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Product focus

HUB™

Asphalt Plant, Concrete Batching and Products

June 2012

Road Construction Project Keeps Mobilisation Costs to a Minimum

Bardon Composite Pavements have recently completed a contract which involved mixing and laying a HBM (Hydraulically Bound Mixtures) road sub-base using the newly launched weighing version of the RMX400C, mobile continuous mixing plant, from Rapid International Ltd.

By using the mobile plant on-site, Bardon (a division of Aggregate Industries) were able to keep mobilisation costs to a minimum during this short duration contract. John Donegan, Technical Director of Bardon Composite Pavements says, "The high outputs, achievable through the mixing plant, enabled the works to be completed in 7 days, which was ahead of the contractor's programme."

This contract on the Longford Bypass in Ireland involved mixing and laying HBM road sub-base which was a CBGM C16/20 with local aggregates. The mobile continuous mixing plant from Rapid International can produce up to 400 tonnes per hour and records the quantities by weight of each material added. The plant's record keeping is automated, precise and detailed and provides Bardon with accurate information.

The new RMC400CW model now incorporates a 1200mm belt conveyor between the aggregate hopper and the continuous mixer. The weighing belt is supported on load cells and this measures the weight allowing the feed rate of the aggregate to be determined. The new plant also incorporates a cement weigh system, using a rotary valve feeding a weighed screw with twin outlets for discharging into the mixer. The water is monitored using a flow meter.

The pugmill mixer, incorporated into the plant is fitted with twin mixing shafts with mixing paddles configured to thoroughly mix the material whilst propelling the mix along the mixing chamber toward the outlet. A layer of base material is allowed to build up on the wall and floor of the chamber, protecting the rubber lined walls and base from wear.

The cleaning system which is unique to the Rapid International continuous mixing plant is one of its key selling points for customers. As well as access lids on top of the mixing chamber, the sides of the mixer are hinged down hydraulically giving complete access to the paddles and interior for maintenance. Also the bottom of the mixer is formed by a conveyor belt, which is operated when clean out takes place, taking the waste material away on the conveyor. This greatly simplifying (and speeds up) the cleaning operation.

The Longford Bypass is approximately 3km in length and is located on the N5 to the north and west of Longford in Ireland. The scheme is being carried out for the Ireland's National Roads Authority by Wills Bros Ltd, Civil Engineering Contractors.

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A90 gets a novel retread from Breedon Aggregates Successful trial of new asphalt modified with rubber from recycled tyres

The first major UK trial of a new asphalt made partly from recycled waste tyres has been successfully completed on behalf of Transport Scotland by Breedon Aggregates.

Late last month a short stretch of the A90 dual carriageway between Perth and Dundee was resurfaced with the revolutionary material and a recently-completed 'grip test' on the new surface has now confirmed its viability. This stretch of road is one of the busiest in Scotland, carrying around 35,000 vehicles a day. Over the next few months the material will be closely monitored against a number of key performance criteria, including skid resistance, and the early indications are very encouraging.

Unlike previous attempts at using rubber in asphalt, which usually involved trying to melt the rubber completely before mixing it with stone and bitumen, Breedon Aggregates has secured access to new technology from Danish company Genan which enables it to incorporate rubber particles directly into the binding agent. This is achieved at lower temperatures, with lower levels of emissions, bringing significant environmental benefits.

"This could transform our approach to road surfacing in the UK," said Alan Mackenzie, chief executive of Breedon Aggregates Scotland. *"Our industry has been trying for years to successfully incorporate recycled rubber into asphalt, without much success. Thanks to this new technology, which we are partnering with Genan to promote in the UK, we can help change that."*

Since 2006, EU rules have banned the disposal of tyres to landfill, leaving large quantities of shredded rubber to find alternative uses in various forms of recycling. According to the European Tyre and Rubber Manufacturers Association, nearly 480,000 tonnes of used tyres arose in the UK in 2009. LCA (Life Cycle Assessment) studies show that for every ton of scrap tyres used for rubber modification of bitumen and asphalt, 1.1 tons of CO_2 emissions are saved compared with incineration of the tyres (for example, in cement kilns).

"We're bringing to the market an asphalt which is more economical and environmentally friendly than any comparable product currently available," added Mr Mackenzie.

"We'll be drawing on a readily-available recycled raw material, reducing the proportion of expensive stone and bitumen in the mix and cutting the amount of gases and fumes produced, so it's an all-round win for us and for our customers."

Transport Scotland (TS) commented: *"We are pleased that industry has identified this opportunity and developed an alternative surfacing material for use on the trunk road network. This adopts a sustainable approach in making the best use of resources available, by re-using an abundant waste material and thereby reducing the use of oil-based bitumen products. TS will continue to work collaboratively with the industry under the auspices of the TS Pavement Forum and we look forward to the continued success of this initial trial."*

Following the success of the trial in Scotland, Breedon Aggregates will now begin to market the new material, to be called Breedon Polymer R+, from its 18 asphalt plants throughout Scotland and England.

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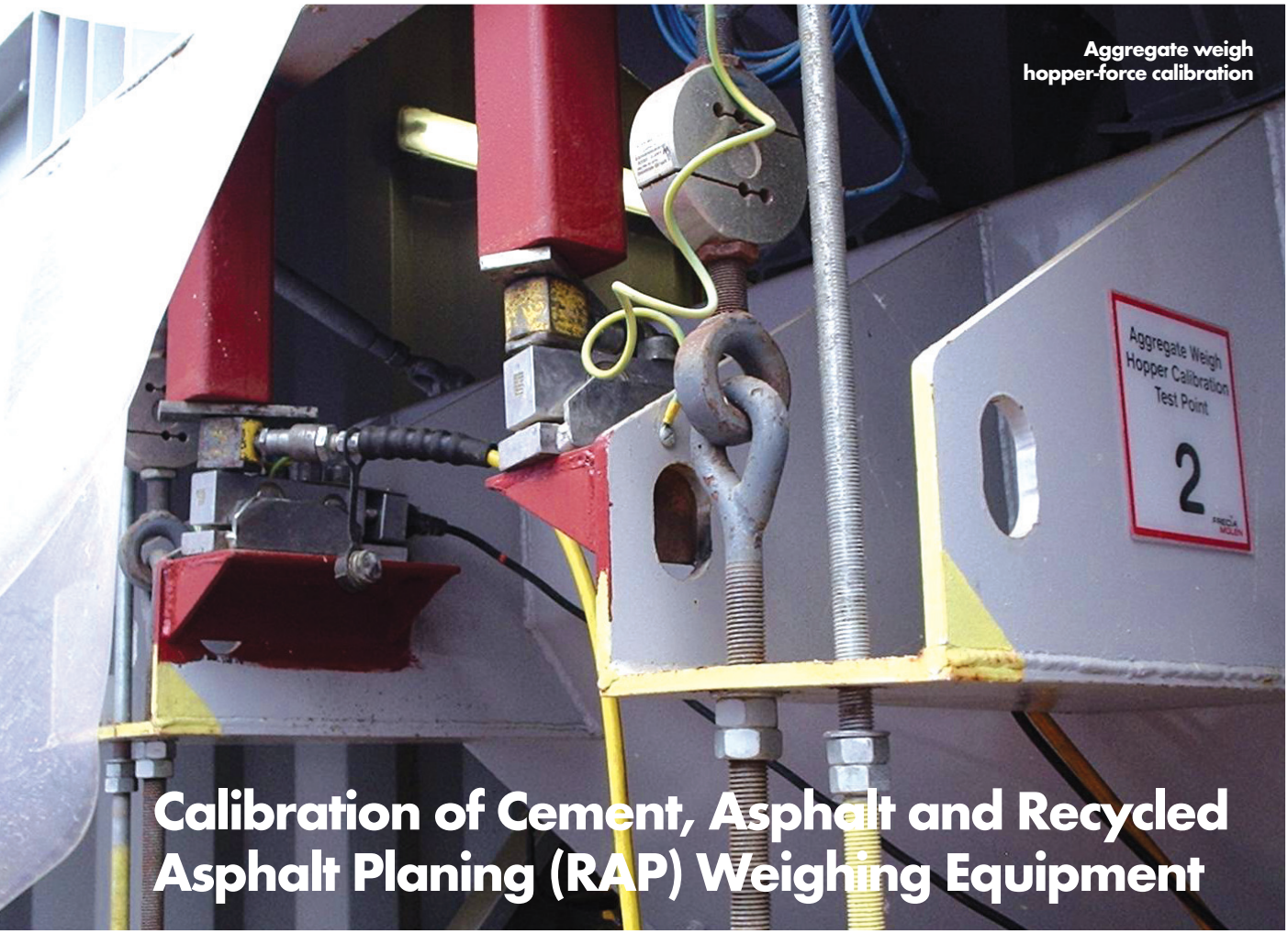

Aggregate weigh hopper-force calibration

Calibration of Cement, Asphalt and Recycled Asphalt Planing (RAP) Weighing Equipment

With many years of experience in the calibration of cement, asphalt and RAP weighing equipment, Precia-Molen offer their customers the widest choice of calibration methods to suit individual site requirements.

Their preferred, well proven method of calibration for these sites is to use Force Calibration. This allows a traceable calibration to be performed quickly, non-invasively, and often can be completed without even taking the hopper or silo out of service, thus reducing disruption and downtime to a minimum.

An approved process:

The process approved by QSRMC and covered by the Precia-Molen ISO9001 quality system is simple. Small hydraulic jacks located onto specially mounted reference load cells are used to apply a load to the hopper or silo. By comparing the weight read-out of the reference load cells with the system being calibrated, any errors can be determined.

Three or four reference load cells (pre-calibrated, certified and traceable to national standards) and their associated hydraulic jacks are positioned between a solid structure and the silo as close to the silos load cells as possible to give the optimum result. The jacks are then operated and the readings given by the reference load cells and the silo load cells are then compared at fixed points throughout the weighing range.

Force Calibration can be adapted to be either 'push up' or 'push down' to suit the silo and the site operations. Often this means that silos do not need to be emptied to carry out the calibration testing which is a major advantage as the product does not have to be stored or the plant stopped.

Using multiple reference load cells positioned as near as possible to the silo's own load cells allows the calibration engineer to check the performance of individual load cells enabling the identification of any potential failure or malfunction. The Force Calibration equipment is both portable and flexible allowing a wide range of silo capacities to be calibrated by carefully selecting the reference load cell capacities. Precia-Molen has test rigs which can be used for silo capacities of 2,000kg, 10,000kg and up to 160,000kg.

Improved accuracy and stock control:

At the site of a major aggregate producer in Derbyshire, Precia-Molen calibrates the cement train loading system using this method. Utilising the Force Calibration system means the silos can be tested to their maximum capacity more accurately and in a fraction of the time taken by any other calibration technique.

The cement train loading system was installed by Precia-Molen some years ago and each silo has a maximum capacity of 80,000kg and a batch size of 60,000kg. Prior to using Force Calibration the silos had to be calibrated using the *"Load Substitution"* method using a combination of Calibrated Test Weights suspended by chains attached to the sides of the silo and material used as "Ballast Weight". This method was both very time consuming and costly.

When asked to undertake a full calibration using Force Calibration Precia-Molen produced a special high capacity system utilising 4 x 40,000kg load cells and 4 x 30 tonne hydraulic jacks linked to an I200 battery powered weight indicator. Calibration tests were successful with repeatable errors of less than 20kg recorded throughout the weighing range.

Clearly the customer was very pleased with the improved speed and accuracy the Force Calibration System enabled them to achieve together with improved stock control, and subsequently entered into a service agreement which includes regular calibrations to ensure that performance is maintained.

Alternative methods and the challenges:

Although perfectly suitable for platform scale calibration, the use of calibrated test weights is often a challenge on cement and asphalt plants. With the silos or hoppers to be calibrated usually located many metres above ground the simple logistics of getting sufficient weights up to the silo can create health and safety issues in addition to the difficulty and time required to physically carry sufficient weights to the hopper location. Even then there is often insufficient space or provision to locate the test weights onto the silo in a safe manner. This method is very labour intensive and consequently time consuming. For larger capacity silos a combination of test weights and product (load substitution) can be used, which obviously extends the time required to complete the testing.

For chemical plants it has long been the practice to calibrate vessels using calibrated flow meters. This involves metering the amount of water which is loaded into a vessel and using a calculation based on specific gravity and water temperature to determine the weight of water loaded into the vessel. However due to its invasive nature this method is less widely used due to the high cost of vessel cleaning and contaminated water disposal. This method is not suitable for cement and asphalt plants.

A further method often employed is calibration by millivolt injection, however this method is applicable mainly where the weighing system is used for inventory control and where the large size of the system makes other techniques impracticable. The shortcoming of this technique is that it does not calibrate the complete measuring chain but only the weight display, resulting in a failed or drifting load cell remaining undetected. A variation of this method utilises small weights to partially calibrate the load cells over a very small part of their weighing range with extrapolation to the full span; but the technique is not likely to be acceptable as a part of an ISO 9000 accredited system.

Regardless of the size of the application Precia-Molen can provide a cost effective solution to all your calibration needs.

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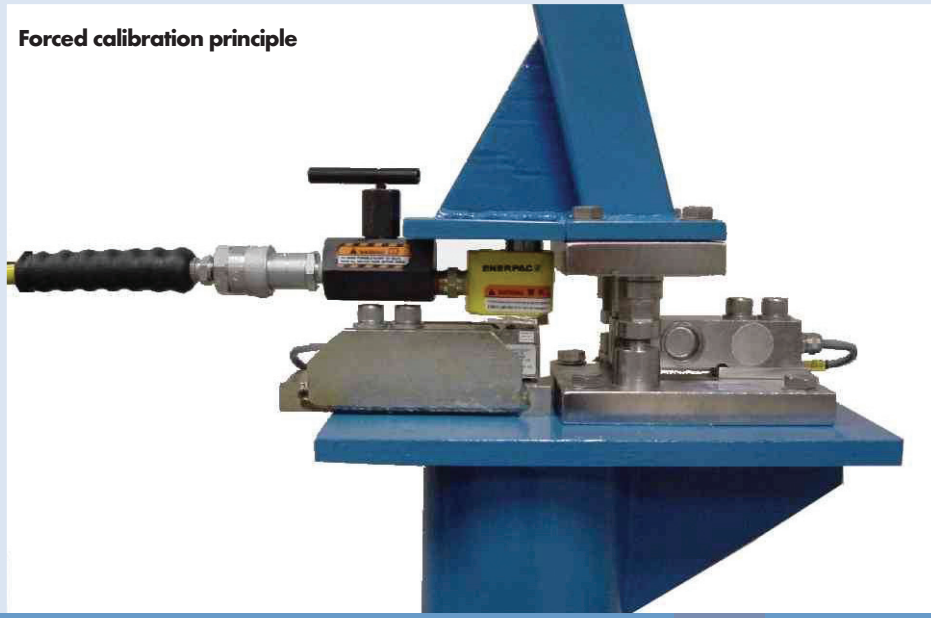
Vessel under test

Forced calibration equipment



Forced calibration principle

Multihog is Four Times more Productive for Glasgow City Council.

Glasgow City Council, Scotland's largest local authority, has quadrupled productivity in its carriageway permanent patching programme since it took delivery of an MH90 Multihog multipurpose implement carrier fitted with a patch planer attachment. It has also improved operational health and safety by reducing the exposure of its workforce to the risks of hand-arm vibration.

A spell of harsh winters and the general wear and tear on road surfaces has made efficient patch planing more of a priority in recent years, and Road Operations Manager David Russell and his team were keen to investigate alternatives to traditional methods as he explains: *"With a road network of 1,750 km to maintain, manual operations with a five man squad using a team of jackhammers were quite slow and laborious. Depending on the size of potholes and their proximity to each other we could expect to cover around 50 to 100 m² a day. We were very impressed when we saw a demo of the Multihog / patch planer combination and realised it could help us to speed up repair work."*

The Multihog AP400 patch planer was developed to offer faster, cleaner and quieter planing compared to other machines on the market. It enables road surfaces to be planed to a width of 400mm and a depth of 125mm and saves on the costs of infill materials by accurately removing only what is necessary. This produces a sound base for reinstatement and helps to reduce transport and recycling costs by creating a re-usable material.

The Multihog has definitely proved its worth at Glasgow as the impressive statistics demonstrate: the five man team can now reinstate between 200 and 400 m² a day, so is at least four times more productive. This enables the workforce to finish repairs in any given area much more quickly, reducing the disruption to traffic flow in the very busy city. David's previous experience with other planers attached to plant equipment was that they were too lightweight to cope with this very heavy duty application, but his verdict is that *"the Multihog's solid construction and powerful hydraulics make it more than up to the job. Its road speed of 40km/h also enables it to travel independently around the city from one job to the next rather than having to be loaded on and off a trailer and this manoeuvrability is much more convenient."*

David is aware of the Multihog's versatility to work with an almost limitless number of attachments, and may look into the winter maintenance kit at some point. But for the moment his focus is on patch planing which is carried out every day across the network. *"Like every other local authority in the UK we had a huge problem with potholes mainly due to the recent extreme winters. Our programme of permanent patching repairs using the Multihog has made a great contribution towards rectifying the situation."*

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Utanazz launches quick-install fully mobile wet concrete plant

Utranazz, the concrete equipment specialist, has launched the TechnoMix mobile concrete batching plant. It is the only mobile wet mix plant on the market fitted with a self-installing mixer that does not require a crane for assembly. The TechnoMix can be up and running within just a few hours of arrival on site and requires only minimal staff for installation. It is capable of producing 50m³ of wet concrete per hour, making it ideal for suppliers of ready-mixed concrete and for large construction sites that require a fully homogenised mix.

The TechnoMix is compact, completely pre-wired and designed to be transported on a standard truck or can fit into a 40' container. During transportation the mixer is an integral part of the plant; upon arrival on-site a specially designed hydraulic lifting system automatically raises the mixer into position. The same system also lifts the support frame and external platforms into place. The aggregate elevator belt is also pre-assembled and simply folds out into place from inside the hopper. The simple automated design of the TechnoMix considerably reduces time spent on installation and dismantling, keeping costs to a minimum.

All components of the TechnoMix plant are managed via a colour touch-screen control panel, which uses a software system developed on a Windows platform. This allows the user to create and store formulas, batching reports and dockets, and download the data so that it can be viewed on any computer. For ready-mixed producers selling concrete to a third party, the entire plant can be operated via notebook, where it is possible to manage and print transport documents and archive customer details, destinations, vehicles and raw materials.

www.hub-4.com/directory/15557

Asphalt Recycling - an economic advantage

Reprocessing reclaimed asphalt is not just economic in a price sensitive market but the process also preserves valuable natural resources.

The Benninghoven granulator is a specialised recycling plant designed to meet the demands of the asphalt industry. It delivers the highest level of production efficiently with minimum fines and dust content.

The use of asphalt recycling is not only subject to economic constraints but also to the statutory provisions for waste management in order to preserve our valuable resources.

The challenge

Impact and jaw crushers were primarily developed for material such as hard rock and concrete demolition, where a high-energy input is required for the crushing process. The use of such machines leads to fragmentation of the aggregates within the reclaimed asphalt and produces a high percentage of fines.

To achieve the end product grading, large quantities of virgin rock must also be added.

Also the fine-grained material in the crushed asphalt absorbs large quantities of water, so adding to increased costs in the asphalt plant drying process.

The solution

In developing an asphalt recycling machine, the main criteria for the Benninghoven R&D team was to design a highly efficient granulator capable of breaking reclaimed asphalt blocks and planings down to a set recyclable size without reducing the original stone content. The Benninghoven Recycling Granulator BRG 2000 is capable of sizing one or two product and can process up to 200 t/h. In its mobile version, this compact unit with its high mobility and quick set up times, is ideal for handling small quantites of material economically.

Principle of operation

The primary crusher of the granulator is fed by wheel loaders. Slabs up to 1,800mm long can be used. Hydraulically powered arms press the material onto the single rotating grinding rotor, where the cutting teeth act against the adjustable crusher camber bar to break down the feed material. If the feed material contains iron components, the spring-mounted breaker bar will allow the material to pass without causing damage.

The speed of the shaft is controlled electronically and ensures a consistent feed regardless of the material type and ensures the system runs at a high production rate. A spring-mounted breaker bar allows the passage of any trapped metal to be removed by a magnetic separator.

The material, pre-crushed to around 0-60 mm, is transferred onto a conveyor belt that feeds a high-capacity two deck vibrating screen which sizes to finished products (0-8 mm and 8-22 mm) for direct stockpiling.

Any oversize material passes to a secondary double shaft granulator beneath the screen for final reduction.

The required final size is obtained by variable adjustment of the gap between the granulator rotors. A space-saving recirculation of the re-crushed material to the high-capacity screen ensures that the finished product only contains the required sizes.

A self regulating, user friendly control system allows automatic processing of the plant. Constant monitoring by the operator is not necessary, so reducing operating costs.

The result

The reducing action of the granulator, which only briefly comes into contact with the feed material, ensures that the entire plant operates with very low wear rates.The material is handled in such a way as to preserve the original grain structure of the aggregates, thereby ensuring a quality product with minimum fines and is ideal for further processing through an asphalt plant.

The machine is offered in various models: fully mobile, skid mounted and stationary.

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Asphalt Recycling ...

Design mix specifications for asphalt mixtures containing reclaimed asphalts are achievable with the RED DRYER.

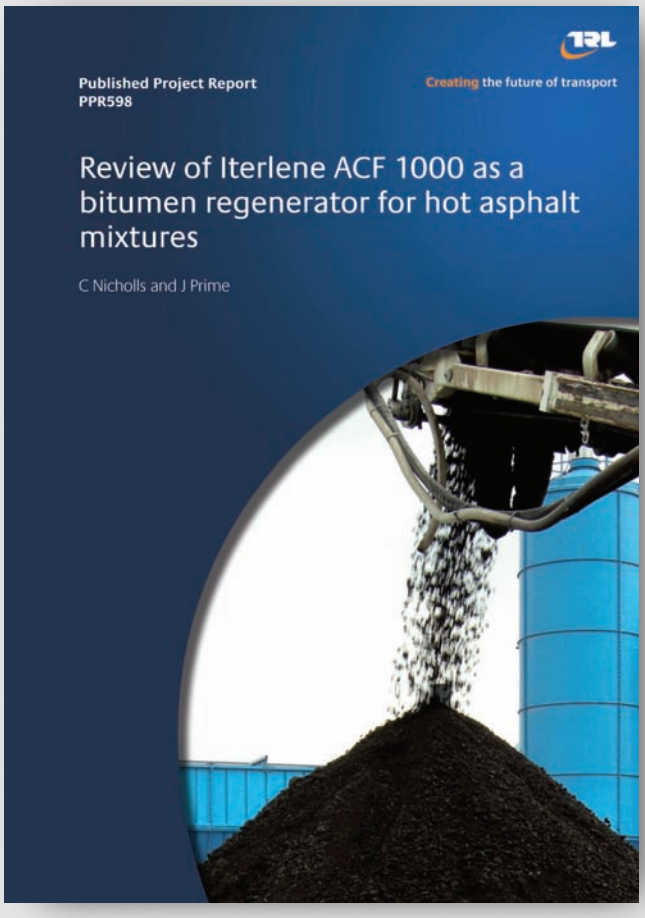
When reclaimed asphalt (RAP) is introduced into the RED DRYER a blend of coated material is discharged, which is suitable for passing across the screens without problematic blinding issues. The ability to screen the materials will ensure that all the fractions of aggregate contained within the RAP are separated into the individual hot storage bins blended with the virgin aggregates, which will ensure the mix specification for the desired recipe, is maintained according to the relative standards The special heating process also ensures the bitumen contained within the RAP is completely recoverable and re-usable allowing for inclusion into a new asphalt mixture.

The RED DRYER's ability to produce asphalts containing RAP in accordance with mix specifications and standards is unrivalled in the market and will help towards improving the re-use of reclaimed asphalts allowed in all types of road pavement materials around the world. www.reddryer.com

Asphalt Recycling ...

ACF1000 Bitumen Regenerator has been proven to restore the degenerated properties of aged binder to allow for the inclusion into new asphalt mixtures.

There is an increased need for, and use of, reclaimed asphalt in the production of fresh asphalt. In order to produce a mixture with the required properties, the grade and quantity of binder added to the mixture has to be adjusted to compensate for the age-hardened binder within the reclaimed asphalt. The adjustments increase as the proportion of reclaimed asphalt is increased. In order to reduce the adjustment needed and in order to increase the consistency of the final product, regenerators can be added to rejuvenate the binder. One such product is Iterlene ACF1000, for which test data is available. The information has been reviewed and further tests have been undertaken to assess the effectiveness of the product. It has been found that the regenerator does recover the properties that have degenerated in aged bitumen for their incorporation into a new asphalt mixture.



(TRL Report PPR598-Absttact)

Asphalt recycling has major advantages.

Ian Griffiths the Managing Director of Berkshire Engineering Supplies Ltd reports that re-using reclaimed asphalt (RAP) makes both environmental and economic sense, as RAP constitutes a "treasure trove" of pre-processed road building materials. The Re-use of RAP will help to reduce the need to excavate and process virgin materials, helping to reduce landfill space. Highways agencies and Tax payers will also benefit, as recycling will reduce costs, allowing for more roads to be kept in better condition. www.berk-eng.com

www.hub-4.com/directory/11637

Concrete Firm on Starting Blocks for Olympic Effort

A precast concrete firm is winning its own race against time to ensure a prestigious Olympic contract is successfully completed well ahead of the upcoming London sporting extravaganza.

Telford-based Elite Precast Concrete is supplying more than 21,000 of its concrete blocks to the official Olympic organisers LOCOG, who are using them as sturdy counterweights to help bolster security and crowd control at venues across the capital during the fortnight of sporting festivities later this summer.

"Wherever there's perimeter fencing or crowd control barriers installed at any of the Olympic facilities, not just the actual Olympic Stadium in Stratford, but all the other venues and fan parks too, it'll be our concrete blocks manufactured right here in Shropshire, that'll be holding them safely in place," Owen Batham, Sales and Marketing Director of Elite Precast Concrete, explained.

The seven-figure contract will see Elite Precast Concrete's interlocking blocks act as kentledge - a reliable form of counterweight - for a total of 30km of perimeter fencing, with concrete chosen because of its extremely robust qualities.

"Traditionally, sand or non-interlocking blocks - similar to breeze blocks - have been used to counterweight perimeter fencing, as well as other outdoor facilities such as marquees and stages. However, interlocking blocks offer a far more durable, reliable, and practical solution.

"Not only are the blocks big and bulky, with each of our Lego and V interlocking blocks weighing between 375kg and 1.6 tonnes, but they can also be stacked on top of each other, and as such, can withstand much greater pressure, which at an event like the Olympics, which will have to cater for millions of spectators, is of paramount importance. And once the Games are over, the blocks can easily be taken down and reused on other projects."

Example of a V interlocking block

Elite Precast Concrete has been working alongside Telford-based hauliers HW Pryce and Son Ltd to ensure the thousands of blocks are transported to London safely on time. Owen Batham commented: *"We're absolutely delighted with the logistic support that Richard Pryce and the team at HW Pryce and Son Ltd have provided us with on this very prestigious contract. They've really gone the extra mile for us, working on weekends and bank holidays amongst others, and we'll be relying on them over the next few weeks to ensure the final few blocks are delivered on time."*

The Olympic contract success comes hot on the heels of the firm almost doubling its storage and production capacity in Telford to more than 50,000 sq ft during the course of this year, a period which has also seen staff numbers increase by almost 30% to a total of 38. Earlier this month, Elite Precast Concrete also won an award for innovation at a major Midlands-wide business competition, with judges praising the company for both its production process - which uses locally-sourced, sustainable secondary aggregate as part of the concrete mix - and the use of sophisticated online sales and marketing campaigns.

"Now we're fast approaching the finishing line on our Olympic project, the next stage of our growth will be to build on our position as the UK market leader in the manufacture and supply of interlocking precast concrete blocks by increasing our exports across Europe, in particular the Benelux and Scandinavian countries, where there is a growing demand for concrete blocks, especially from the waste management and construction sectors," Owen concluded.

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Interlocking concrete 'Lego' blocks being used as Kentledge (ballast weights) for temporary fencing in London

Concrete Batching Systems Ltd. win £500,000 contract in Abu Dhabi, UAE

Concrete Batching Systems Ltd. the Northern Irish specialist in design, manufacture and installation of turnkey concrete batching plants and mixing systems, are supplying two complete and fully automatic batching systems to a major precast concrete product manufacturer in Abu Dhabi in a deal worth around £500,000.

The latest export business deal for static batching plants won by the company, which showcased its machinery in the Northern Ireland Pavilion (E6) at Hillhead, is the direct result of a focus on developing opportunities in the Middle East over the past two years. The new customer in Abu Dhabi has ordered two machines to manufacture concrete products for Saudi Arabia.

The export focus has also resulted in Concrete Batching Systems Ltd., based at Armagh, strengthening business abroad, and it currently sells over 90 per cent of its equipment to customers outside Northern Ireland. Other markets developed by the company now include Libya, Africa, Sudan and Nigeria.

Bryan Irwin, Sales Director of Concrete Batching Systems Ltd. says: *"Our success in the Middle East and other markets is based on our knowledge and expertise in wet and dry concrete production which enables us to develop systems to the specific requirements of our customers."*

"This means that our machinery can be designed and adapted to suit any specific site."

"Concrete Batching Systems Ltd. offers a total turnkey service from specification through manufacturing to installation, commissioning and maintenance with full technical support. Another key feature of our machinery is their modular design, which enables us to expand the systems for customers quickly and easily, thereby minimising any costly downtime."

"We believe that this flexibility and versatility gives us a competitive edge in the international marketplace," he adds. Concrete Batching Systems Ltd. was established in 2009. Managing Director, Kyle Ferris, is a design engineer with extensive experience in the concrete production industry.

Concrete Batching Systems Ltd. will continue to expand its product range and develop new designs and innovations for the concrete industries.

This is a contract that everyone at Concrete Batching Systems Ltd. has strived to achieve and now it has become a firm order and production has commenced.

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