date/ Status	Target	Acquiring Company	Target Location	Acquirer Location	Enterprise Value	EV / LTM		EBITDA Margin
						Revenue	EBITDA	
Announced	FDL	Archer-Daniels- Midland	UK	US	-	-	-	-
Announced	Localpack	Azelis	Colombia	Belgium	-	-	-	-
Announced	Agspec Australia	Azelis	Australia	Belgium	-	-	-	-
Announced	BLH	Azelis	France	Belgium	-	-	-	-
Announced	Integra Plastiks	Borealis	Bulgaria	Austria	-	-	-	-
Announced	Solventis	Brenntag	UK	Germany	-	-	-	-
Announced	ADDAR Chemicals	Chemanol	Saudi Arabia	Saudi Arabia	-	-	-	-
Announced	Lucas Meyer Cosmetics	Clariant	Canada	Switzerland	\$810	8.10x	16.3x	49.7%
Announced	SealesWinslow	Farmlands	New Zealand	New Zealand	-	-	-	-
Announced	SK Pucore	Glenwood	South Korea	South Korea	305	0.57x	-	-
Announced	Wintershall Dea's E&P Business	Harbour Energy	Germany	UK	11,200	-	-	-
Announced	Distribution Business of Joli Foods	IMCD	Colombia	Colombia	-	-	-	-
Announced	Ethylene Oxide & Derivatives Business of LyondellBasell	Ineos	US	UK	700	-	-	-
Announced	Iowa Fertilizer Company	Koch	US	US	3,600	-	-	-
Announced	Sonarome	Robertet	India	France	-	-	-	-
Announced	Imptek Ecuador	Saint-Gobain	Ecuador	France	-	-	-	-
Announced	Celotex	SOPREMA	UK	France	-	-	-	-
Dec-23	Kuchuksulphate	Ruschem	Russia	Russia	115	-	-	-
Dec-23	PT Mitsubishi Chemical Indonesia	PT Lintas Citra Pratama	Indonesia	Indonesia	-	-	-	-
Dec-23	Terratinta	Italcer	Italy	Italy	-	-	-	-
Dec-23	Vina Plasticizers Chemical	Aekyung	Vietnam	South Korea	-	-	-	-
Dec-23	Radian Chemical Products	Barentz	India	Netherlands	-	-	-	-
Dec-23	Acrylicos Vallejo	ProA Capital	Spain	Spain	-	-	-	-

Source: Capital IQ, Mergermarket, Pitchbook and company data

SELECT Q4 2023 M&A TRANSACTIONS (CONT.)

(USD in millions)

Closing Date/ Status	Target	Acquiring Company	Target Location	Acquirer Location	Enterprise Value	EV / LTM		EBITDA Margin
						Revenue	EBITDA	
Dec-23	Vio Chemicals	Biosynth	Switzerland	Switzerland	-	-	-	-
Dec-23	Humens	Leto Partners	France	France	-	-	-	-
Dec-23	Verdant Specialty Solutions	Samyang Specialty Solutions	US	South Korea	\$250	1.19x	-	-
Dec-23	Fertiglobe	Abu Dhabi National Oil	United Arab Emirates	United Arab Emirates	7,665	2.71x	6.7x	40.6%
Dec-23	R&F Industries	Candler Industries	US	US	-	-	-	-
Dec-23	STC Material Solutions	IDEX	US	US	206	4.12x	14.7x	28.0%
Dec-23	Arc Bulding Products	Arkema	Ireland	France	-	-	-	-
Dec-23	Fertilizer Business of Agribios Italiana	Yara	Italy	Norway	-	-	-	-
Dec-23	Oktrade Kimya	Azelis	Turkey	Belgium	-	-	-	-
Dec-23	Assets of Arc Metal	BASF	Sweden	US	-	-	-	-
Dec-23	QGP Química Geral	Innospec	Brazil	US	-	-	-	-
Dec-23	JRF Technology	Ecopol	US	Italy	-	-	-	-
Dec-23	Menkol Industries	Saint-Gobain	India	France	-	-	-	-
Dec-23	Lonomr	Asahi Kasei	Canada	Japan	-	-	-	-
Dec-23	Agro-K	Rovensa	US	Spain	-	-	-	-
Dec-23	American Pacific Corporation	NewMarket	US	US	700	-	-	-
Dec-23	Plastiglas	Verzatec	Mexico	Mexico	-	-	-	-
Dec-23	PolymaxTPE	GEON Performance Solutions	US	US	-	-	-	-
Dec-23	Eastman Texas City	Ineos	US	Luxembourg	-	-	-	-
Nov-23	Nittofc	Ichinen	Japan	Japan	-	-	-	-
Nov-23	Texize	Paladin Holdings	US	US	-	-	-	-
Nov-23	United Carpet	SCI Flooring	US	US	-	-	-	-
Nov-23	Aquapharm Chemical	Philips Carbon Black	India	India	456	1.86x	9.1x	20.4%

Source: Capital IQ, Mergermarket, Pitchbook and company data

SELECT Q4 2023 M&A TRANSACTIONS (CONT.)

(USD in millions)

Closing Date/ Status	Target	Acquiring Company	Target Location	Acquirer Location	Enterprise Value	EV / LTM		EBITDA Margin
						Revenue	EBITDA	
Nov-23	Eskaro Chemical	Alexander Podsekin	Russia	Russia	-	-	-	-
Nov-23	Masterbatch	Koinos Capital	Italy	Italy	-	-	-	-
Nov-23	J&K Ingredients	SK Capital Partners	US	US	-	-	-	-
Nov-23	Paints, Coatings, Adhesives and Life Sciences Businesses of CJ Shah & Co.	IMCD	India	Netherlands	-	-	-	-
Nov-23	Alina	Nippon	Kazakhstan	Singapore	-	-	-	-
Nov-23	T.M.F. Industria de Fertilizantes	Patria	Brazil	Brazil	-	-	-	-
Nov-23	Lubricant Additives Business of Chemtrade	Trecora Resources	US	US	-	-	-	-
Nov-23	Suministro De Especialidades	Formerra	Mexico	US	-	-	-	-
Nov-23	Tongling Chemical Industry Group	Wanhua Chemical	China	China	-	-	-	-
Nov-23	StarChem	Bozzetto Group	Honduras	Italy	-	-	-	-
Nov-23	Recochem	CapVest	Canada	UK	-	-	-	-
Nov-23	Critica Infrastructure	Henkel	US	Germany	-	-	-	-
Nov-23	Access Ingredients	Vivify Specialty Ingredients	US	US	-	-	-	-
Nov-23	OWL Chlor Alkali	Brenntag	US	Germany	-	-	-	-
Nov-23	Crestline Plastics	Conductive Containers	US	US	-	-	-	-
Nov-23	Star Thermoplastic	HEXPOL	US	Sweden	\$27	133x	-	-
Nov-23	KDF Fluid Treatment	Kymera	US	US	-	-	-	-
Oct-23	RBL	Appearance Technology Group	US	US	-	-	-	-
Oct-23	ProFusion Industries	Boyne Capital	US	US	-	-	-	-
Oct-23	SK Enpulse	Hann & Company	South Korea	South Korea	267	-	-	-
Oct-23	BTI	Sandvik	US	Sweden	-	-	-	-
Oct-23	Gilbert & Jones	Shrieve Chemical Company	US	US	-	-	-	-

Source: Capital IQ, Mergermarket, Pitchbook and company data

SELECT Q4 2023 M&A TRANSACTIONS (CONT.)

(USD in millions)

Closing Date/ Status	Target	Acquiring Company	Target Location	Acquirer Location	Enterprise Value	EV / LTM		EBITDA Margin
						Revenue	EBITDA	
Oct-23	Tournaire Plastic	Ipackchem	France	France	-	-	-	-
Oct-23	Morro Verde	Ore Investments	Brazil	Brazil	-	-	-	-
Oct-23	PPG's Traffic Solutions Business	Geveko Markings	Australia	Sweden	-	-	-	-
Oct-23	Military / Aerospace Division of West Penetone	Integrity Partners Group	US	US	-	-	-	-
Oct-23	Millbaker	Somapro	France	France	-	-	-	-
Oct-23	Nanocyl	Birla Carbon	Belgium	India	-	-	-	-
Oct-23	VAC	Ara Partners	Germany	US	-	-	-	-
Oct-23	Vycom	AZEK	US	US	-	-	-	-
Oct-23	GoudenKorrel	Elvita	Poland	Poland	-	-	-	-
Oct-23	BGC's Fibre Cement, Plasterboard Business	Etex	Australia	Belgium	-	-	-	-
Oct-23	MF Paints	Protech Group	Canada	Canada	-	-	-	-
Oct-23	VITRON Spezialwerkstoffe	Solcera Group	Germany	France	-	-	-	-
Oct-23	TSE TROLLER	Indutrade	Switzerland	Sweden	-	-	-	-
Oct-23	Punto Verde	AMVAC Latam	Ecuador	Costa Rica	-	-	-	-
Oct-23	Warwick Chemical Mostyn	International Process Plants and Equipment Corporation	UK	US	-	-	-	-
Oct-23	Advanced Organic Materials	Kensing	Argentina	US	-	-	-	-
Oct-23	Volunteer Materials	Armada Materials	US	US	-	-	-	-
Oct-23	LFP Cathode Technology Centre	Epsilon Advanced Materials	Germany	India	-	-	-	-
Oct-23	P-D Refractories CZ	RHI Magnesita	Czech Republic	Austria	\$47	0.26x	-	-
Oct-23	Como Oil & Propane of Florida	Palmdale Oil Company	US	US	-	-	-	-
Oct-23	CedarChem	Solenis	US	US	-	-	-	-
Oct-23	American Gas Products	Air Water America	US	US	-	-	-	-

Source: Capital IQ, Mergermarket, Pitchbook and company data

About Lincoln International

We are trusted investment banking advisors to business owners and senior executives of leading private equity firms and their portfolio companies and to public and privately held companies around the world. Our services include mergers and acquisitions advisory, private funds and capital markets advisory, and valuations and fairness opinions. As one tightly integrated team of more than 950 employees in more than 20 offices in 15 countries, we offer an unobstructed perspective on the global private capital markets, backed by superb execution and a deep commitment to client success. With extensive industry knowledge and relationships, timely market intelligence and strategic insights, we forge deep, productive client relationships that endure for decades. Connect with us to learn more at

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