Equipment and Technology Review

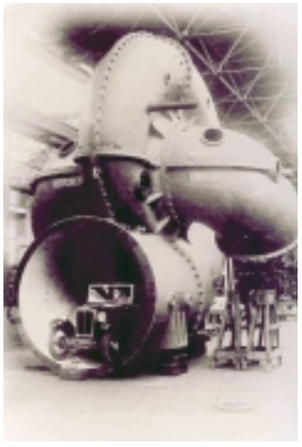
Allen Gwynnes Pumps – name resurrected

With a design and manufacturing history stretching back 150 years, Allen Gwynnes Pumps, a name long associated with the manufacture of large, performance critical pumps, is once again an active force in the market place, operating from its new head office location in Middlesbrough, UK. The company was acquired by NEI during the 1970's, and then became part of Rolls Royce in the early 1980's. During this time the name Allen Gwynnes Pumps was no longer in use in the market place.

Due to a reputation of 'fit and forget' reliability, it is believed that customers lost contact with the company during this quarter century lapse. However, Allen Gwynnes Pumps has since become part of the MMC group of companies, and is once again trading under its original name.

Allen Gwynnes Pumps supplies high performance pumps for use in power generation, tunnelling, land drainage and irrigation, quarrying, water and sewage treatment and chemical engineering, together with a wide range of general processing and industrial applications.

For further information contact: Allen Gwynnes Pumps Ltd, Fortyfoot Road, Middlesbrough, TS2 1HG, Tel: +44 (0) 1642 888900, Fax: +44 (0) 1642 888811, Email: info@allengwynnes.co.uk, Web: www.allengwynnes.co.uk



Fascinating archive photograph showing a mammoth Allen Gwynne pump

RES No. 201

Eickhoff success with Milling Cutters

Founded in Bochum in 1864 Eickhoff Bergbautechnik is nowadays operating worldwide as a manufacturer of heavy-duty roadheaders of up to 120t for tunnelling and mining. Backed by decades of in-depth practical experience in cutting techniques, Eickhoff started to launch excavator-mounted, hydraulically driven milling cutters in the early 90s.

Since 1994 Eickhoff hydraulic milling cutters of the ETH series have been used for a wide variety of applications and achieved widely recognized successes around the globe. The ETH series consists of three different types: ETH 30, ETH 50 and ETH 200; power: 100/150/270kW; weight: 1730/2780/7650kg. Possible fields of application include among others profiling and excavating work in tunnelling, milling of trenches down to a width of 70cm (true to profile and without unnecessary overbreak), demolition, asphalt cutting and underwater construction down to an underwater depth of 10m.

Combinations of the Eickhoff milling cutter type ETH 30 and of the Liebherr tunnel excavator R 932 Litronic have proved to be extraordinarily successful for tunnel excavation and, more specifically, for cutting the precise tunnel profile after shotcreting. The ETH 50 is mounted on even heavier excavators. To date, the high performance potential of Eickhoff milling cutters has been proven in more than 50 tunnel projects worldwide.

In Switzerland where the ETH milling cutter series is already well-known for its high efficiency in tunnelling, projects such Cern, Tunnel Ferden, Tunnel Gorgier, Tunnel Sévaz, Tunnel Porrentruy, Tunnel Concise, Äscher Tunnel, Lötschberg Basis Tunnel North are all applications which testify to its unique features.

Excavator mounted ETH 30 milling cutter from Eickhoff

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RES No. 202

Derrick DE-1000™ VFDTM Smart Centrifuge

The Derrick DE-1000™ VFD™ (Variable Frequency Drive) is a new concept in centrifuge operation and control. The centrifuge offers flexibility in system control enabling it to handle a wide range of feed slurries. Automatic load sensing and feed pump control enable automated performance optimisation. The bowl assembly can be operated between 0 and 4000RPM, which can result in an internal centrifugal acceleration of more than 3000 G's. To accommodate low levels of agitation and rapid solids removal, the conveyer is capable of differential speeds from 1 to 100RPM.

Derrick DE 1000 Centrifuge

The DE-1000™ VFD™ is mounted on a portable skid that includes a two point effluent discharge for easy setup. All rotating assembly components are manufactured from corrosion resistant 316 grade and high strength stainless steel alloy materials.

Liquid and solid bowl heads are machined from forgings while the bowl and conveyer hubs are constructed from centrifugally cast stock. The drive system consists of two explosion-proof inverter duty motors. The first is a 37.3kW motor which is directly connected to the bowl through a 1.4:1 pulley ratio. The second consists of a 7.46kW HP motor which is connected to the conveyer gear-box input pinion shaft.

Each motor is powered by a high performance pulse width modulator (PWM) AC drive with insulted gate bipolar transistor (IGBT). Each of the motor drives and other peripheral devices are controlled by an environmentally robust IBM compatible Pentium PC. The PC and all other devices communicate through a high-speed, machine level control network.

PC control offers unlimited operating flexibility while allowing long term data storage so that critical parameters can be logged into historical trends. In addition, remote monitoring and control of the centrifuge can be accomplished from an adjacent control room or from thousands of miles away. Various configurations are possible and multiple user access over simple telephone lines/LAN enables easy troubleshooting.

For information contact: Derrick Equipment Company, 15630 Export Plaza drive, Houston, Texas 77032. Tel: +1 (0) 281 590-3003, Fax: +1 (0) 442 6948, Email: derrick@derrickequipment.com Web: www.derrickequipment.com

RES No. 203

Taisei – Spherical shield TBM technology

Spherical shield TBM technology is capable of continuously boring vertical and horizontal tunnels using a single machine. The spherical shield TBM can be rotated in any direction at any time during the tunnelling process, making possible a number of tunnel configurations.

Spherical shield TBM's are claimed to offer numerous advantages over conventional TBM's. Since the vertical tunnel (access shaft) constructed by the machine can be smaller than the size of shafts with conventional retaining walls, the method enables boring down from confined sites in crowded residential or commercial areas. Access shafts at turning points can be eliminated, construction periods are reduced and environmental impact is greatly diminished.

The boring machine has a spherical unit that contains a smaller cutter-head. The larger shield machine tunnels either horizontally or vertically to the planned corner and the spherical unit rotates allowing the smaller machine to bore in the new direction.

The machine is sealed mechanically against water; it can bore a tunnel under the water table without affecting the groundwater scheme and without causing ground subsidence.

Spherical shield TBM technology received the Japan Society of Civil Engineering Award for 1994 and the Imperial Invention Award in 1997 in Japan and has been patented in the US and EU countries (US Patent No. 5,634,692)

Further information contact: Taisei Construction Corporation, 6161 Katella Avenue, Suite 200, Cypress, CA 90630, USA, Tel: +1 (0) 714 886 1530, Fax: +1 (0) 714 886 1546.

RES No. 204

Volvo Construction equipment launches new compact excavators

The new 1.5 to 2 tonne Volvo B-series compact excavators combine a new state-of-the-art load sensing hydraulic system, reduced sound levels and enhanced security. The EC15B and EC20B compact excavators are fitted with a load sensing hydraulic system. This system provides power, smoothness, controllability and independence of all movements for improved efficiency, precision and comfort, and therefore increased productivity. The new excavators also have dramatically improved soundproofing. The result is a considerable reduction of the internal as well as the external sound levels, leading to less operator fatigue and more comfort while making the machine better suited for use in urban areas.

One of Volvo's new small excavators

Attention has also been paid to safety. When lifting the console of an EC15B or EC20B, it locks all the machine controls, including the equipment, the blade, the translation and the rotation of the turret. This prevents risks of accidents when climbing in or out of the cab. A new set of powerful halogen working lights gives perfect visibility when operating in the dark.

In order to maintain a high resale value, all equipment connectors are protected under thick plates and the newly designed wrap-around counterweight is protection for the rear. All hydraulic tubes are zinc-coated to prevent them from rusting.

. . . and appoints 9 dealers in China

Volvo Construction Equipment (CE) announces the appointment of 9 authorised dealers in China. Keith Ellis, President of Volvo CE Asia Markets, comments, "We are delighted to be associated with our new dealers in China. These companies are experienced in the sales and marketing of construction equipment in their respective territories and their level of service reflects Volvo's standard for customer care. This is a vital step in the development of our presence in this important market".

The 9 dealers are: Beijing Harmony Resource Technology Co., Ltd, Qinghai Century Development Technology Co., Ltd, Beijing New Construction Machinery Equipment Co., Ltd, Liaoning Liao An Construction Machinery Co., Xi'an Wonder Technology Co., Ltd, Wuhan Zhongnan Construction Machinery and Equipment Co., Ltd, Hangzhou Liyang Construction Machinery Co., Ltd, Asia Sky Holding Ltd and Guangzhou Zhongnan Machinery & Equipment Co., Ltd.

Each of the dealers will sell and service Volvo's complete range of construction equipment – wheel loaders, articulated haulers, excavators, motor graders and compact equipment – in their territory.

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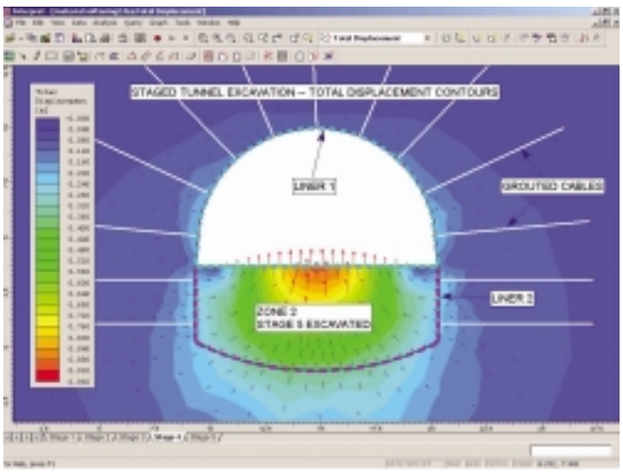
RES No. 205

Rocscience geomechanics software

Rocscience Inc. is a geomechanics software development company that was successfully spun-off from the University of Toronto. Specialist fields include slope stability, tunnel support design, 3-dimensional stress analysis and data visualisation. Projects where Rocscience technology has been used include mines, underground power caverns, highway and subway tunnels,



Computer screen shot from Rocscience Phase 2 software

rockfall barrier systems, and rock and soil slopes, to name but a few.

Rocscience Inc. has several software programs, which can be used for tunnelling applications. Phase 2, a 2-dimensional, elasto-plastic finite element program for stress and deformation analysis. The latest version of Phase 2 has many advanced features, which benefit tunnel design, including powerful support modelling features, such as for various types of bolts, or tunnel linings (e.g. shotcrete or concrete). Composite lining systems can be modelled, with staged application of up to four layers of support, with an optional joint between the rock mass and the first layer. Material properties can be staged, for example, to model the softening of a rock mass, or the strength increase of a shotcrete liner, with time. Axisymmetric modelling allows for pseudo-3D modelling of an advancing tunnel face.

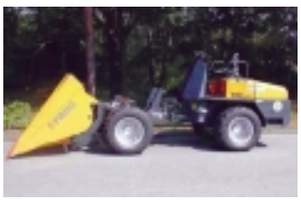
Other Rocscience software programs with tunnelling applications are: RocSupport (support estimation for tunnels in weak rock, using ground reaction curves), RocLab (a rock mass strength analysis using the generalised Hoek-Brown failure criterion), and Unwedge (limit equilibrium analysis of 3-D wedge stability in underground excavations).

For further information contact: Rocscience Inc., 31 Balsam Ave., Toronto, Ontario, Canada M4E 3B5, Tel: +1 (0) 416-698-8217, Fax: +1 (0) 416-698-0908, Email: software@rocscience.com

RES No. 206

Paus launches new small loader

Paus has now launched the PFL 8, claimed to be the world's smallest underground loader at only 1.15m wide and 1.65m high. The PFL 8 is powered by the new Deutz BF3L 2011 engine (40kW/2500 min-1) and can be equipped with a common exhaust gas filter system.



The new PFL 8 loader from Paus

The San Bernardino Tunnel revision project will be one of the first sites where the new PFL 8 will be in operation. Small cross section evacuation tunnels will be built off the main tunnel and the PFL 8 was the ideal loader for these limited dimensions.

The Paus loader range now consists of 4 machines with capacities of 0.8, 1.2, 1.8 and 3m^3.

For further information contact: Hermann Paus Maschinenfabrik GmbH, Siemensstrasse 1-9, D-48488 Emsbüren, Tel: +49 (5903) 707-0, Fax: +49 (5903) 707-33, Email: glpaus@paus.de Web: www.paus.de

RES No. 207

RES No. 141

RES No. 143