

INSCX™ exchange – The Integrated Nano-Science & Commodity Exchange

INSCX exchange is a patent-pending commodity exchange dedicated to trade in accredited and compliant engineered nanomaterials and nano-enabled commodities in addition to other more traditional materials, polymers, base oils and titanium dioxide. INSCX operates to provide real-time, electronic trade facilities in a series of listed instruments in Global and Regional contracts based on the physical supply and delivery of engineered nanomaterials.

The exchange trading platform is an electronic communications network (ECN) accessible to registered users of the Exchange. INSCX exchange <http://inscx.com> is a closed-user commodity exchange system specific to physical trade in Engineered Nanomaterials, nano-enabled commodities, objects, and devices (ENMs). The Exchange lists ENMs by thematic class, and other materials, Polymers, Base oils and pigments. The INSCX deliverable is an electronic trade platform. INSCX is based in Cheshire, North-West UK, operating EU and American (EST) business hours. Members of the Exchange are classed either Commercial or Non-Commercial members; Commercial members being producers and downstream users, both who instruct trade in ENMs listed on the Exchange via Non-Commercial members. The later are governed by the Exchange in accordance with convention long established.

Listed for trade are:

Engineered nanomaterials

Nano-enabled commodities, objects, devices

Polymers

Base Oils

Titanium Dioxide

INSCX exchange provides market coverage across Europe and North America. Members of the UK Centre for Process Innovation sponsored NanoCentral Alliance; INSCX combines expertise in nanoscience and nanotechnologies with the first-hand experience of seasoned professionals from within the global securities and commodity industry.

The exchange ruling committee, is an independent Board of Governors and lists representation from nanoscience, industry and insurance in addition to senior figures from within the global securities and commodity trading community.

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Nanoscience & Nanomaterials

Nanoscience is the study of phenomena and manipulation of materials at atomic, molecular and macromolecular scales, where properties differ significantly from those at a larger scale.

Nanotechnologies are the design, characterisation, production and application of structures, devices and systems by controlling shape and size at nanometre scale. Engineered nanomaterials, in essence the raw materials associated with the generic field of nanotechnologies are for want of a better description, alternative, precision engineered material commodities.

These materials command cross-disciplinary use and applications across many zones of the existing global economy. In a commercial context nanomaterials can only be regarded as raw materials or commodities, although the industry has had difficulty in certain cases separating raw commodities from application. As raw materials and commodities used in secondary manufacturing to deliver improved and more functional materials to meet innovations in application and product needs across areas as diverse as aeronautics, automotive, construction, electronics, energy storage and provision, fuel cell technologies, food and agriculture, energy, green technologies, polymers, solar power, pharmaceuticals and medical diagnostics, plastic electronics, telecommunications and water to name but a few, the generic suite of raw materials is derived through application of processes peculiar to nanosciences and application of nanotechnologies.

In a commercial context, a common process used to engineer nanomaterials, Chemical Vapour Deposition (CVD), for example, although completely different in application, can only be regarded as similar in concept to that of "cracking" or refining for example crude oil. An easy interpretation therefore, for the purpose of becoming more familiar is to regard the processes used to engineer a nanomaterial as the nanoscience equivalent of common refining or cracking processes which are commonplace in the crude oil and fuel markets.

What are Commodities?

Commodities are broadly defined as natural resources, chemicals and physical products you can touch, taste, smell, grow, mine, consume or deliver. From their origins in the 1500s until the 1970s, commodities and futures markets were one in the same; financial futures are a modern-day invention. To confuse things slightly, today the term "commodities" is still often used as a broad industry term describing all futures commodity contracts, including financials. For example, "commodity trading advisor" is used to define an individual or firm who operates a managed futures program, even though many of them trade exclusively in the financial futures markets such as interest rates or stock indexes. Trading commodities that encompass physical products are the origins of the modern commodity futures industry and still play

a valuable role in the global marketplace, even though the most highly traded futures today are financial contracts such as U.S. Treasury notes, Eurodollars, and Standard & Poor's 500 stock index futures contract.

The most popular contracts for commodity trading cover several broad categories: metals, energy, grains, livestock, and food and fiber. These are not paper assets, and in general, are produced and consumed at a price based on the forces of supply and demand.

A commodity futures contract represents an agreement to buy or sell a specific type and grade of commodity for delivery at a specific time in the future at an agreed upon place at a market-determined price. In reality, commodity futures used in more mature commodity markets rarely lead to the delivery of an actual product, because the contract positions are typically closed out before the delivery date.

Commodity investing also includes commodity options that convey the right to buy or sell the underlying commodities futures contract.

What is a Commodity Exchange?

A commodities exchange describes an organisation that oversees commodity trading, creating and enforcing the rules governing trading. A commodities exchange can also be the actual location where commodity trading takes place. There are physical commodities exchanges all over the world. Each commodities exchange trades different types of commodities. For example, the Chicago Board of Trade trades agricultural commodities and biofuels, the Hong Kong Merchandise Exchange trades gold, and the Nepal Derivative Exchange Limited trades metals and energy. Some exchanges trade only very specific commodities, such as the Integrated Nano-Science Commodity Exchange in London, which trades engineered nanomaterials, polymers, base oils and titanium dioxide.

The commodities exchange in the late 1500s with the founding of the Royal Exchange in London, a forerunner of the current day London Metal Exchange. The use of futures or forward contracts as a feature of commodity trading began in the agricultural sector in the 1850s as a way for farmers to trade their crops. A farmer would use the commodity exchange to offer what he had for sale, and then buy what they needed. Then farmers began to pay in advance for a crop they would need at a future date. For example, they would pay in April for corn to be delivered in August. If the corn crop was poor that year, and their demand drove up the price, the farmer might find that his contract to buy corn in August was now at a very attractive price, so attractive that he could sell the contract to another farmer and make more money than if he had purchased the corn as agreed and fed his livestock with it. Thus, the commodity future was born.

The global commodity marketplace includes almost 100 primary products, such as gold, oil, electricity, industrial metals, soybeans, and coffee to name but a few examples of raw materials and commodities traded. On financial commodity exchanges, investors using these financial Exchanges where delivery is of a last resort, can buy commodities futures contracts, predicting whether the price of a given commodity will go up or down. The farmer who bought the corn future was betting that the price of corn would go up, making the contract he purchased in April more valuable when it came due in August. Futures and Cash contracts are traded on commodity exchanges.

The trading of futures, including margin trades and options, has far outstripped the trading of actual commodities. Many investors who trade commodities have no direct involvement with the raw material being traded. Commodity trading is well suited to electronic markets, simply because there are so many commodities exchanges around the world. Now that most trading is conducted electronically, commodities futures trades are conducted instantly and the traded commodities reflect the most accurate price.

INSCX: How is trade conducted?

A variety of physical commodities are listed for trade on INSCX but solely for physical delivery as opposed to investment and/or speculative purposes. In these respects, INSCX differs from the majority of other Exchanges.

Other Exchanges

There are commodity exchanges all over the world, from the UK to North America to the Far East. Key exchanges in Europe are the London Metal Exchange, Baltic Exchange and the Inter Continental Exchange (ICE). Overleaf we list some of the exchanges in North America. These North American exchanges offer futures trading in physical commodities and their corresponding contract listings are listed below, although neither list is exhaustive.

The list is provided to indicate the scope of raw materials that trade in North America on formal exchanges.

- [CBOT – Chicago Board of Trade](#)
- [CME – Chicago Mercantile Exchange](#)
- [KCBOT – Kansas City Board of Trade](#)
- [MGEX – Minneapolis Grain Exchange](#)
- [ICE Futures Canada](#) (formerly WCE – Winnipeg Commodity Exchange)
- [ICE Futures U.S.](#) (formerly [NYBOT – New York Board of Trade](#))

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- [NYMEX – New York Mercantile Exchange](#)

Contract-specific Links to Exchanges

Chemicals

Benzene [CME/GLOBEX](#)

Mixed Xylenes [CME/GLOBEX](#)

Energy

Coal [ICE](#)

Crude Oil, Brent [NYMEX](#)

Crude Oil, Light Sweet [NYMEX](#)

Crude Oil, miNYSM [NYMEX](#)

Ethanol [ICE, CME](#)

Gasoline, Unleaded [NYMEX](#)

Heating Oil [NYMEX](#)

Natural Gas, Henry Hub [NYMEX](#)

Natural Gas, miNYSM [NYMEX](#)

PJM Electricity [NYMEX](#)

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Propane

[NYMEX](#)**Fertilizer**

Diammonium Phosphate (DAP)

[CME/GLOBEX](#)

Urea Ammonium Nitrate (UAN)

[CME/GLOBEX](#)

Urea

[CME](#)**Food & Fiber**

Butter

[CME](#)

Cocoa

[ICE](#)

Coffee "C"

[ICE](#)

Coffee "C" Mini

[ICE](#)

Cotton #2

[ICE](#)

FCOJ

[ICE](#)

Milk – Class III

[CME](#)

Milk – Class IV

[CME](#)

Milk – Nonfat Dry

[CME](#)

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Sugar, #11 World

[ICE](#)

Sugar, #14 Domestic

[ICE](#)**Grains & Oilseeds**

Barley, Western

[ICE](#)

Canola

[ICE](#)

Corn

[CBOT](#)

Corn, Mini

[CBOT](#)

Corn Index, National (NCI)

[MGEX](#)

Flaxseed

[MGEX](#)

Oats

[CBOT](#)

Rough Rice

[CBOT](#)

Soybeans

[CBOT](#)

Soybeans, mini

[CBOT](#)

Soybean Meal

[CBOT](#)

Soybean Oil

[CBOT](#)

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Soybean Index, National (NSI)	MGEX
Wheat	CBOT
Wheat, Hard Red Winter	KCBOT
Wheat, mini	CBOT
Wheat, Feed	ICE
Wheat Index, National (HWI)	MGEX
Wheat, Spring (Hard Red)	MGEX
Indexes	
Goldman Sachs Commodity Index (GSCI)	CME
Reuters CRB Index	ICE
Livestock/Meat	
Feeder Cattle	CME
Live Cattle	CME
Lean Hogs	CME
Pork Bellies, Frozen	CME

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Metals

Aluminum	NYMEX
Copper	NYMEX
Gold	NYMEX
Gold, Mini	CBOT/e-cbot
Gold, 100 oz.	CBOT/e-cbot
Palladium	NYMEX
Platinum	NYMEX
Silver	NYMEX
Silver, Mini	CBOT/e-cbot
Silver, 5,000 oz.	CBOT/e-cbot

Wood

Random Length Lumber

What is a Commodity Marketplace?

A commodity market is a location where a Seller and a Purchaser can come together to complete a transaction. Typically the market has been a physical location where the actual goods and services (materials, resources, commodities, capacities) being offered for sale were brought so that potential purchasers could examine and evaluate them for quality and quantity. The “Kerb” in the City of London

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was the original venue for transacting insurance, for example, while the Royal Exchange in London focused on metals. Chicago developed as a centre for agricultural commodity trading, while New York developed as a centre for trading oils and precious metals. More recently with the advent of electronic trade platforms from the 1970's many exchanges now are either totally electronic or combine traditional, physical floor trade with ability to trade via an electronic interface. INSCX exchange operates as an electronic market.

Terminology - Commodity

The universal term within industry to describe everything from Crude Oil to a soyabean is a commodity, with individual commodities listed for trade often referred to as products. In keeping with this universal terminology, as we are describing products in the context of INSCX exchange, we will refer to all materials, resources, commodities and capacities listed on INSCX using the generic term, Commodity. However, on INSCX many of the "commodities" are not commoditized, meaning produced to uniform specification by more than one producer. Rather, in many cases the commodity is unique to a single producer.

Pricing

The pricing for any commodity is influenced by its abundance or scarcity, which is a reflection of the conditions necessary to, and ability to, produce the commodity, and the need/demand (or even desire) for the commodity. The interaction of Sellers and Purchasers competing with each other to sell (offer) or evaluate and purchase (bid) a specific commodity essentially create the "market price" for the commodity.

Price Discovery

Price discovery is a key function of any marketplace, from a property auction to a commodity exchange. The price at where trade occurs in any commodity flows from the interaction between Supply and Demand to indicate whether a commodity is abundant or scarce. Price indicates the level of demand for a commodity, where one or many Sellers will sell the commodity for, and just how much one or many Purchasers will pay for it. In an "efficient market" such as commodity exchange, there is not necessarily a pre-existing relationship between the Seller and the Purchaser, and there is no fixed, minimum or maximum price for a commodity.

Often the trade volume of a commodity will stall at a certain price and the abundance/volume of the commodity will be cleared at a certain price, essentially reaching a price equilibrium where Sellers and Purchasers are receiving and paying exactly what they want or what they need. The purpose of a financial commodity market is to promote trade and enable risk transfer. The market transaction can be for either

the immediate sale, purchase and delivery of the commodity (cash or spot price/market) or for the sale, purchase and delivery at a later date (futures contract/ market). The transaction can be completed on an exchange, which has, and the participants agree to abide by, a formal set of rules and regulations that govern the quality, quantity, pricing, sale and delivery of the commodity or service (the exchange monitors and manages the transaction). The transaction can be "Over-the-Counter" (OTC), which is semi-private transaction where Seller and Purchaser issue instructions to an Approved Merchant member of the exchange.

The transaction process involves each Broker adhering to rules and regulations governing trade conduct and oversight rules safeguarding customer interest (Seller and Purchaser). This differs from a private off-exchange transaction where usually the Seller and the Purchaser are the only market participants in the transaction. The formal and managed exchange can still be a physical location where non-professionals (cash market) or professionals (cash and futures market) stand face-to-face to complete a market transaction (market participants).

The formal and managed exchange can also be an electronically-linked network where non-professional and professional market participants communicate information about the quality, quantity, pricing, sale and delivery of the commodity or service through telecommunications and/or computer-based network, or what is referred to as an ECN (Electronic Communications Network). INSCX exchange conducts trade as an ECN.

Who participates in Commodities Markets?

There are three basic types of participants in commodities:

Physical users, or suppliers wanting to trade, market-hedgers and speculators. Market hedgers tend to be also referred to **Commercial users**. Hedgers seek to minimize and manage price risk, while speculators take on risk in the hope of making a profit. As an example, we will focus on the grains market, corn to provide examples of the distinction. As an example of a hedge, let us assume the position of a large corn farmer wanting to sell product at the highest possible price. As unpredictable weather may create risk, or excess supply that could drive prices down, the farmer could take a short position (sell to buy back cheaper) in corn futures, and if prices fall, he could then buy back the futures at a lower price than you previously had sold them.

This could offset a possible loss from the cash crop, and help minimise the farmer's risk to a guaranteed profit. Of course, if prices rose, before the crop harvested, the farmer would stand to lose money on the futures transaction as he would have to make good delivery on expiration of the futures contract.

However, the flip-side of the equation relates to a need the farmer had to lock in a guaranteed return on the cash crop in advance using futures as a hedge.

A speculator can include individual investors and professionals such as hedge funds or managed futures traders, each taking the opposite side of the hedger's futures transaction or just trading for hope of profit. A short trader (selling hoping to buy back cheaper) would of course bear the risk that prices rise, or a long trader (buying, hoping to sell higher) would risk that prices fall. In most cases these speculative traders have no material interest in the physical material other than hoping to profit from futures trading. These participants do however, act to price in fundamental or economic factors that influence price direction quickly (thus aiding physical market participants adjust to changing environments) and provide liquidity to the extent where the exchange is able to display a continuous buying and selling price during market hours.

A commercial food producer in need of the raw product (a breakfast cereal processor, for example) may also take the other side of the short hedger's trade to offset the risk of paying higher prices for the commodity. If the price of corn rises, the commercial food producer could still capture a profit from the futures position, even though he'd be paying more for the actual corn.

As we have seen individual traders who commit their own capital to act as speculator on a particular exchange provide market liquidity by constantly buying and selling throughout the trading session and are viewed as important participants in the market by shouldering risk. While the term local has been used to designate those trading in the open-outcry markets, (Physical pit-style trading floors) the era of electronic trading is making the phrase "local" seem a little obsolete. However, the individual trader's or non-commercial user's function as liquidity providers is proven just as equally important in electronic markets. The industry defines this new breed of electronic traders "E-locals," but they are often more simply known as independent traders or non-commercial users.

Controls

Speculative activity on formal commodity exchanges is highly controlled, for want of a better word policed, by the Exchanges themselves. Rules such as Open Interest disclosure, imposed circuit breaks, agency/principal and uptick rules in addition to mandatory reporting of trade executions help control excessive speculative activity.

In broad terms therefore, we have three types of users; Commercial – Suppliers and Purchasers who use commodities for trade purposes and Non-Commercial – merchants, either acting for physical users of listed commodities and on financial investment exchanges, investors and speculators who trade commodities for speculative gain.

Exchanges

The world's investment and commercial community use the exchange process to meet a variety of individual commercial requirements through employing a series of trading techniques to execute transactions pertaining to the allocation of resources, whether in raw materials and commodities or in capital or financial instruments.

There are exchanges for the:

Sale and purchase of stock / equities (capital market)

Sale and purchase of debt securities / bonds (capital market)

Sale and purchase of currencies (Foreign exchange market for futures and options; there is no exchange for spot transactions)

Sale and purchase of bank loans

Agricultural (soft) commodities (futures and options)

Base metals and precious metals (hard) commodities (futures and options)

Event Futures (economics, politics, sports)

Energy-related commodities (petroleum, refined petroleum, natural gas, coal, electricity)

Physical Polymers (INSCX)

Physical Nanomaterials (INSCX)

Physical Titanium Dioxide (INSCX)

Physical Base Oils (INSCX)

Financial instruments futures and options (derivatives market on stock prices, bond prices, exchange indices, currency rates, interest rates, risk transfer)

Weather or catastrophe risk

Trade in the allocation of resources, materials or for want of a general description, commodities, are conducted across the world using a series of dedicated "commodity" exchanges. Several exchanges specialise in the exchange of a particular commodity, although most of the major exchanges facilitate trade across a broad suite of different commodities which are referred to as either Hard or Soft

commodities. A “Hard” commodity or material is for example a metal, whereas a “Soft” is usually a grain or an agricultural product. It is important to appreciate the fundamental role of any commodity exchange is to provide facilities where members can trade. The exchange does not trade the market itself, taking positions as it were. Rather the Exchange guarantees the integrity of the trade process by enforcing rules on its members. It is the exchange members themselves who work the Exchange to commit to the financial aspect of the trade (payment) and the material aspect (supply). The exchange in effect ensures trade integrity.

Memberships

Exchange memberships are “Approved” by the exchange distinguished between Commercial and Non-Commercial members. Trade is conducted Commercial member to non-commercial member to commercial or non-commercial member. In other words to trade the Exchange will usually insist the producer instructs their non-commercial member, or merchant to place their order onto the exchange trade floor.

Merchants are permitted to act as agent and/or principal traders. These agent and principal traders are typically professionals who execute customer instructions. These members act as agents accepting instructions from customers to sell or purchase a given commodity, and in certain circumstances Merchant members are permitted to trade as Principal (trade solely for speculative gain). Customers are by definition defined as either Commercial or non-Commercial users.

On INSCX exchange, for example a Commercial user is either a producer or end-user of a listed commodity, while a non-commercial user is a Merchant authorized by the Exchange to place an instruction on the trade floor on behalf of a Commercial user, or an Associate Trade member, often the sales arm of a producer.

We have already discussed the distinctions in user or participant; Commercial/Non-Commercial. To recap, a Commercial user or “Customer” is typically a supplier or purchaser who has a trade interest in the commodity (needing it for a process of manufacture, or supplying it as the manufacturer or in the case of nanomaterials, the engineer.) A non-commercial user or “Merchant” is a person or organisation that has no trade interest in the materials beyond seeking to trade it for speculative gain or on the instruction of a Commercial user. An Associate Trade Member, as we have seen can often be the sales/trading arm of a Producer.

Confusion with Stock Exchanges

Commodity exchanges are sometimes confused with “Stock” exchanges, and although there are similarities in exchange practices between either class of exchange, the difference between a stock exchange and a commodity exchange relates to what each type of exchange facilitates trade in. A stock

exchange is where a company's shares are traded while a commodity exchange is where resources and materials (Commodities) are traded.

Why an Exchange?

The commodity exchange has been used for centuries as a mechanism to structure efficiencies in the trade process to allocate scarce materials and resources. The market mechanism employed by the exchange process has created venues where interests; Sellers and Purchasers, in materials as diverse as oils, grains and metals have been able to meet to conduct trade to agreed sets of rules and standards. Commodity exchanges quantify the foundations of any commercial activity reliant on the supply and use of raw materials. Within the exchange process trade participants, commercial and non-commercial, have used the exchange model to quantify variables of price, specification, standard and financial performance across materials and resources.

Relevance of INSCX - Nanomaterials

The global market in engineered nanomaterials and nano-enabled commodities is in commercial terms relatively new and the industry has not yet organised itself using a commodity exchange model to establish rules of trade in these raw materials. The absence of a process to agree the variables associated with the trade process; price, specification, standards and regulation, is a situation which has contributed to the fragmented commercial development of the sector. Global business is accustomed to using the commodity exchange process.

Quite apart from using employing techniques to hedge risk, the community uses the exchange process to identify standards, pricing, supply capacity and ensure trade integrity, which enables the use of raw commodities to be integrated into a process of manufacture to deliver applications and products. Nanomaterials are regarded by the business world outside the scientific and academic community as no more than an innovative suite of alternative, raw materials. That stated, without an organised process of trade in nanomaterials, it becomes increasingly difficult for any business to make commercial use of nanomaterials beyond the novel.

INSCX exchange delivers into being the anchor on which to structure the exchange of the raw materials and commodities which underpin the industry of nanoscience and nanotechnologies, where users can afford to reallocate capital resource to become more reliant on the procurement and use of these raw materials to further the commercial process of secondary manufacture, application and production of goods and services.

The sole purpose of INSCX exchange is to deliver the framework which enables business to use nanomaterials to the extent that it currently relies on the use of more traditional resources and

commodities. The objective of INSCX is simply to increase trade flows across the broad suite of alternative materials.

The commercial reality should not be construed as an attempt to undermine the potential held by nanomaterials, but to point to a key deficiency within the industry which restricts cohesive, commercial growth.

Relevance of INSCX - Polymers

The global polymer industry has struggled over many years to create a basis for accurate and auditable pricing of physical polymers. Several leading financial commodity exchanges have sought to list polymer “futures” in Polypropylene (PP) and Polyethylene (PE) with limited producer/end-user support as a consequence of the many different grades of polymers, many unique to single producers, particular European and US producers.

The financial contracts in Polymers listed on the London Metal Exchange and more recently on ICE and the CME have often tended to lack liquidity in their own right thus making trade in these contracts considerably less attractive to the speculative trader. INSCX exchange (while recognising the potential for polymer Futures contracts) have spent several years canvassing the opinion of the physical market (Producers and end-users).

During 2014 the Exchange introduced Fixed Term pricing and Producer “REPO” contracts, the former as a means where producers could offer their existing pre-approved end-user customers the ability to hedge price risk over a term commitment. The objective has been first to establish a true hedge and wide support in the physical industry for real-time pricing and to take this forward in due course with the financial exchanges as a means to structure investment-grade futures.

In 2015 INSCX moved a step further towards creating a real-time market in physical polymers based on Aggregate pricing of polymers within chemical families. For example, INSCX lists physical polymers on a Spot, Contract and 3, 6, 9, 12 month forward deliver basis. Access to conduct physical trade in Polymers via INSCX is reserved solely for producers, their approved end-user customers and distributors. The Exchange also permits non-trading members to access price and aggregate trade data.

A key feature of INSCX is that the exchange or its Merchant members are not permitted to recommend one producer grade over another, rather to present a live benchmark on the basis of Aggregate pricing within a polymer chemical family where producer approved end-users can bid for specific grades +/- the Aggregate price, with final price negotiation reported as a trade in the chemical family as opposed to the specific grade so as to safeguard producer/end-user confidences. Accordingly, INSCX lists Polymers within the following chemical families.

Polypropylene (PP)

Homopolymer

Impact Copolymer

Random Copolymer

Polyethylene (PP)

LDPE (autoclave)

LDPE (Tubular)

LLDPE (C4)

LLDPE (C6)

LLDPE (C8)

HDPE

HDPE (Pipe)

mLLDPE

Polymer Price Display

Prices within each of the chemical families on INSCX are displayed on an Aggregate price basis, real-time during market hours. By this we mean that quotes are displayed per chemical family on an Aggregate basis for Front Month, 3, 6, 9, 12 months fixed quoted both on a Spot and Contract supply basis.

Individual producer prices across grades within a chemical family are hidden known only to the individual producer.

Polymer Reporting

INSCX users have the option to use the Exchange to physically trade or simply report physical trade to the Exchange specialist who, on receiving buyer/seller confirmation (in the case of a reported trade) will report the trade as per the chemical family as opposed to specific grade. In this way, the confidences of individual producers and end-users, participants who could be identified were trade in a specific grade to be reported, is safeguarded.

For example, let us say a trade in an Exxon grade of LDPE (Autoclave) Grade X was purchased by an approved Exxon customer, how would this trade be reported so as to safeguard the right to confidentiality the producer and buyer reserve? On the trade being confirmed and electronically agreed by both the producer (selling) and the producer approved end-user (buying), the Exchange specialist would print the trade as follows. Let us assume the price was \$1400/Mt, and the quantity sold on a Spot basis was 100/Mt.

The trade would be displayed as follows:

100/Mt LDPE(A) Spot FD/UK @ \$1400/Mt

This way only the actual producer (Exxon) and the actual, approved end-user know the particular grade, while the remainder of the market are aware that 100/Mt of LDPE (Autoclave) traded at the price reported.

Polymer Forward Pricing

Polymers are listed for trade Aggregate by Chemical family on a Spot and Contract price basis front month and on a 3, 6, 9, 12 month forward delivery basis. Producers using the Exchange are permitted to sell from existing fabricated stocks and in the case of a forward purchase are paid in full at front month + Producer offtake premium for the full quantity of the term purchase on agreeing a trade. Let us assume a trade pertains to a sale of 1,000/Mt on a 3 month fixed basis for 3 month deliveries each of a 1000/Mt. On agreeing to trade via the Exchange, the specialist merchant will calculate Front Month + Producer offtake plus financing and reflect this to the approved end user buyer.

Assuming the trade is agreed, the Specialist merchant will buy and pay the producer for 3,000/Mt instructing the producer to release 1,000/Mt per month to the approved end-user buyer x 3. The end user buyer will then be obligated to pay the Specialist Merchant either at the end of the 3 month term or on the occasion of each monthly delivery. The trade will then be reported as say 3000/Mt LDPE (A) Spot FD 3m @ \$1400/Mt.

Relevance of INSCX - Titanium Dioxide

INSCX operates on a similar basis within the various producer grades of Titanium Dioxide. The Exchange does not act to recommend one producer grade over the other, but rather to execute a trade in the grade chosen by the end-user. Similarly, a trade is reported as either TiO₂ Rutile or TiO₂ Anatase so as to safeguard confidences. A key service the Exchange manages through the Specialist Merchant which has proved popular is door-to-door delivery of the primary Chinese grades to Europe and North America for end-user clients.

Benefits of INSCX

INSCX exchange delivers a global commodity marketplace to agree rules of trade across a broad suite of engineered nanomaterials, polymers, base oils titanium dioxide. INSCX therefore represents a first for the respective commodity classes of materials it lists for trade. In the context of nanomaterials, the exchange project represents the first global move of significance to develop self-regulation within nanoscience and nanotechnologies focusing on delivering an organised, rule bound process to conduct trade in the raw materials base underpinning both nanoscience and nanotechnologies. As with any exchange system, INSCX acts to unite competing interests; commercial and non-commercial, and provides the self-regulating trading structure to enable regulators and governments to interact to drive the integration of nanomaterials as compliments to the existing global economic superstructure. There are many obvious benefits associated with using a commodity exchange model to unite these separate but interwoven competing interests. The rationale is further outlined in a series of PDF documents available for readers to download off the website.

Several reasons underpinning the rationale in summary are;

Qualifying Variables

INSCX exchange delivers the mechanism to balance competing interests across the commodities listed for trade benchmarking their potential to variables quantified through the workings of an open and transparent marketplace. Without being able to quantify price, standard, capacity and trade indemnity, all factors necessary to drive industrial trade flow in the first instance, any commodity class will struggle to function cohesively and, in the case of nanomaterials, struggle to convert potential to commercial usefulness. INSCX exchange provides the ability to quantify these variables in an organised, cohesive manner.

Nanomaterials - Capital Reallocation

INSCX exchange enables the anchoring of nanomaterials and nanotechnologies into the existing commercial superstructure. The exchange creates the marketplace foundation upon which to advance the process of structured embedding and convergence.

Market forces are employed to drive a smooth transition of capital reallocation from existing to advanced technologies.

This in turn delivers into being a situation whereby increased use and application of engineered nanomaterials acts as a compliment to deliver societal and economic benefits in addition to delivering the necessary trade flows to ensure the fiscal sustainability to emerging nanobusiness.

Nanomaterials - Education

INSCX exchange deploys dedicated technical staff to guide the nanobusiness community to use exchange facilities best suited to their requirements. From guiding producers through the trade process, to being able to access FSA regulated global foreign exchange and fund transfer services, to guiding participants toward professional, value driven ancillary services, INSCX acts to educate nanobusiness to recognise collective capital value.

That said, we fully appreciate that even in the existing world of business that commodity exchanges appear insular and are unfamiliar to many outside their specific remit. Education and support is structured to enable any producer, user and or traditional commodity brokerage use the market to satisfy needs and engage in the efficient trade of engineered nanomaterials and nano-enabled commodities. Unfamiliarity with nanoscience we accept may extend also to many within the securities and commodity industry. The exchange acts to provide insight into the alternative suite of raw materials that require the equal of supports provided by the non-commercial brokerage community in the context of traditional resource and materials markets.

Nanotechnology - Radical Nature

Nanoscience and nanotechnologies are not just innovative technologies, but the basis to bring into being a cross-disciplinary paradigm shift delivering both opportunity and responsibility. The generic field will inevitably evolve to move from integration to convergence, engendering a transition from Newtonian to quantum physics, from top down assembly to molecular self-assembly to the use of programmable matter.

The transition to develop the advanced commercial and industrial businesses of the future requires structuring and adherence to rules to deliver any sustainable societal and economic benefit. The foundation on which to build any innovative process of industrial activity involving the use and application of nanomaterials must be based on structuring an organised procedure of exchange. INSCX exchange will evolve to help empower nanotechnologies through delivering the market mechanisms necessary to promote commercial integration.

From providing the base to structure trade in the raw materials that unpin the science the exchange will act to further anchor and stabilise the use of nanomaterials as industrial-grade commodities in their own right.

The mechanisms employed will deliver trade efficiency and certainty. The trading process will enable a balancing of competing interest, the quantifying of economic variables based on presenting the visible price of raw materials necessary to further use and application, providing the ability to weigh benefit versus risk. From this structured departure point, a commercial home where efficient trade of these raw

materials can be conducted is brought into being by the exchange process to drive a momentum which acts to smooth the wider embedding of nanomaterials and nanotechnologies as a compliment to the existing and future structures of global trade.

Regulation

INSCX exchange operates as a self-regulating organisation (SRO) promoting close cooperation with regulatory authorities engaged in the evolving oversight of engineered nanomaterials. The exchange is disposed in principal to interact with responsible and compliant interests to develop standards and “good conduct” among industry participants to deliver a prudent commercial sustainability. INSCX exchange will abide by any regulation, whether domestic or international, governing the exchange, manufacture, use and application of engineered nanomaterials, and operates rules binding a compliance with these regulations on all exchange members and customers. Global regulators are welcomed to discuss any aspect of exchange activities.

Specific to engineered nanomaterials, objects and devices the Exchange operates a mechanism known as Downstream Audit Sequencing (DAS). The DAS mechanism ensures each trade in a consignment of ENMs conducted through the Exchange is categorized, independently characterized, and track/traced from upstream to downstream user. The DAS mechanic is employed to sequence each trade meaning in the case of ENMs (and derivative thereof) that each trade can be uniquely referenced as the consignment moves through the supply-chain to end product, object or device. Each ENM trade is issued a DAS code; a unique numeric code which can (should regulation agencies wish) be used as a basis for inclusion in CLP. Furthermore, DAS, can form a basis to reverse-cycle audit any recorded ENM trade whether downstream/upstream to provide a reference to regulation agencies/insurers to safeguard economic and societal interest should any risk arise be deemed to have arisen from commercial use of ENMs.

The existence of DAS is already known to insurance underwriters/brokers working with INSCX and to regulators, particularly in the UK (DEFRA, HSE, and Environment Agency). One view, apart from enabling reverse-audit back to source in the event of long-tail risk arising, is that DAS constitutes a solution to the need regulation agencies have to structure reporting of trade in ENMs. The INSCX system provides functionality for insurers and regulators; an in-depth measure of compliance in the supply of ENMs, real-time supply-chain analysis identifying the commercial ownership of risk, and constitutes a working global reporting system for trade in these materials.

Summary

INSCX exchange provides the commercial blueprint to advance the commercial integration of engineered nanomaterials and a means to solve fundamental problems within the existing pricing/trade of polymers, base oils and titanium dioxide.

The exchange poses no threat to any organisation seeking to gain from the compliant, commercial growth in use of these materials or act in any way to express preference one producer over another. The Exchange is based on price neutrality and is strictly geared to accommodate producers and end users of the materials listed for trade.

INSCX offers key benefits to the fledgling nanoindustry, which should be apparent to any vested interest; (Academic, Business, Supplier, Investor, Government, Regulator, Researcher) engaged in the promotion of nanoscience and nanotechnologies.

However, INSCX is not engaged in a “hard sell” and will not compel any organisation to become members or customers of the exchange. On the contrary, we can only recommend the industry participates to develop the exchange as a key institution which lends support to the cohesive, commercial future of the materials INSCX lists for trade including aiding more compliant nanoscience and nanotechnologies through enabling wider use of nanomaterials.

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