

Belle Group companies, Errut Products and Panther International have developed new machines that sensibly reduce the exposure of their operators to hand-arm vibration. Nick Johnson reports.



The Belle Group styling embraces the new EFS300 floor saw (left) and the low hand-arm vibration PC and LPC plates.

Licking white finger

Vibrating plate compactors by their very nature vibrate. The challenge for their designers is to direct the vibration downwards into the ground to achieve maximum compaction whilst minimising the potentially harmful vibrations transmitted up their handles to the operator. And as the risks of diseases such as ‘vibration white finger’ become more apparent, so some designers have been concentrating on developing plates which dramatically reduce the vibration transmitted to the user.

Recent research from the Health & Safety Executive (HSE) suggests that over one million workers are exposed to potentially harmful levels of hand-arm vibration. And the construction industry was found to have the greatest number of workers (around 460,000) at risk.

Hand-arm vibration syndrome (HAVS) is the name given to a group of diseases, of which the most widely known is ‘vibration white finger’. Workers using hand held tools such as breakers and vibratory equipment like plate compactors are at risk of exposure. With claims for industrial injury increasing and the European Commission proposing a directive that would require employers to take action to reduce exposure, the demand for vibration damped equipment will undoubtedly increase. So the launch this month at Hirex 2000 of new plate compactors from Belle Group company Errut Products appears very timely.

LOWEST LEVELS

Replacing the former EPC models, the new PC range offers an expanded range of sizes with more stylish looks and what Errut’s Engineering Design Manager, Ian Morris, contends as “the lowest operator vibration levels in the industry.” The PC forward travel plate compactors are being produced in seven sizes with plate widths from 300mm to 600mm in 50mm increments and operating weights from 63 to 89kg. With model designations reflecting plate width, the 450mm wide PC450 and the 600mm wide PC600 represent new sizes in the Errut portfolio.

The smallest PC300 is powered by a 1.9kW (2.5hp) Honda G100 petrol engine whilst the PC400 to PC450 can have the 3.0kw (4.0hp) GX120 and the largest PC550 and PC600 can be fitted with the 4.1 (5.5hp) GX160. A diesel option is available for the PC400 to PC600 in the form of the increasingly popular Hatz 1B20.

Hand-arm vibration is measured in metres per sec squared (m/sec^2) and taking the 400mm class plate as the example, Errut has succeeded in reducing the single axis vibration from 64.5 to

3.93 m/sec^2 . This translates to a safe usage time of 243 minutes a day on the new PC400 compared with only 80 minutes on the former EPC400 – thereby allowing over two and a half times safe usage time for operators.

This dramatic reduction in hand-arm vibration has been achieved by hinged ‘comfort’ handle and by flexibly mounting the vibrating base plate to a very rigid engine protection frame. Considerable use has been made of detailed finite element analysis and extensive field testing in order to get the right balance between the requirement to optimise compaction and forward speed and the need to minimise hand-arm vibration levels and operating weights.

Errut claims that, despite achieving lower levels of hand-arm vibration, its integrated anti-vibration technology still provides greater compaction and vaster maximum travel speeds. Again taking the 400mm width PC400 plate as the example – vibrator force is up to 16.5kN (from 12.0kN on the old EPC400) and, likewise, the maximum travel speed rises from 18 to 20m/min.

TIZER TEST

Trying to measure the reduction in hand-arm vibration without all the proper scientific equipment is very subjective. So before visiting Errut to put the old and new machines through their paces, I pondered on how to simply but graphically test the difference. A glass of wine helped the mental process and soon provided the flash of inspiration I needed – and the PHE Tizer Test was born!

Having armed myself with a wine glass, an improvised adjustable bracket and some hose clips with which to secure the bracket to the handle of the old and new compactors I set out to see how much liquid would be shaken out of the glass as each compactor compacted an identical length of gravel. And rather than waste good red wine – I opted for a cheaper but still easily visible measuring medium – Tizer!

All rather Heath Robinson you might think. Well yes but the Tizer Test did prove very visually – if not that scientifically – that much less vibration was reaching my hands as I moved the PC400 over the measured distance. Twice as much liquid was lost with the old style plate than with its successor but the ‘test’ had to be abandoned after only one measured run with each as the vibration from the EPC400 succeeded in getting the better of the Superglue joint between the stem of the wine glass and my makeshift bracket!

Whilst my test apparatus might have appeared somewhat

crude, the same cannot be said of the appearance of the new PC plates. For they feature a purpose made front cover moulded from impact resistant, injected moulded plastic material. This cover can be supplied colour impregnated in Belle orange or in red, yellow, green or blue to suit particular corporate colour schemes. And for the image conscious plant hire company there is plenty of space to stick decals.

Other good features of the PC plates are their integral top mounted lifting point and the hand holds front and rear on the base plate. The padded handle folds neatly over the top of the sturdy engine protection frame to take up less space during storage and transportation.

Optional equipment includes an easily attached pair of rear mounted transporter wheels and a water spray arrangement complete with a moulded 15 litre capacity water tank. This tank fits on top of the frame so that the weight of its contents is evenly spread across the whole of the base plate.

As well as the standard base plate, the new PC compactors can be fitted with Errut's patented Dual Force base plate which features a small raised centre section underneath so that final compaction is carried out on their smaller contact area once the full plate area has achieved primary compaction. Errut states that this arrangement enables it to achieve the over 1400kg/m² HAUC compaction category with a much lighter weight plate. There is also a special pad for block paving work.

LIGHTWEIGHT PLATES

In addition to the professional range of PC plate compactors, a light LPC range has also been developed by Errut for those users who require an easy-to-handle unit for general compaction applications and when manual handling on site is a major factor. These lightweight, compact LPC plate compactors have widths of either 300mm or 350mm and respective operating weights of only 43 kg and 45 kg – to make them easy to get on and off the back of a wagon.

Both powered by the 1.6kW (2.5hp) Honda G100 petrol engine, the LPC300 and LPC350 have respective single axis vibration levels of 4.1 and 3.8m/sec² which enable them to be safely used by an operator for 224 and 261 minutes a day. The comfort handles on these LPC plates can be unpinned for easier transport and storage and the machines are only produced with standard plate configurations.

As well as these new PC and LPC plates, Errut is using Hirex to introduce a new compact floor saw suitable for the safe and efficient cutting for small areas of concrete and asphalt. Designated the EFS300, Errut contends that this pedestrian controlled unit with its 300mm diameter diamond blade is an ideal replacement for hand held saws which are often used for floor sawing applications.

The family likeness to the PC plates is evident as the EFS300 floor saw features a similar main frame with moulded front cover and top mounted 15 litre capacity water tank. The unit has a long



These new 'low vibration' hand held hydraulic breakers will complement Panther's existing 'semi-vibration' range.

wheelbase and a fixed mainframe to provide increased stability and the water supply is fed to the back of the blade to improve dust suppression.

Powered by a 4.0kW (5.5hp) Honda GX160, the EFS300 has a dry weight of 60kg. Particular features of this new unit are its fully enclosed blade and the dampened blade lowering. The use of a blade guard should stop flying debris during operation and it allows the saw to be transported complete with its blade.

The dampened blade lowering system utilises a gas strut to allow infinite depth of cut control. The damping is said to help avoid the shock loading a subsequent blade damage which can be associated with lowering the blade of conventional floor saws into the cut. And another safety feature is the fitment of an emergency stop switch as standard.

Another significant introduction from the Belle Group is what is claimed to be the first block splitter designed specifically for the quick and accurate cutting of concrete and clay paving blocks. Sold under the Belle name as the Minipave, this lightweight (16kg) unit has a clever cutting action which combines the power of a lever and the slicing action of a cam to provide accurate and smooth cuts using 6mm square, four edge blades.

HARD LANDSCAPING

Belle states that "unlike cumbersome conventional splitters, the new Minipave can not only be carried in one hand but also be operated comfortably at ground level." The unit is therefore said to be particularly suitable for path and driveway work as it is easy to operate and move along as laying work proceeds. With 20 million m² of block paving laid in the UK last year and the current growth in the domestic 'hard landscaping' sector (fuelled by TV programmes like Ground Force) Belle is clearly hoping the its Minipave will prove to be a big seller.

Also to be seen on the Belle Group stand at Hirex will be a preview of the latest development in 'low vibration' hand held hydraulic breakers from Group company, Panther International. Expected to be available for sale from April this year, the new 'low vibration' 2021V/D and 2026V/D will complement rather than replace the company's existing 'semi-vibration' range.

The 2021V/D is a 21kg medium weight breaker whilst the 2026V/D weighs in at 26kg to compete in the medium/heavy weight breaker class. Both are claimed to offer the lowest hand-arm vibration levels in their respective classes for this type of equipment, without compromising breaker performance, to enable greater continuous safe usage times for the operator. A feature of both breakers is the Panther fail-safe Trigger Lock which was launched at Hirex last year. Once again it seems that the Belle stand will be one stand at the NEC stand that ought not to be missed. ■

NEW ERRUT FORWARD DIRECTION PLATE COMPACTORS

Model	Plate Width (mm)	Operating Weight (kg)	Vibrator Force (kN)	Single Axis Vibration (m/sec ²)	Usage Time (mins)
LPC300	300	43	11.0	4.10	224
LPC350	350	45	11.0	3.80	261
PC300	300	63	16.3	5.50	1235
PC350	350	79	16.5	4.10	224
PC400	400	81	16.5	3.93	243
PC450	450	83	16.5	3.70	256
PC500	500	85	16.5	3.65	282
PC550	550	87	16.5	3.58	294
PC600	600	89	16.5	3.02	412

Instant Info: 01298 84606
Belle Engineering (Sheen) Ltd