

Hazardous Engineering Solutions



Incorporating Health & Safety

The International Magazine For
Hazardous Area Professionals

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A better way to perform maintenance inspections



Beamex has created a new, mobile, paperless solution for maintenance related inspection activities like checks for preventive maintenance, safety instrumented systems and hazardous area installations. Beamex bMobile is a new mobile app for Android devices. Combined with CMX calibration software, the solution creates a totally paperless system for maintenance checks.

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Are You Struggling With All Your Maintenance Inspections?

Is the scheduling, performing and documenting of your preventive maintenance, safety checks, safety instrumented systems (SIS), and hazardous area installation inspections (among many others) still paper based, labor intensive and error-prone?

With more than 40 years' experience of providing calibration solutions for the process industry, we know that every process plant has various inspections that must be done regularly, and we know that these can cause a major headache. That is why we have created a better way to perform maintenance inspections.

The Beamex solution includes CMX Calibration Management software and an optional Android mobile device application called Beamex bMobile. CMX software communicates with the bMobile application enabling a streamlined and fully paperless solution for maintenance inspections.

When using CMX software for inspections, you can plan and schedule all your activities and create detailed instructions for each inspection. When it is

time to perform the inspection, you send the work order(s) from CMX to the mobile device—whether an Android tablet or Android phone—and go out into the field. While in the field, the bMobile application guides you through all the steps, allowing you to make the Pass or Fail decision and add notes. The test results are stored in the app. When you return to the office, upload the results into the CMX software, which are then automatically stored in the database. Reports may be created, emailed or printed if necessary, and the work orders are updated.

For further information on CMX maintenance inspection & calibration software visit the Beamex website or contact Beamex in the UK.

The Beamex bMobile application will soon be available on Google Play and on Beamex website.



For more information, please contact Beamex: info@beamex.com.

Svantek Launches SV110 Hand-Held Portable Vibration Calibrator

Ideal for use with Svantek's SV103 and SV106 hand-arm vibration meters

Specialist in noise and vibration instrumentation for occupational health and environmental monitoring, Svantek UK (01234 639551; www.svantek.co.uk) has launched a new portable vibration calibrator. The hand-held SV110 is designed for verification of machine sensors as well as on-site checks of human vibration accelerometers, in accordance to ISO 8041.

Specially developed for in-situ calibration checks of hand-arm vibration meters mounted on hand or tool, the robust SV110 is ideal for use with Svantek's popular SV103 and SV106 instruments.

With its compact design, the SV110 enables easy checks of sensors. Depending on the selected frequency (79.58 Hz and 159.2 Hz), the user may select the level of calibration from 1m/s² to 10m/s². Accelerometers are conveniently attached using mounting stud or disc, or via a dedicated adapter.

The calibrator menu provides selection between both metric systems 'g' and 'm/s²'. The menu is simply operated by three push buttons and small OLED display.

Following the requirements of ISO 8041, the calibrator's built-in reference accelerometer measures the cross-axis (transverse) vibrations to detect any disturbance to the calibration signal. Faults caused by transverse vibrations are indicated by two LEDs on the calibrator's outer casing.

This innovative solution ensures stability of both the calibration level and frequency, independent from the mass of the test object.

Svantek's SV110 portable vibration calibrator boasts built-in rechargeable batteries for 12 hours of continuous operation.



For further product information please contact Svantek on:01234 639551 Or Visit: www.svantek.co.uk



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When launching a new product for use in hazardous locations, two questions often come up: What certifications do I need, and how long will it take to get them? You can't afford to get lost in a maze of complexity. That's why more and more companies are choosing Intertek.

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Understanding Infrared Camera Technical Jargon

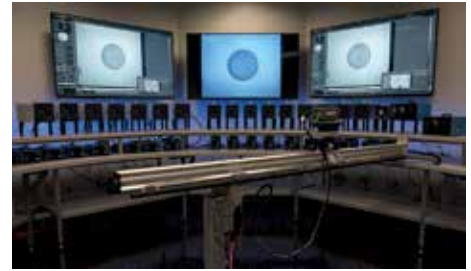
FLIR Systems has published a new paper that looks to strip away the technical jargon terms and explain infrared camera accuracy and measurement uncertainty in plain language.

Often explanations of infrared camera measurement accuracy involve complex terms and jargon that can be confusing and misleading. To trust measurements from infrared cameras when you don't have a clear understanding of how their sensitivity and accuracy is derived means you are unlikely to get the best results.

The authors of the paper explain infrared camera accuracy specifications and introduce the RSS Uncertainty equation. The relevance of these considerations is then related to real laboratory

temperature measurements an infrared camera actually produces when looking at an object of known emissivity and temperature. Further explanation is provided on the importance of ambient temperature compensation and other factors affecting measurement accuracy such as spot size.

The paper concludes that using the uncertainty analysis technique allows infrared camera accuracy to be determined with a 2°C margin of error. However using proper calibration and paying



attention to factors such as ambient temperature, emissivity, and spot size, the authors demonstrate that the margin of error can be reduced to less than 1°C.

For a copy of this paper please visit <http://www.flir.eu/science/blog/details/?ID=74935>.

For further information please contact FLIR Systems on :
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or research@flir.com.

Fortress tGard Interlock Switches and Control Devices Get TÜV SÜD Certification

Industrial safety specialist Fortress Interlocks has achieved TÜV SÜD European, Canadian and U.S. approval for its tGard range of interlock switches and control devices.

This means they meet all the necessary requirements of the European Machinery Directive and the Nationally Recognized Testing Laboratory Program (NRTL) in North America.

tGard is a compact, metal-bodied interlock system that allows the configuration of a wide range of safety products, including electrical safety gate switches (with or without guard locking), mechanical trapped key interlocks and electrical operator controls – either as separate devices or integrated into one device.

Highly versatile, tGard includes selector switches, safety switches (solenoid and non-solenoid), personnel keys (safety keys), emergency release, push buttons, estops, indicator lamps as well as a choice of operating handles for both hinged and sliding guard doors. These elements are simply selected and then assembled into a robust housing which is suitable for mounting onto machine guarding.

All tGard components are quick and easy to install and can be mounted directly onto a flat surface,



doors or extruded aluminium profiles without needing mounting plates or brackets.

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Air Operated Hoists Provide The Safe Solution Whatever The Working Environment

The J D Neuhaus Profi TI range of air operated hoists incorporate many years of design and development, and have successfully proved their versatility and reliability following installations within a wide range of light, medium and heavy duty industrial workplaces.

The major aspect of these hoists is that they have been engineered for extremes and can be safely operated even where hazardous working environments exist. Their compressed air supply, utilised for both power and control functions, does not initiate sparks, so providing an unbeatable advantage when hoists are operating in potentially explosive atmospheres. Even greater safety can be achieved by the prevention of sparks generated by static discharges or metal to metal friction contacts.

Standard versions of JDN hoists and crane systems (which utilise Profi TI hoists for lift operations) have the explosion protection / classifications and markings EX II 2 GD IIA T4 / II 3 GD IIB T4.

Increased spark protection can be achieved, which involves copper galvanisation plating of the hoist bottom block and load hooks, together with fitting brass safety catches to achieve a rating of EX II 2 GD IIB T4.

With even further increased spark protection for explosion group IIC, the hoist horizontal movement trolleys incorporate running wheels and travel gearing which are manufactured in bronze for an impressive EX II 2 GD IIC T4 rating.

The Profi TI hoist range is the workhorse of the industrial and commercial world, providing lift capacities from 250kg up to a full 100 tonnes. The operating air supply can be set at 4 or 6 bar pressure, with a standard load lift height of three metres being provided throughout. Other optional lift height requirements can also be specified and accommodated as required.

All Profi TI hoists are equipped with a top suspension hook, with optional overhead trolleys also available to accommodate lateral movement of suspended loads. Three trolley options incorporate load traverse movements combined with precise load placements. One trolley is manually operated for horizontal movement of the suspended load. A second trolley has a manually operated reel chain mechanism for lateral load movements. The third motorised trolley provides traverse as well as load raise and lower movements utilising compressed air power.

All trolley systems can negotiate overhead rail curvatures, and can also be fitted with rack and pinion drives for safe load handling on offshore platforms and sea going vessels. For installations with overhead space constrictions, a low headroom trolley option is also available, suitable for loads up to six tonne.

The easy to use range of Profi TI hoists are 100% duty rated with unlimited duty cycles, so minimising any downtime conditions. Their compact modern design eliminates any protruding control hoses or similar external parts susceptible to damage, emphasising the suitability of the Profi range for even horizontal pulling. These standard hoists are also insensitive to atmospheric dust or humidity and withstand working temperatures ranging from 20°C to +70°C. Their patented, low maintenance vane motor brake systems ensure fail-safe starting and positive braking, while also being low maintenance as well as suitable for lube-free operation. Various pendant controls can be fitted for sensitive, single speed, multi-function or remote control operation. These design led hoists also provide strong, fast and silent operation combined with high performance,



together with more efficiency and greater reliability to ensure high lifting and lowering speeds while incorporating positive sound absorption.

The compact hoist designs ensure minimum dead-weight together with suitability for installation in conditions of low headroom availability with loads from one tonne upwards also incorporating overload protection.

Hydraulically operated versions of the JDN Profi range can also be made available, together with hoists specifically designated for operation within unique working conditions. These include JDN Profi 25 TI hoists, available with compressed air or hydraulic fluid operation, which are suitable for work undertaken in fully submersed conditions. These subsea hoists provide possibilities of enhanced weightless underwater movements of suspended loads which has included the replacement of a 45 tonne replacement rudder blade for a cargo ship while remaining berthed at sea.

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Only Genuine Viton™ Carries An Authorised Seal To Verify True Quality

Viton™ fluoroelastomer sealing products, available in the UK from Dichtomatik Ltd, have been the first choice of scientists and engineers since the product was introduced by DuPont™ in 1958.

The unique properties and superior performance of this FKM product engender a level of sealing reliability in even the most demanding of industries including automotive, chemical processing and transportation, aircraft and aerospace, oil and gas exploration and production, along with many other industrial production environments including in the food and pharmaceutical industries.

However, some suppliers incorrectly refer to any and all FKM general elastomers as Viton™. These are products not made from 100% virgin Viton™, which all subsequently fall short of the anticipated high performance levels and stringent quality levels set by the genuine Viton™ product.

To guarantee the highest quality FKM products available, users should insist upon 100% virgin Viton™ (manufactured at ISO 9002 registered facilities only) and ensure that the products supplied are identified with "Made With Genuine Viton™" approval seals.

Genuine Viton™ is highly recommended for such qualities as:

- Outstanding resistance to heat, oxidation, weathering and ozone.
- Outstanding resistance to a broad variety of fluids including: aliphatic and aromatic hydrocarbons, halogenated fluids and strong acids.
- Outstanding resistance to compression set, providing sealing performance and a longevity unmatched by any non-fluorinated elastomer.

The heat resistant properties of genuine Viton™ products far outlast nitrile rubber and other general-purpose elastomers. With such reliability, service intervals can be safely extended, helping to stretch maintenance budgets by reducing unscheduled downtime across a wide industrial spectrum. In the aircraft and aerospace market Viton™ has delivered extended sealing properties for jet engines with operating temperatures of 204°C, and even maintaining performance after excursions up to levels of 315°C temperature.

In tough oil and gas downhole applications Viton™ provides protection against seal failure, helping to extend MTBF intervals. While in the automotive industry, Viton™ ensures improved durability of advanced fuel and engine systems even when operating at extreme operating temperatures for fuels, oils, transmission fluids and even acid concentrates. In petroleum refining and transportation there is a wide established use of bonded seals, radial lip seals, caulks, coatings, vibration dampeners, expansion joints, gaskets, 'O' rings, piston seals and custom shapes including stock-rods and sheets. For these diverse requirements, there is a world-wide availability of the true Viton™ products, with the approved supplier for the UK being Dichtomatik Ltd.

These characteristics make Viton™ fluoroelastomer the perfect choice for demanding sealing applications. Unfortunately, there are several low-cost "fluoroelastomer imposters" on the market that may put expensive production operations at risk of seal failure. A number of these finished goods manufacturers offer products which are being described as "commercial" or "industrial grades" of fluoroelastomer at reduced prices.

These so-called "fluoroelastomers" can be offered at lower cost simply because they are not 100% virgin fluoroelastomer. Instead, some of these products are blends of FKM with hydrocarbon elastomers, such as ethylene-propylene, chloroprene or acrylic rubbers. Many hydrocarbon rubbers can be blended to take advantage of specific features inherent in the individual rubbers. Fluoroelastomers in general cannot be blended with hydrocarbon rubber without significantly degrading the resistance of the resulting vulcanizates to heat, fluids and compression set.

Because Viton™ performs better than hydrocarbon rubbers in fluid resistance, blends of other rubbers with Viton™ typically perform significantly poorer than 100% FKM. Blends of Viton™ with hydrocarbon rubbers do not perform "almost like FKM" or anything close to it. Users should beware of the "good deals" on offer. Rather than being a "low-cost fluoroelastomer", blends can instead perform like an over-priced hydrocarbon rubber. If your sealing application is one that is best



handled by a fluoroelastomer, make sure you are getting 100% Viton™ FKM, and not a "low cost" blend of FKM and hydrocarbon rubber. Insist on parts made with Genuine Viton™. Our Genuine Viton™ License Program guarantees the end-user that the elastomer portion of finished goods which bear the Genuine Viton™ Label consist only of 100% virgin Viton™ fluoroelastomer.

It is recommended that potential users always provide full detailed material specifications to their potential supplier. Specifications that are insufficient, inaccurate or that allow substitutions may lead to quality and performance problems. However, a well-written specification that identifies the type of material and quantifies the critical performance parameters of the desired seal will communicate to suppliers the most cost-effective FKM for the application in hand. When Viton™ is specified, product performance may be enhanced since the correct type of Viton™ has been tailored for your application needs.

These types or "families" of Viton™ enable selection of the most cost-effective elastomer. Each family affords a tailored balance of mechanical properties, as well as specific resistance to various types of process fluids.

Further information is available from:
Dichtomatik Ltd, Donington House, Riverside
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A schematic showing a typical Central Vacuum Cleaning System
systems. They provide vacuum connection points for cleaning
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Dialight Introduces High Efficiency Zone 1 SafeSite® High Bay

New Certification Allows for Use in New Hazardous Environments in Europe, Middle East, and Australia

Farmingdale, NJ (June 8, 2016) – Dialight (LSE: DIA.L), the global leader in LED lighting technology, today unveiled the first-ever High Efficiency ATEX/IECEX Zone 1 SafeSite® High Bay. Each high bay feature Dialight's latest world class in-house designed power supply and a full 10-year, full performance warranty and up to 110 lm/W efficiency.

The high output 23,500 to 9,650 lumen SafeSite ATEX/IECEX Zone 1 High Bays offer superior illumination and efficiency for oil, gas, chemical,

petrochemical, pharmaceutical and other hazardous area applications. The ATEX Zone 1 certified SafeSite High Bays include an integrated power supply with 6kV surge protection, and their light weight and low profile makes for easy installation. Options for 3 meter cable or integrated wiring junction box. With typical mounting heights up to 13 meters, the SafeSite LED High Bays represents the ideal retrofit for conventional 400W HID fixtures. The ATEX/IECEX SafeSite LED High Bays are L70 lifetime rated for more than 150,000 hours and operates in temperatures ranging from -40oC to +60oC.



For more information about Dialight's complete line of SafeSite LED lighting solutions for hazardous locations including IES files, LM79 reports and technical datasheets, visit www.dialight.com. Or call: +44 (0)1638 665161

Svantek Gets Ready For Summer With 15% Discount On Its Range Of Noise And Vibration Dosimeters

Svantek UK has announced its summer promotion. Until September 2016, the Bedford-based business is offering 15% discount on its range of noise and vibration dosimeters for occupational health and safety monitoring, including the SV104 personal noise meter and SV103 personal vibration meter.

Svantek's SV104 is the world's first personal noise meter to offer octave band analysis for helping to select hearing protection, full audio recording and a colour OLED screen that displays information in both text and graphical form. The cable-free instrument is easily attached to the operator's shoulder, close to the ear using assorted mounting clips.

It also incorporates a virtually indestructible MEMS microphone enabling easy calibration and integrated tri-axial accelerometer for vibration shock detection. Measurement data is safely stored in the large eight GB memory and it is powered using built-in

rechargeable batteries or through the USB interface which also enables easy connection between the SV104 and a PC.

The world's first personal vibration dosimeter to accurately measure the vibration dose received by the operator, Svantek's SV103 is the only instrument on the market to take into account grip/contact force which greatly reduces measurement uncertainty.

The small, rugged SV103 easily attaches to the user's arm while the lightweight MEMS



accelerometer straps to the hand. The instrument also features a colour OLED screen and data can be quickly downloaded to a PC for analysis and easy reporting.

For further product information please contact Svantek on:01234 639551 Or Visit: www.svantek.co.uk



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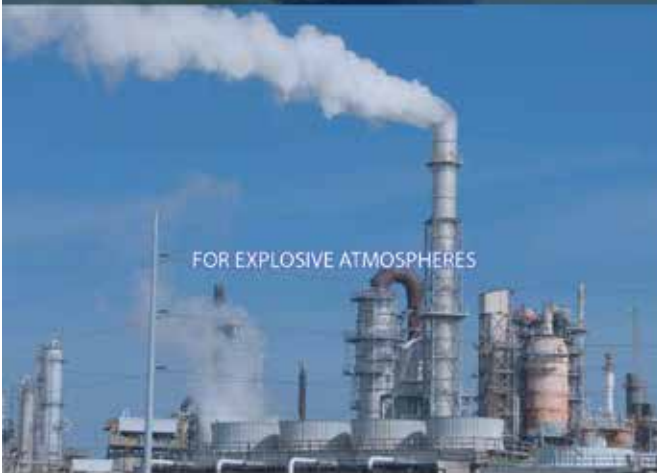


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New Wolf Safety ATEX LED Inspection Leadlamp Cable-Powered, Versatile, Lightweight, Handheld, Impressive Light

Wolf Safety, the world's leading manufacturer of hazardous area portable and temporary lighting, announces the launch of the ATEX LED Inspection Leadlamp SP-600, an ATEX and IECEx certified cable-powered, versatile and lightweight handheld light with impressive LED light output, ideal for inspection and work activities in potentially explosive gas and dust atmospheres.



Providing optimum illumination for localised, close proximity work by hazardous area workers, the SP-600's high power LED 'fitted for life' light source produces a forward facing high efficiency output of up to 470 lumens by emitting an exceptional, even, ultra-wide angle light; minimising shadows and enhancing visibility. The large diffused light source also minimises eye discomfort when viewed directly by a hazardous area worker.

Lightweight, compact and ergonomically friendly, the ATEX LED Inspection Leadlamp is designed for handheld use, with an "easy-grip" handle for user comfort. With a flexible 360° swivel hook, the SP-600 can be suspended for hands-free use, and using a magnet securely positioned on a ferrous metal surface; putting the ATEX LED Inspection Leadlamp exactly where it is needed.

Alex Jackson, Managing Director, Wolf Safety comments "Wolf never underestimate the rigours of heavy industrial equipment use and the extreme conditions encountered by end users in hazardous areas and our new SP-600 is built for longevity and

to maximise worker uptime and efficiencies. The new ATEX LED Inspection Leadlamp is extremely durable and tough, built to withstand knocks and drops as continually moved around and fully impact tested beyond certification requirement; with impact resistant anti-static enclosure, IP67 rating, and scratch and chemical resistant polycarbonate hardcoat lens."

Further protection is possible by fitting a stainless steel cage guard for enhanced mechanical protection to ensure the ATEX LED Inspection Leadlamp's longevity in harsh working conditions. When used regularly in coating and painting applications, a disposable protective sleeve is available to minimise residue build-up in dirty or paint-filled atmospheres, ensuring the SP-600 is always clean and delivering maximum light output without obstructions from dirt and debris on the lens.

The cable-powered ATEX LED Inspection Leadlamp is fitted with 10m HOFR cable as standard and available in three voltage input ranges: high voltage



90-264VAC for general applications, and low 18-54VAC/20-54VDC and extra low 9-16VAC/DC voltages for use in confined space applications, such as metal tanks.

All ATEX LED Inspection Leadlamps are CE marked to the ATEX Directive and IECEx certified safe for use in Zone 1 potentially explosive gas atmospheres, where a T4 temperature class permits, and Zone 21 potentially explosive dust atmospheres, with a maximum surface temperature of 95°C, as well as Group I mining applications.

Please visit www.wolf-safety.co.uk for detailed technical information.

Geoambient Chooses Ion Science Tiger Voc Detector For Humidity Resistant Sensor

Spanish geological and environmental consultancy, GeoAmbient, is using a Tiger PID (photoionisation detector) from Ion Science (www.ionscience.com) – leading specialist in gas detection instrumentation for occupational health and the environment – as part of its subsoil investigation activities.

Chosen for its humidity resistant, ATEX accredited MiniPID sensor, the high performance, handheld VOC (volatile organic compound) detector is being used across outdoor sites, on a year round basis.

Barcelona-based GeoAmbient conducts subsoil investigation, remediation of polluted sites, waste management and technical assessment. The company is using the cost effective Ion Science Tiger VOC detector instrument across one or two field campaigns per month, with each project taking between two and five days. The data is recorded manually by its technical teams.

Albert Sabanès i Fiter, Director de projectes, GeoAmbient comments: "At GeoAmbient, we keep updated on the latest technical developments for our industry through regular communication with suppliers, the internet and by maintaining professional relationships. As a result of this on-going research we became aware of the benefits offered

by the Ion Science Tiger system, including its very good, market-leading MiniPID sensor.

"We conduct subsoil investigation so it is very important to have in situ information of polluted soils to help us decide the best place to take a sample. Our technical teams work on outdoor sites during all weather conditions so the Tiger's humidity resistant sensor was the most important feature for our business. Of course, the anti-contamination design was also vital to avoid cross pollution and ensure data integrity.

The instrument incorporates Ion Science's well proven MiniPID. This simple plug and play sensor has been specially developed to deliver a dynamic and reliable response to thousands of VOCs. Designed for rapid, accurate detection, with an unrivalled response time of just two seconds, and the widest measurement range of one part per billion (ppb) to 20,000 parts per million (ppm)*, the robust Tiger is ready to use, straight out of the box, and extremely simple to set up.

It offers worldwide Intrinsic Safety (IS) certification, making it suitable for use in potentially explosive, hazardous environments, and also meets ATEX, IECEx, UL and CSA standards.

The Tiger has been designed for use with long life rechargeable Li-ion batteries that give up to 24 hours usage and offer fast battery charging. Plus, inexpensive disposable parts such as filters and lamps are easy to change, minimising downtime. Simple connectivity to a PC via the USB allows data to be downloaded quickly.

Albert concludes: "So far, I can report that the Tiger is easy to use with high levels of accuracy. It is too early to comment on the calibration and maintenance but initial feedback is positive."

Independently verified as being the industry's best performing PID, the Tiger provided the most stable, repeatable readings, when tested against competing instruments in humid and contaminated conditions.



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 mail: marketing@ionscience.com

Nederman Introduces Most Flexible Dust Collector Ever

To ensure a perfect fit into virtually any manufacturing application that generates dust, smoke or fumes, Nederman has now introduced its new L-series, a modular and fully configurable dust collector.

In manufacturing facilities where dust, smoke or fume is generated during the production process, the primary objectives are to create a safe working environment for the workforce whilst achieving low emissions to atmosphere, to meet increasingly stringent environmental and health and safety regulations. Since no two facilities are the same, Nederman has designed its new L-series dust collectors, to be fully flexible and configurable to match a wide range of needs in the collection and recycling of dust, smoke and fumes.

How we create the Perfect Fit

The core of any dust collector is the filter media. The Nederman L-series dust collector offers a wide portfolio of filter media in bag or cartridge format, which ensures that performance and filter life is optimised, whatever the contaminant. After selection of the correct filter media, the dust collector is configured to match the required airflow and application characteristics. The L series is modular and assembled from a limited set of stocked panels. This panel stocking enables Nederman to offer very low lead times for all the range, with some standard pre-configured filters available in just two working weeks!

Flexible, efficient and future-proof

Nederman's wide expertise in extraction as well as collection of dust, smoke and fumes helps ensure not only a perfect fit, but also efficiency and a future-

proof solution. The new L-series can be expanded to adapt to future process changes or new regulations. New filter modules can easily be added whenever increased filter capacity is required.

Low total cost of ownership

The L-series offers low total cost of ownership due to low power consumption, minimum maintenance needs and extended filter lifetime. It can be supplied either pre-assembled or be fully built on-site, for those occasions where access requirements prohibit the installation of an assembled filter. This may also generate considerable savings on shipment costs. The Nederman L-series is available in ATEX compliant configurations for safe handling of combustible dusts, as well as with a variety of ancillary components and equipment for configuring the dust collector and system to match all of your facilities operation and maintenance needs. These options include pyramid or trough type hoppers, a no-hopper venting version, dust discharge valves, dust storage bins with 50 or 100L capacity, integral or floor mounted fans and fan silencers.

Wide range of applications

The portfolio of filter media options and configurations available makes the L-series suitable for a wide variety of applications, including crusher extraction, spray dryers, foundries, mixers, grinders, kilns, welding, plasma cutting, shot blasting, thermal



spraying, biomass, mining, metallurgical, food and pharmaceutical processes.

Unlimited capacity

Nederman has built the L Series to be suitable for rigorous environments and applications. It is robust, resilient and weatherproof, and whilst the modular method of construction makes the air flow capacity virtually unlimited, there are standard sizes which cater for flows of approximately 5,000 to 300,000m³/hr, dependent on the application and the media selected.

For more details on how Nederman can clean up your work environment, please contact your local Nederman representative on Tel: 08452 743434.

Nederman 'At-Source' Extraction

The Nederman Fume Eliminator 840/841 is a small, lightweight, portable extraction unit that has proven invaluable in improving the air quality of workshops where light welding is carried out. Ideal for a diverse range of workshop demands, the Fume Eliminator is the epitome of a flexible working solution.

The Nederman FE840 model is provided with a manual start/stop function, whereas the FE841 includes an innovative automatic start/stop feature that starts and stops the extraction with operation of the welding torch. By eliminating welding fume at source, via either on torch extraction or extraction nozzle, the Fume Eliminator with its integral 99.7% efficient filtration is undoubtedly the most cost effective means of reducing airborne particulate. Furthermore, the automatic feature on the 841 Series ensures that extraction is only used when required, thereby improving efficiency and reducing running costs for the end user.

This efficiency is also incorporated into the Fume Eliminator design, with a powerful 100W motor that

creates an airflow of up to 150m³/h and a maximum suction of 22kPa through the 2.5m long hose, and to permit the welding operative to freely move the Fume Eliminator from one work area to the next, it has an extremely lightweight design with a total weight of 16kg. This is packed into an 830 by 230 by 410mm (L X W X H) frame that allows the unit to be used in the most compact and demanding of work areas.

To cater for the various demands of the workplace, the Fume Eliminator is available with three optional nozzles. The TM80 nozzle has a 500mm length with an 80mm diameter hose whereas the TM200 is supplied with a 570mm hose length with a slot nozzle that is 200mm wide and 30mm high. The



final nozzle option is the PM300. This provides a slot width of 300mm and a slot height of 5mm, making this nozzle the preferred choice for seam welding applications. For further details on the Fume Eliminator, please contact your local Nederman representative.

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New Developments for ambitious Valve Manufacturers Bifold as they launch their new initiative

Bifold Store is one of Bifold Group's newest initiatives, incorporating their preferred range products with the emerging online market and the global acceleration of e-commerce.



Visit: store.bifold.co.uk

The preferred range includes a variety of the valves which Bifold Group provides with 48hr despatch.

The range includes:

Ball and Needle Valves, Check and Exhaust Valves, Flow and Volume Valves, Pilot and Mechanical Valves, Solenoid Valves and Medium Pressure Valves.

Bifold Store is a way in which Bifold can offer a selection of products to you online, therefore creating a much more accessible and easy service.

The Bifold Store has filter services such as 'type of valve' and 'price range' to make it easier to distinguish and locate products and navigate around the store.

The Bifold Store is an easy way to access the products that are available via 48hr despatch time. The features on the web page make sure to spotlight popular products using a 'Popular Categories' section wherein customers can easily select products which are regularly bought. The

Bifold Store also includes product images and descriptions along with their operational schematics in order to make product identification much quicker.

The Bifold Store website also has easily identifiable tabs of the separate product ranges, again making navigation and accessibility around the online store easy and efficient.

Accessibility is extended further via the various devices that the Bifold Store website has been made available to. Customers can access the website through a multitude of devices, including tablets, phones and computers. This means that products can be ordered in cohesion with the immediacy of the customer demand.

There are over 500 products available in the Bifold Store's growing catalogue, featuring a comprehensive selection of products from across the entire Bifold range.

Once a customer becomes a regular buyer, they will acquire an account and purchase history which will

be found under 'My Account'. In this, customers can view their previous orders, current orders and can re-order the same items again without going through the basket process.

All of the products on the Bifold Store are despatched within 48 hours from the point of order, incorporating Bifold's new '48 Hour Despatch' initiative. This has been successful within the Bifold sales department and so implementing it on the Bifold Store will have the same effect in terms of efficiency. This again improves the accessibility of the products to the customers in conjunction with the other features of the website.

If you are interested in the Bifold Store initiative, please visit store.bifold.co.uk for further details and terms and conditions. You can also contact Bifold using the information below.

Bifold are dedicated to maintaining the excellence of their products and their new facility confirms their commitment to shortening lead times and meeting customer demands.

Bifold Group would like to take this opportunity to thank all their customers for their continued support.

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SpaceVac releases world's first ATEX approved cleaning system

SpaceVac is celebrating a major world-first: its range of high-level cleaning systems has become the first cleaning system of its kind, anywhere in the world, to be certified for use within ATEX explosive atmospheres.

This exciting opportunity represents a major coup for the company – consolidating its position as the market leader for high-level cleaning systems.

Explosive atmospheres can be caused when flammable gases, mists, vapours or combustible dusts build up in confined spaces. If there is enough of the substance, mixed with air, then all is needed, is a source of ignition to cause an explosion. The consequences – as seen at the Bosely Mill disaster in 2015 – can be dire, and it is with safety at heart that the SpaceVac team began developing the groundbreaking ATEX system

The SpaceVac ATEX system (which has been granted a worldwide patent) has been certified for

use in explosive atmospheres after independent tests found that the system was completely conductive. This means that everything from the anti-static brushes and accessories and carbon-fibre poles, through to the high-powered wet and dry vacuum units, are guaranteed not to spark.

The system can be used in both M Class and H Class dust and ATEX Zones 1,2, 21 & 22 explosive dust environments – a first for any high-level cleaning system. This is achieved using brushless long life ignition-source-free EC motors and a built-in Flow Sensor that monitors air speed in the suction hose to make sure that it does not go below the minimum 20 m/s ATEX requirement.



SpaceVac Managing Director Colin Lewis said: "After years of continuous R&D on our products, we are very proud that the SpaceVac system is now the first system in the world to be certified as safe within ATEX atmospheres. Clearly for our customers, the welfare and safety of their employees is paramount and with this in mind, we are tremendously excited to be launching the ATEX range to the world."

Find out more at www.space-vac.co.uk

Infrared Camera for Industrial & Academic Research

The FLIR SC7000 Series is specifically designed for academic and industrial research applications that require a flexible thermal imaging camera with high sensitivity, accuracy, spatial resolution, and speed at an affordable cost.

Designed to address any application in single and multispectral analysis, FLIR SC7000 Series cameras offer researchers a choice between mid-infrared Indium Antimonide (InSb) as well as mid-infrared and longwave infrared Mercury Cadmium Telluride (MCT) detectors. In addition the FLIR SC7000 series comes standard with a removable, motorized 4 position filter wheel enabling high performance imaging of events in a select part of the electromagnetic spectrum.

The SC7000 series can produce high quality infrared imagery in 640 x 512 or 325 x 256 pixel formats with high sensitivity and noise levels as low as 20 mK. Windowing allows a subset of the total acquired image to be selected with user adjustable window size at frame rate speeds of up to 62,000 Hz. Camera integration time on the SC7000 Series is adjustable in nanosecond increments. This smart external triggering feature allows synchronization of

the image capture to the most fleeting events.

Benefiting from FLIR's proprietary Hypercal™ technology, SC7000 series cameras are able to ensure the most accurate temperature measurement with the highest sensitivity. Simply set the desired lower and upper temperature limits and the camera will automatically adjust to the appropriate integration (exposure) time.

Leveraging FLIR unique Superframing technique enables SC7000 Series camera users to sequentially acquire thermal data from up to four user-defined temperature ranges, and then merges those streams into a single real-time video that spans all four temperature ranges, effectively extending dynamic range from 14-bit to 16-bit.

CNUC is a proprietary FLIR calibration process that provides unmatched high quality imagery and



measurement stability on SC7000 Series thermal imaging cameras. CNUC allows flexible integration time adjustments without the need to perform non-uniformity corrections. CNUC calibration also produces accurate measurement stability regardless of camera exposure to environment variations.

The FLIR SC7000 Series thermal imaging camera works seamlessly together with FLIR ResearchIR Max software enabling intuitive viewing, recording and advanced processing of the thermal data provided by the camera.

For further information on the FLIR SC7000 Series visit:
www.flir.eu/science/display/?id=50093
or contact FLIR Systems at:
research@flir.com / +32-3665-5100.

Continually Evolving SIL Relay Range to be complemented by a New GMI Surge Protection Units This Autumn

Exloc Instruments UK Ltd are the sole UK distributor of GM International products who continue to expand their range of SIL certified relays and switch repeaters designed and engineered to meet the requirements of modern niche projects.



This Autumn we will also be introducing the new range of DIN rail mounted and field mounted surge protectors from GMI which will protect 4-20mA HART, Digital I/O, World FIP and Fire & Gas signals and we hope to expand on that in the next issue.

Both modules also provide full Load & Line Internal Diagnostics: load voltage and current, load resistance (patented), leakage from load to earth, coil integrity and internal faults. Moreover, MODBUS communication allows the units to be remotely interrogated and configured.

Meanwhile, the switching of Safety-Related circuits demands the use of specific SIL certified Relay Output modules, capable of delivering the highest rate of availability and functional safety. The original SIL relay by GM International was the D5293S, a relay output with a normally energised load and with load and line diagnostics which achieves SIL3 according to IEC61508:2010 Ed.2.

Hardware is SIL 3 certified, while diagnostic functions are now also SIL 2 certified by TUV: they remain two independent features, which can be used separately or together.

The D5294S and D5295S modules are both 4Amp modules (normally open and normally closed contacts respectively) which again achieve SIL3 and are suitable for Normally Energised or Fire & Gas /Normally De-energised load with open/short circuit diagnostics.

All models are ATEX, IECEx and SIL certified and are suitable for installation in Zone 2 / Div. 2 Hazardous locations.

The range of GM International modules which are SIL capable continues to expand and also includes the single channel D5093S and dual channel D5093D Loop Powered Switch Repeaters. These modules operate at 24 to 220 Vac/Vdc and are suitable for safety

related system applications requiring SIL 3 in high risk industries.

Each channel is able to reflect the presence of a 24 to 220 Vac/Vdc input signal to the output by closing an optically coupled Normally Open open-drain transistor (solid-state relay, MOSFET output). Mounting of the units can be via standard DIN-Rail or on customized Termination Boards, in Safe Area or in Zone 2, group IIC T4. All models are ATEX, IECEx and SIL certified.

Call us on 01457 239301 / 07557 371373 or e-mail sales@exloc.co.uk for further details.



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- IECEX QAR Services.



Information:

Our web site contains lots of useful information, including links to relevant ATEX and IECEX documents, for example the history of the harmonisation status of major standards

Advice:

Our customers value our unbiased advice on how the standards apply to their particular product or service. With seven individuals directly involved in the writing of Ex related standards, and with over 300 years' total Ex experience in the company, no other certification body in the world can place more knowledge at your disposal.

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BEKO TECHNOLOGIES can measure to ISO standards 8573-1 class 1

BEKO TECHNOLOGIES can now measure compressed air to ISO 8573-1 class 1 of the ISO standards.

This is extremely important for industries such as food & beverage, pharmaceutical, medical, automotive and many more. BEKO TECHNOLOGIES have a portable test rig which comprises of the following four components:-

- METPOINT OCV system for the measurement of hydrocarbon levels down to 0.003 mg/m³, which allows for accurate measurement well below the class 1 standard of less than 0.01 mg/m³.
- The METPOINT dewpoint sensor capable of reading down to -100c pdp which is also well below the class 1 for Moisture of -70c.
- METPOINT BDL an innovative graphic display for the recording of the parameters for compressed air and gas applications.

- Lastly we have a laser particle counter. This measures at 0.1, 0.5, and 1 micron particle sizes as per the ISO 8573 requirement, which allows the compressed air particulate contamination to be measured and classified as low as class 1 particulate.

How it works: The Portable Tester is connected into the customers compressed air supply. The level of filtration and drying is then checked and confirmed that it has been sized to achieve a minimum of class 3 for particulate, class 4 for moisture and class 2 for hydrocarbons. This is done to ensure the unit is not contaminated. We then run the portable tester for a minimum of 1 hour, at a flow rate of a minimum of 1 m³/min, this allows the METPOINT OCV to get up to temperature, the dewpoint sensor to dry down, and the particle counter to purge itself and the pipework.



Once the readings are stabilised, they are fed into the METPOINT BDL data logger then are recorded on a comprehensive test data sheet with classification findings. The results are then given to the customer with recommendations.

Tel: 01527 575778
 email info@beko-technologies.co.uk
 www.beko-technologies.co.uk

New generation of DRYPOINT AC compressed air adsorption dryers from BEKO TECHNOLOGIES

In May 2016, BEKO TECHNOLOGIES launched the latest generation of the DRYPOINT AC compressed air adsorption dryers.

These models come in 10 different sizes for volumetric flow rates from 100 to 1000 m³/h and operating pressures from 4 to 16 bar (gauge). The cold-regenerated adsorption dryers extract moisture from the compressed air to a pressure dew point of -40° C.

The cold-regenerated DRYPOINT AC adsorption dryers ensure a continuous supply of high-quality air. They are equipped with an efficient compressor synchronisation controller as standard, saving energy. If the compressor is not running, the dryer is also shut down, preventing unnecessary air purging.

The containers of the DRYPOINT AC are filled with activated alumina desiccant. The innovative shuttle valve with an internal purge air line allows for an adequate air flow even in the event of a power failure, making the system fail-safe. Sturdy galvanised press fittings, easy transport by means

of a lift truck and access to all system components show that the unit has been designed with practicability in mind. The regeneration air flow is determined by the operating pressure and cannot be adjusted. The regeneration air is released through top quality silencers to the ambient air.

The dryer is shipped with a fully mounted CLEARPOINT prefilter to remove solid and liquid contaminants. The CLEARPOINT afterfilter ensures that the downstream compressed air system cannot become contaminated with desiccant abrasion residue. The condensate is drained off through a BEKOMAT. By combining these tried and tested compressed air processing devices into a single unit, BEKO TECHNOLOGIES demonstrates once more its technological expertise that has made the company a leading compressed air technology supplier. Like all BEKO TECHNOLOGIES products, the DRYPOINT AC is easy to operate.

The new standard models of the DRYPOINT AC range will be available from May 2016.

Apart from the standard models, the dryer can be customised for pressure dew points of as low as -70° C. For such units, the air is dried by molecular sieves. The DRYPOINT AC can be upgraded with a pressure dew point control system that includes METPOINT sensor technology from BEKO TECHNOLOGIES, reducing energy consumption even further.



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Marechal Crimp-fit Multicontact



Save space and installation time with crimp-fit multi-contact DECONTACTOR™

The introduction of crimp-fit connections on MARECHAL's multi-contact DECONTACTOR™ enables fast and easy installation combined with the flexibility to integrate electrical power, signal and data cables in a single housing. This means that a wide range of industries can cut installation time and reduce the number and size of electrical sockets in addition to enhancing electrical safety.

Flexibility for each installation

Available in virtually any combination of up to 37 contacts in a single housing, crimp-fit DECONTACTOR™ plugs and sockets are now offered on MARECHAL's compact and watertight DSN connectors as well as the industrial-grade DS 37C and ATEX series. These provide fast crimp-fit connection for virtually any application rated at 10A, 25A, 30A and up to 415V/500V.

A wide range of options means that specifying engineers can use the inherent flexibility and compactness of the DECONTACTOR™ to exactly match the mechanical and electrical parameters of each installation in the smallest possible space.

Patented safety technology

Each DECONTACTOR™ features MARECHAL's patented technology which ensures safe disconnection with a single press of the quick-release button. This button activates an internal load-break switch which disconnects and isolates the power in a single action, while the cable is under load.

The speed and simplicity of connecting and disconnecting DECONTACTOR™ enhances safety by providing operators with visible isolation as soon as the socket release latch is pressed upon. A conditional short-circuit rating of up to 100kA, withstand and close-on, also provides additional peace of mind for operators and for the specifying engineer.

Cutting maintenance costs

Replacing hard-wired connections with the DECONTACTOR™'s simple, quick-release button also helps to reduce operating costs. With their safe and easy one-touch operation, DECONTACTOR™ eliminate the cost and time of waiting for a qualified engineer to disconnect and reconnect equipment

for cleaning, routine maintenance or repair. This can significantly reduce the turn-round time and cost of servicing and cleaning equipment as well as reducing downtime for repairs.

Long-term reliability

Robust housings and silver butt contacts mean that MARECHAL DECONTACTOR™ are able to resist corrosion and vibrations resulting in excellent long-term electrical performance and high endurance of over 2000 mating cycles. All crimp-fit DECONTACTOR™ offer automatic IP sealing to IP66/IP67 immediately on connection and disconnection and provide resistance to shock rated at IK08 with the poly casing, or IK09 with the metal casing.

This high level of robustness means that DECONTACTOR™ are already used extensively in applications such as food and drinks processing, shipping, chemical and heavy industries, water treatment plants and the oil and gas industry.

DECONTACTOR™ plugs save space, cost and time

The combination of crimp-fit connections and patented technology means that MARECHAL DECONTACTOR™ save time and space during installation and continue to reduce maintenance costs whilst ensuring the highest levels of electrical safety.

www.marechal.com

Light Decontamination System from Scott Safety achieves an industry first at Safety & Health Expo 2016

A new portable airborne and surface decontamination solution from Scott Safety (Stand R2000) will debut at Safety & Health Expo 2016 (21st – 23rd June 2016, ExCeL London), achieving a health & safety industry first – decontamination of chemical, biological and radiological vapours, liquids and particles simultaneously in as little as five minutes.



In validation trials, the system decontaminated anthrax by 99.999999 percent from a 100m³ space, in under five minutes.

Cleverly divided into five distinct sections; decontamination, general industry, industrial fire/marine, petrol, oil and gas, and head and sensory, Scott Safety's stand is a must-attend for all health and safety professionals keen to procure new solutions. Over 70 products will be on show, with Scott Safety's team of experts on hand to make recommendations.

Visitors heading over to Safety & Health Expo's popular fashion show will not only get to see the new products worn and demonstrated as part of a modern dance act, but will also get to meet the Scott Safety Superheroes – championing the true heroes of the industry.

At only 22 kg, the Light Decontamination System is the lightest portable decontamination system in its class, enabling safety professionals to work effectively in both confined and remote environments.

The solution can decontaminate environments as large as 500m³ and can be used in a multitude of scenarios - from decontamination of re-useable equipment e.g. respirators, breathing apparatus, gas detectors and non-disposable PPE such as coveralls and footwear, to commercial disinfection for healthcare, agriculture and animal husbandry, buildings and public spaces and end of production cleaning and disinfection e.g. in food and beverage industries.

The Light Decontamination System utilises new Scott Safety atomisation technology to create a fine mist to ensure even and consistent coverage

and haptic dry surfaces. Unlike many traditional decontamination systems which utilise liquids, this new process forces powders to behave like a gas, ensuring that sensitive and electronic equipment is not damaged.

Another solution set to showcase at the event is Duraflow - a lightweight and ergonomically designed Powered Air Respirator with sophisticated real-time air flow control technology. The new solution gives complete wearer assurance of respiratory protection to focus on the job rather than the protective equipment itself, in a multitude of hazardous situations and industries.

Duraflow's automatic monitoring features ensure the airflow rate is maintained at precisely the correct level to afford protection for the user. Visual and audible diagnostics alert the user of any drop in airflow below the required level or when the battery needs re-charging. 2 high energy density battery options are available –standard and extended duration which can be selected depending on shift coverage required- less downtime more working time.

Duraflow will help employers meet the needs of workers across all demographics- with its low respiratory burden and compatibility with facial hair and spectacles. Highly versatile, Duraflow is compatible with a plethora of Scott Safety headtops, filters and accessories, protecting workers from a variety of environmental hazards.

For further information, please visit Scott Safety's stand R2000 or visit the web site at www.scottsafety.com/emea.

Arco's first ever full range of women's hi-vis hazardwear debuts on Safety & Health Expo's catwalk

Arco – the UK's leading safety company - is set to debut the industry's first ever full range of women's hi-vis hazardwear at Safety & Health Expo 2016 (stand M2050-M2100).

Models will take to the runway donning garments specifically contoured to both fit the female form, and keep women safe at work with meticulously specified and placed reflective bands around the chest, arms or legs.

Visitors to Arco's stand will discover the company's latest advancements in safety services, such as specialist mortal risk areas including working at height and confined spaces. The company's award-winning mobile confined spaces training unit will also be on the stand, and experts will be on hand to answer questions and offer advice.

Arco is the first safety distributor to have its own, in-house, UKAS and SATRA independently accredited Product Assurance Laboratory. Recent testing has shown that some of the products that you assume to be safe may not actually be fit for purpose. Arco's quality experts will be on the stand to provide advice and information for visitors. For those keen to hear more, Arco's Marketing Director, Adam Young, will be putting quality and assurance in the spotlight, highlighting the topical issue of Personal Protective Equipment (PPE) standards in the BOHS forum on Thursday 23rd June.



Other safety specialisms, such as hazard control, safety compliance, face-fit testing, and industrial skincare will be showcased.

For further information about Arco, visit: www.arco.co.uk.

Bifold Announce the Launch of Its Newest Initiative the **Bifold Store**

- Visit Bifold Store at store.bifold.co.uk.
- The preferred range includes a variety of the valves that are available on 48hr despatch. The range includes:
 - Ball and Needle Valves
 - Check and Exhaust Valves
 - Flow and Volume Valves
 - Pilot and Mechanical Valves
 - Solenoid Valves
 - Medium Pressure Valves
- Ease of navigation and product selection.
- Locate your product in 2 - 3 clicks.
- Viewable on a range of platforms including tablets, phones and computers.

store.bifold.co.uk

Bifold Store is one of Bifold Group's newest initiatives, incorporating their preferred range products with the emerging online market and the global acceleration of e-commerce. The Store is a way in which Bifold can offer a selection of products to you online and therefore creating a much more accessible and easy service.

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To Prime Or Not To Prime – That Is The Question.

Why are surface primers and conditioners necessary?



With a vast array of different surface primers available, it can become difficult to understand exactly why they should be used and what is actually achieved when they are used. Essentially, primers, sometimes known as surface conditioners, are undercoats which are used to enhance the performance and longevity of the top coating with which they are used.

Protective coatings

Coatings are engineered to withstand certain environmental forces, including erosion, corrosion, impact, abrasion, weathering and immersion in liquids. In order to achieve these physical properties, the formulation of each coating must be finely balanced and engineered to protect the underlying substrate from attack for an economical length of time.

Above: From concrete preparation to roofing, surface primers play an integral role

However, adjusting the formulation to enhance one desired property may have an undesired effect on another characteristic. For example, adjusting the adhesion of a coating could negatively impact on the most important quality of corrosion resistance. Consequently, the right balance of physical properties is critical to the performance. Therefore, surface primers and conditioners can be used to optimise the coating's existing characteristics without affecting other physical properties.

Surface primer functions

Surface primers are used in conjunction with many Belzona materials and fulfil numerous functions, including:

Adhesion

The most important function of a primer is to enhance adhesion between the substrate and the surface coating. The primer itself, as a result of its formulation, penetrates and bonds to the substrate, whilst at the same time providing an optimised bond to the surface coating.

"Wet-out"

When using a very fast-curing or very viscous top coat, it may be impossible to ensure that this material can "wet out" the surface adequately enough to ensure an optimum bond. More to the point, it is difficult to force the coating into the surface profile, thus displacing any air and ensuring a strong mechanical bond. This situation can be avoided by using a low viscosity surface primer to penetrate the profile fully and present an active surface for the top coat to bond with.



Above: Rubber tyre treated with a Belzona surface primer prior to repair



Inert surfaces

Non-porous or inactive substrates such as rubbers and plastics may benefit from the application of a low viscosity primer. Primers contain solvents which attack the substrate and penetrate the inert surface. The primer then bonds with the substrate and presents an active surface for the top coat to bond with.

Coverage rate

Alternatively, substrates which are particularly rough, such as concrete, may result in an uneconomical reduction of the coverage rate of an expensive top coat. In these circumstances, a less expensive, viscous surface primer could be used to smooth off the surface and maximise the coverage rate of the top coat.

Above: Surface primer applied to concrete tank base before sealing

Porosity

Similarly, if the substrate is very porous (e.g. concrete), a surface primer may be prescribed in order to seal the porous surface and prevent the top coat from being absorbed. This will again maximise the coverage rate of the top coat. The use of a primer may also reduce the effects of outgassing, although this should not be considered as a reason to ignore proper application temperature control. Coatings should be applied during the cooling cycle of the substrate, not the heating cycle.

Below: The importance of surface primers and conditioners are often overlooked in applications



Corrosion protection

Some primers, for use on steel surfaces, contain metallic fillers (zinc) which will provide some corrosion protection should the top coat become damaged. These primers are generally known as sacrificial or inhibitive primers.

Bleed through

Primarily used on wood, but also effective on bituminous surfaces, these primers are formulated to prevent stains, knots, wood tannins and natural oils from bleeding through, causing blistering and a loss in the coating's adhesion.

"Tack coats"

Trowelable polymeric screeds for concrete resurfacing are highly filled and therefore lean on excess binder. These screeds require a primer or "tack coat" to enable them to be physically applied to the substrate. Without such a primer they will not grab the substrate and will simply slide over the surface.

Dependent upon the formulation, surface primers are used in different ways. Some must be touch-dry before the application of a top coat, whereas others can be worked "wet on wet". However, all surface primers will have a recommended, time-sensitive, overcoat window which should be adhered to.

In addition, primers can be formulated from many chemical groups, such as oil-based, water-based, acrylic, epoxy and urethane, for use on many different substrates. Therefore, it is important to ensure the correct surface primer is matched with the application and always read the manufacturer's application guidelines and instructions beforehand.

Written by Tom Belli,
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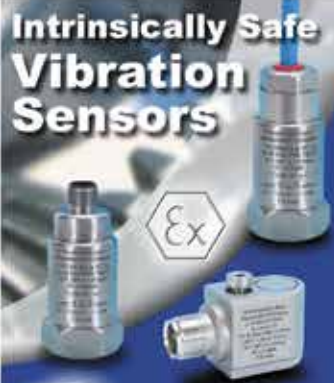
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