

Une histoire de famille...



Le Groupe Melkonian est spécialisé dans la fabrication, 100% française, de matériel pour l'exploitation minière souterraine. L'entreprise, fondée dans les années 60 par nos parents Jacques et Angèle Melkonian, s'est volontairement spécialisée dans la roche dure et l'extraction souterraine (mines d'or, de diamants, d'uranium, de nickel, de cuivre...).

Nous avons rejoint l'entreprise en 1987 comme une évidence : nos parents nous avaient éduqués avec le projet de développer cette entreprise familiale et nous n'envisagions aucune autre alternative, ayant volontairement choisi des études complémentaires. Nos parents ambitionnaient de nous voir reprendre l'entreprise, pour autant ils ne nous ont pas facilité la tâche, convaincus que nous devions faire nos preuves.

Nous nous sommes vite retrouvés à cinq dans une petite entreprise familiale, avec des tempéraments aussi forts les uns que les autres, et tous autant animés par des projets de croissance, de diversification. Avec du recul, nos parents ont été très généreux car ils ont accepté de se retirer dès qu'ils ont senti que nous

« Pour cela, nous devons leur rendre hommage car combien de fondateurs font de la résistance trop longtemps et empêchent la génération suivante d'apporter sa contribution ou ses compétences au meilleur moment : et pour l'entreprise, et pour eux-mêmes ? »

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Car il y a une période dans la vie où on a la force, l'ambition et le courage ; cette période doit être optimisée avec toutes les chances possibles.

Nos parents nous ont offert cette chance de se retirer au moment où nous étions prêts à prendre les commandes et cela a été un immense cadeau.

Notre premier défi : la reconversion de l'entreprise dans le contexte de crise du bassin minier français qui, à cette époque, voyait ses sites fermer les uns après les autres.

L'ensemble du business modèle est donc revu et c'est un succès permettant de consolider l'héritage familial. A travers sa filiale Aramine, le Groupe Melkonian est aujourd'hui présent dans 70 pays aux côtés des plus grands constructeurs (Atlas Copco, Sandvik ou Caterpillar), là où des exploitations de minerais souterrains sont en activité. L'entreprise offre une gamme complète de produits répondant aux exigences des exploitations de roches dures : or,

uranium, diamant, cuivre, nickel, fer, polymétal...

Acteur de taille moyenne, la croissance, continue et régulière, ainsi que la bonne santé financière du Groupe résultent d'une très bonne maîtrise de notre marché. Nous sommes aussi très

complémentaires avec chacun nos domaines de compétences et des décisions stratégiques toujours collégiales.

Aujourd'hui, nous sommes tous trois co-présidents du Groupe Melkonian qui compte 53 salariés. En 2008, nous avons atteint une taille critique et avons ouvert le capital à la société de Private Equity du Groupe Crédit Agricole, avec le double objectif de pérenniser notre cohésion familiale et le management de notre société.

Une prochaine étape pourra consister à intéresser au capital nos collaborateurs les plus méritants afin de les associer au devenir de l'entreprise.

Geneviève RAMBAUD, Marc et Christophe MELKONIAN



Capital

3,50 €

N° 259 AVRIL 2013

Rigueur :
que sacrifier
dans notre
modèle
social ?

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Aix-en-Provence

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- Les bonnes affaires de l'immobilier
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Stéphane Bern
PAS CHER



Arthur
TROP CHER

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Trop d'IMPÔTS !

La grande tentation de la fraude



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Les 30 qui secouent le business local (suite)

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emblématiques, le Musée des civilisations de l'Europe et de la Méditerranée (Mucem), après quatre ans de travaux et 200 millions d'euros d'investissement. A l'entrée du Vieux-Port, cette «casbah verticale» est construite dans le béton caractéristique de l'œuvre de Ricciotti et jongle avec les influences multiculturelles du bassin méditerranéen. Parrain du programme «off» de Marseille-Provence 2013, cet «esprit libre» sera également le concepteur de l'îlot Fauchier, le projet de rénovation urbaine de la ZAC Saint-Charles, autour de la gare.

PASCAL RODON, 41 ans, DG d'Action Synthèse

Marseille, capitale française du film d'animation ? Pour Pascal Rodon, pas de doute, la ville et sa région bouillonnent de talents. «Après avoir lancé une revue de cinéma "CineLibre", en 1996, j'ai créé un concours de graphisme et remarqué que beaucoup de dessinateurs

venaient de Provence.» Du coup, en 1998, il crée son studio au cœur de la cité phocéenne. Bien vu : en 2005, son dessin animé «Pollux» attire 1 million de spectateurs et génère 26 millions de dollars de recettes. Un deuxième volet est en préparation, ainsi qu'une adaptation du «Magicien d'Oz». Son rêve ? «Être repéré par une major américaine, car ce sont les seules à pouvoir appuyer nos projets, l'Europe est trop frileuse», regrette Pascal Rodon, décidé à faire décoller ses ventes (2 millions d'euros en 2012).

HERVÉ ROFRITSCH, 47 ans, P-DG de la Boule bleue

Le dernier fabricant de boules de pétanque en Provence est un nain à côté du géant Obut, installé dans la Loire et archi-leader en France (80%). Mais, grâce à son marché de niche, il tient le choc : «Nous faisons des produits haut de gamme et de compétition avec, notamment, des boules personnalisées», explique le représentant de la

quatrième génération à la tête de cette entreprise familiale fondée en 1904, rejointe après ses études à l'ESCE. Sa production de 45 000 boules par an génère un chiffre d'affaires stable de 780 000 euros. Des ventes qu'Hervé Rofritsch entend doper par la vente en ligne et les exportations vers l'Europe.

RODOLPHE SAADÉ, 42 ans, DG délégué de CMA CGM

Appelé à succéder à son père, Jacques (76 ans), encore à la barre, cet héritier entré dans l'entreprise en 1994 a déjà fait ses preuves. Parmi ses faits d'armes, en 2008, il a géré, avec une maîtrise unanimement saluée, la prise d'otages en Somalie du voilier de la Compagnie du Ponant, alors propriété de CMA CGM. Puis il a participé activement aux négociations sur la restructuration financière du groupe frappé par la crise (4,6 milliards d'euros de dette). Celles-ci ont d'ailleurs abouti, en février dernier, à l'entrée du Fonds stratégique d'investissement (le FSI, piloté par Bercy) au capital à hauteur de 6%, et à un plan d'économies de 300 millions d'euros, incluant une baisse de la vitesse de croisière des bateaux et la fermeture de lignes non rentables. En parallèle, CMA CGM compte sur de nouvelles destinations, notamment en Chine, et sur son flamant neuf «Marco Polo», plus grand porte-conteneurs au monde (400 mètres de long), pour renouer avec les profits fin 2013 (300 millions d'euros escomptés), avant une possible entrée en Bourse en 2014.

JEAN-FRANÇOIS SALESSY, 43 ans, fondateur de Pimiento

Août 2011 : la natation française cartonne aux Championnats d'Europe. Pour aider les nageurs à faire face à leur succès médiatique soudain, cet ancien directeur du Cercle des nageurs de Marseille lance son agence de gestion d'image. Dans son escarcelle aujourd'hui : les Manaudou sœur et frère et Camille Lacourt, notamment. Son succès (1,3 million de chiffre d'affaires en 2012), Pimiento le doit aussi à un mode de gestion original. «Sur chaque contrat, 25% des commissions sont réinvesties sur le sportif pour l'aider à améliorer son image avec, par exemple, du media-training ou des cours d'anglais», confie Jean-François Salepsy. De quoi séduire des acteurs et d'autres sportifs, alors que Pimiento



RENÉE MAUCORT, 60 ans, P-DG de Léonard Parli

Je peux prouver mathématiquement que mes calissons sont les meilleurs du monde : ils contiennent 42% d'amandes quand tous les autres se contentent de 30% !», clame l'héritière, depuis le décès de son mari en 2000, de la vénérable confiserie aixoise qui, avec 440 000 calissons vendus par an, réalise 1,5 million d'euros de chiffre d'affaires. Après avoir démenagé l'entreprise et ses 18 salariés dans la zone industrielle des Milles pour développer sa recherche, Renée Maucort promet l'arrivée d'«un produit très innovant pour l'été 2013».



CHRISTOPHE, GENEVIÈVE ET MARC MELKONIAN, 42, 48 et 47 ans, coprésidents d'Aramine

Quand, en 1994, les deux frères et leur sœur rachètent à leurs parents l'entreprise familiale d'essieux destinés à l'extraction, le secteur minier français agonise. Seule issue : «Devenir un constructeur mondial, en passant d'un monoproduit à une gamme complète, comme l'exigeaient les multinationales du secteur», raconte aujourd'hui Geneviève Melkonian. Bien visé. En multipliant les appareils et les pièces détachées adaptés aux différents types d'exploitation et de pays, le groupe affiche une croissance de ses ventes de 10% par an, dont 97% hors de France. Mais sa production, elle, est entièrement «made in Provence» ! Il n'empêche, «rien de tout ça n'aurait été possible sans la complicité qui nous unit et le management collégial de l'entreprise», se félicite l'aînée de la fratrie Melkonian.

PHOTOS : GETTY - DR

va ouvrir une antenne à Rio, au Brésil, en vue de la Coupe du monde de foot 2014 et des JO en 2016.

ERIC SARRET, 48 ans, P-DG des Biscottes Roger

Des produits innovants, comme la baguette tranchée ou les mini-toasts, la vente en ligne et l'adhésion au groupement d'entreprises Provence Méditerranée Export pour gonfler la part de ses ventes à l'international : la recette concoctée par Eric Sarret a permis d'éponger le million d'euros de passif de l'entreprise créée par son grand-père, qu'il dirige depuis 2008. L'an dernier, le biscottier aixois a d'ailleurs dégagé un chiffre d'affaires en légère progression à 7 millions d'euros. «On vise 3% de croissance cette année», assure Eric Sarret, prudent, qui continue de faire face à une grande fluctuation du prix des matières premières, à commencer par le blé.

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Les nominés

Geneviève, Marc et Christophe Melkonian, Groupe Aramine (Aix-en-Provence – 13)

Classée parmi les entreprises les plus rentables de France après avoir survécu à la disparition de l'industrie minière en France, Aramine affiche une excellente santé et maintient une bonne position dans le secteur hyperconcurrentiel des fabricants d'engins, surtout dominé par de grands groupes internationaux. L'entreprise, qui fabrique et reconditionne des engins et autres matériels pour les exploitations minières, réalise un C.A de 34 M€ en France, avec un effectif de 98 personnes. Au niveau mondial, le groupe totalise plus de 200 salariés dans 70 pays et réalise un C.A de 160 M€. La société maintient sa production en France au sein de sites qu'elle a soit filialisés soit avec lesquelles elle est en sous-traitance exclusive. Sa résilience, elle la doit notamment à son développement international, mais surtout à la vision de la famille dirigeante. L'aventure commence dans les années 1960. Jacques Melkonian tient un garage à Gardanne. À l'occasion d'une réparation sur un essieu d'engin, il invente un concept qui assure la continuité des chantiers 24h/24. Le succès est tel, que trois ans plus tard, il crée Continental Industrie pour fabriquer à la demande des produits entièrement adaptés aux



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conditions spécifiques de chaque chantier. L'entreprise devient très vite une référence pour l'industrie minière. Au moment de la fermeture des mines en France, en 1990, les trois enfants reprennent les rênes de l'entreprise, rebaptisée Aramine. Geneviève, Marc et Christophe Melkonian, qui ont suivi des études de Sup de Co pour l'une et les Mines pour les deux autres, deviennent coassociés et codirecteurs. Ils réinventent le modèle de l'entreprise en misant sur le développement international avec un réseau de 18 filiales

implantées à proximité des grands sites mondiaux d'exploitation. En 2004, Aramine installe son nouveau siège social aux Milles et se lance dans le reconditionnement d'engins usagers. Grâce à leur capacité d'adaptation, de flexibilité et de réactivité face aux contraintes du marché, les Melkonian parviennent à traverser la crise de 2008 en affichant une croissance à 20 %. *« Notre force réside dans l'entente incroyable entre nous et l'esprit d'équipe avec nos collaborateurs »*, assure Geneviève Melkonian. ■ A.T.

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Laurence Cotte-Martinon, Cotte-Martinon (Nice – 06)

prise familiale née en 1904 à Nice après François, Aimé, André, Jean-Claude et Marcel. Au fil du temps, Cotte-Martinon, créée pour fournir des articles pour la carrosserie à cheval, s'est adaptée au monde moderne pour devenir aujourd'hui le fournisseur des professionnels de la sellerie marine et automobile, des tapissiers décorateurs, des storistes et des industriels de l'ameublement. *« Nous avons également prospecté d'autres marchés, notamment celui du contract qui réunit les professionnels chargés de l'équipement des hôtels et des maisons de retraite, deux secteurs actuellement porteurs »*, précise Laurence

Cotte-Martinon qui tient de son cursus comptable et financier le réflexe *« de ne pas me précipiter mais d'observer d'abord »*. Parmi les 6 000 références proposées et répertoriées dans un catalogue édité annuellement, Cotte-Martinon en a désigné quelques-unes. Aujourd'hui, l'entreprise niçoise emploie 38 salariés, affiche un C.A 2012 de 7,5 M€ (contre 7,067 M€ en 2011) qui devrait atteindre les 8 M€ à la fin du présent exercice. Alors que le nautisme et le mobilier de plein air représentent 40 % de l'activité, la décoration et le contract occupent respectivement 30 % de ce segment. ■ L.B.

Elle affiche assez sereinement ses presque 110... Son secret de longévité : s'adapter. Ou comment une entreprise spécialisée dans la fourniture de tissus et textiles pour la décoration, le nautisme et le plein air, a tissé son succès. Laurence Cotte-Martinon préside désormais aux destinées de l'entre-

NARROW VEIN MINING

Aramine Loaders Win Russian Uranium



The L130D is small enough for cage transport.

In 2010, the Russian uranium production company, ARMZ, took delivery of a fleet of 11 L130D miniloaders, supplied by the French company, Aramine. Designed specifically for narrow-vein applications, the machines are just 1,040 mm wide and have a 2,125 mm inside turning radius when equipped with a 0.6-m³ (1.2 mt) rock bucket.

Based on its output in 2012, ARMZ (Rosatom's mining division) is the world's third-largest uranium company,

having produced 7,572 metric tons (mt) that year. It has underground and in-situ leach operations in Russia, as well as international interests through its subsidiary, Canada's Uranium One Inc. Its largest Russian operation, the Priargunsky Industry Mining and Chemical Union, produces uranium from underground mines at Kraznokamensk in the far southeast of the country, working vein-type resources hosted in the Streltsovskoye caldera.

Discovered in 1963, Streltsovskoye is believed to be the world's largest volcanogenic uranium deposit. Recent estimates give a resource of some 280,000 mt of uranium—equivalent to 330,000 mt of U₃O₈, with reserves of 111,100 mt of uranium at the beginning of 2013.

Lying only about 40 km from the Russian-Chinese border, and 110 km from the point where Russia, China and Mongolia meet, the Priargunsky operation began in the late 1960s. Today it encompasses uranium production from four underground mines, with hydrometallurgical and sulphuric acid plants, and other facilities. A fifth mine is now under development. It is also self-sufficient in power supplies, with its own lignite-mining operation. To place the operation in context, its output since 1968 has been more than 130,000 mt of uranium.

No fewer than 19 separate uranium deposits have been identified within the Streltsovskoye caldera structure, with orebodies mainly occurring in steeply dipping fault zones. The ore field was originally explored for its near-

surface fluorite resources, with the uranium mineralization subsequently being discovered below these. The two largest individual deposits are hosted in basement rocks, while the remainder occur in sedimentary and volcanogenic rocks within the caldera; reserves have been estimated only for the five largest, where mining or development is currently under way.

While past production from Priargunsky has been more than 3,500 mt/y, this has fallen back in recent years, with ARMZ now focusing on investments aimed at maintaining output at 2,000 t/y from the mines. Major factors in the downturn have been the exhaustion of the shallower, higher-grade deposits that were mined first, and the retirement of a significant proportion of the mining workforce, leaving the company with a major skills shortage.

The upshot of the crisis-management plan now in operation was that the mine produced 2,120 mt of uranium during 2012 from 1.8 million mt of ore, with some 1,600 new employees and apprentices being hired.

Priargunsky's main mining method is cut-and-fill, with the company currently evaluating the use of block in-situ leaching as well. The veins are typically 1- to 1.5-m wide, carrying ore grading 0.13% uranium, with operations at depths of between 900 m and 1,300 m (2,950 and 4,265 ft). The Aramine mini-loaders are used in Mines Nos. 1 and 2, and in the Glubokiy ("deep") mine, handling production ore. Typical haul distances range from

From Aramine's Perspective:

EMJ asked Aramine's area sales manager for Priargunsky, Kirill Tolmatchev, why he thought that the L130 LHDs had proved to be successful in the difficult conditions underground there. "The loaders have proved to be very reliable," he said. "Indeed, during last year there were only two machine failures, and overall the loaders had three times the availability of competitive machines there."

"The working conditions are very tough," he said. "The machines can be overloaded, and the roadway conditions can be both rough and muddy. It is also very humid underground."

"The L130s are being used for both development and production," Tolmatchev explained. "One of our big selling

points is that they have a 20% bigger bucket than competitive machines, so are much more productive than other units of a similar width. They also have a more powerful engine."

Asked about the challenges of supplying service to machines in such a remote location, Tolmatchev said the mine does its own maintenance with support from Aramine. "We have a dedicated spares stock specially for Priargunsky," he added, "which means that spares are available on site."

With the mine developing new underground operations, Tolmatchev is confident of winning more orders for Aramine's LHDs. "We plan to have a long-term relationship with Priargunsky," he said.

NARROW VEIN MINING

150 m to 300 m, with nine hours of production time each day.

Weighing 4.7 mt unloaded, the L130D loader is designed for use in tunnels measuring a minimum of 1.8-m wide and 2.3-m high. Aramine provides a choice of three diesel engines for these machines; a 43-kW Perkins water-cooled unit, or a 50-kW air-cooled Deutz, with a 40-kW Deutz engine available for high-altitude operations up to 4,000 m. The machine's ventilation requirement is 86 m³/minute.

The operator's position is side-mounted, with a ROPS/FOPS canopy above. Hydrostatic drive provides tramping speeds of up to 8.5 km/h, with the machine offering a production capacity of between 30 mt/h and 40 mt/h over a 100-m haul distance, down to 15 mt/h at 300 m.

As all of the mines at Priargunsky are shaft-accessed, the Aramine loaders had to be disassembled, lowered in pieces then reassembled underground. Today, all of the maintenance is carried out in underground workshops.

According to Alexei Nevskiy, asset management director for ARMZ, the L-130s have shown good reliability since



Aramine claims that its L130D is more powerful and productive than competitive LHDs working at Priargunsk

they were commissioned, not only because of their build quality but also

reflecting the after-sales support provided by Aramine's service engineers.

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Bpifrance entre au capital des engins de mine de Melkonian

PACA

Le fabricant de camions de chargement de minerais change d'actionnaire.

Omnes Capital était entré dans l'entreprise dans le cadre d'un OBO.

Paul Molga
— Correspondant à Marseille

Entré chez Melkonian en 2008 à l'occasion d'une opération d'OBO (« owner buy out »), Omnes Capital a cédé hier sa participation à un nouveau pool constitué de bpifrance, Amundi (Société Générale, Crédit Agricole) et Sofipaca. « L'entreprise est désormais structurée pour imposer sa gamme d'engins sur tous les marchés miniers », estime Benjamin Arm, directeur d'investissement de l'ancienne filiale du Crédit Agricole.

Créée dans les années 1970 par les parents des actuels coprésidents, Geneviève, Marc et Christophe Melkonian, l'entreprise qu'ils



Une quarantaine de ces engins destinés à l'exploitation minière sont fabriqués dans les ateliers Melkonian de Gardanne. Photo DR

ont rachetée depuis s'est spécialisée dans la construction d'engins destinés à l'extraction et au transport de minerais sur le segment de la prospection souterraine de roche dure (diamant, fer, or...). Après s'être fait un nom avec une offre de services faisant de chacune de ses livraisons un prototype, elle s'est distinguée en concevant le « pont Melkonian », un essieu étroit et solide devenu une référence dans le milieu souterrain, et désormais une gamme de

camions adaptés à l'exploitation de gisements filoniens, la tendance du moment. « Nos machines peuvent rouler dans les galeries étroites qui sont directement percées dans les veines et permettent ainsi des économies d'exploitation », expliquent les Melkonian.

Avec une quarantaine d'engins fabriqués chaque année dans ses ateliers historiques à Gardanne, l'entreprise réalise 25 % de son chiffre d'affaires (environ 40 millions

d'euros l'an passé). Un autre quart de son activité vient du reconditionnement à neuf d'engins de mine usagés de toutes les marques qu'elle revend à prix cassé. Le solde provient de la vente de pièces de rechange à partir d'un catalogue de 650.000 références.

Marché ultraconcurrentiel

Melkonian a séduit plus de 350 clients dans 70 pays sur un marché ultraconcurrentiel où opèrent de gros industriels en Suède, en Finlande, aux Etats-Unis et en Chine. Avec l'entrée d'Omnes, l'entreprise s'est structurée en créant un comité de direction. Plusieurs filiales ont également été ouvertes à proximité d'importants gisements au Niger, Mexique et Burkina Faso. L'organisation de la production a enfin été consolidée en incorporant plus efficacement la vingtaine de sous-traitants, filiales ou partenaires, implantés près des mines françaises fermées. Depuis 2008, le chiffre d'affaires, les effectifs et le résultat se sont accrus de 58 %. En 1994, quand les trois enfants avaient repris l'entreprise, elle employait 17 personnes pour un chiffre d'affaires de 4,5 millions d'euros, dont 17 % à l'international. ■

RECONVERSION

ne jouez pas avec les feux!



Atlas Copco
Scooptram ST18

"The Scooptram ST18 is designed to match Atlas Copco's 60t-capacity Minetruck MT6020"

Cat RH1600H
underground
loader

brake test, protection guards, three-point access system, redundant steering system, safety latches, boom lock-up, fire-suppression systems, machine-protection system and capability for semi-autonomous or radio remote control.

The ST18 comes with a number of service products such as RigScan, an advanced audit product that offers a real-time, non-intrusive look at the equipment's running condition and performance. Another example is the Remote Monitoring system, which makes production and maintenance data available through a user-friendly web interface.

Atlas Copco also offers an operator-training programme consisting of classroom, simulator and on-site training for the ST18.

CATERPILLAR

There have been a number of developments recently in the Caterpillar line of hard-rock mining products. In addition to the trial and commercial installation of the Rock Flow system (see box), the RH1600H underground loader has been launched commercially. This replaces the R1600G, Caterpillar's best-selling LHD. Additionally, the R3000H, which is the largest LHD in the Cat line, has just completed field testing. The model was originally announced at MINExpo in 2012 but is now available for purchase.

The Cat R1600H features changes and enhancements to the engine and cooling system, operator station, safety and serviceability, durability and equipment management. There are also several standard features that were options on

the previous model. The 10.2t-capacity model is now available worldwide, shipped from Caterpillar's new manufacturing facility in Rayong, Thailand.

The R1600H has a Cat C11 ACERT engine rated for operation up to 4,500m above sea level without component changes. Two engine options, US EPA Tier 3 and Ventilation Reduction (VR), are available to suit different regional needs. VR engines emit lower amounts of particulate matter (PM), which can reduce mine-ventilation requirements.

The axle-cooling system now uses the engine jacket water to cool the axle oil. Cooling capacity has been increased to meet the requirements of the C11 engine and axle-cooling system.

The R1600H has improved operator



The Cat Rock Flow System

Block-cave mining is a mass-mining technique used in many underground mines. The Cat Rock Flow System (which was unveiled at the MassMin event in Canada in 2012) was jointly developed with the Chilean mining company Codelco to improve productivity through the use of continuous haulage technology rather than the conventional use of LHDs.

The Rock Flow System combines a rock feeder, a rock mover and an automation system to deliver mass-mining production with improved safety.

Each RF300 rock feeder extracts ore from the drawpoint at a rate of 300t/h and feeds the material onto the rock mover (hard-rock chain conveyor) by a hydraulically operated push plate.

The RM900 rock mover is a dedicated hard-rock production conveyor that collects ore from various drawpoints. An automation system featuring remote operation from the surface allows draw and quality control and records operational data.

Jan Rohwer, product-line manager for hard-rock cutting at Caterpillar Global Mining, explains: "The Cat Rock Flow System is an innovative production system for block-caving operations, generating a continuous ore stream from the drawpoint to the crusher."

"Compared with traditional block-caving operations, the Rock Flow System enables multiple extraction rates, making it an extremely productive haulage system."

Continuous haulage for block-caving operations generates a number of advantages, such as high productivity and flexibility combined with a high level of safety.

The high productivity is achieved by making use of several rock feeder units pushing the ore from the drawpoints onto the rock mover, which is an outboard chain conveyor rated to 900t/h.

"The rock feeder can be removed easily for service and maintenance, and its hydraulic operation has no exhaust emissions into the underground climate," says Markus Frenzel, business manager, Rock Flow System at Caterpillar Global Mining.

"The hard-rock chain conveyor has been engineered to meet the difficult mining

conditions. The design facilitates service operations through the use of wrapped and screwed connections to support quick and trouble-free replacement of worn parts."

In a trial at the Codelco El Salvador copper mine, the system used four feeders, all located on the same side of the conveyor. During the trial, more than 122,000t of ore were extracted at an average rate of 260t/h. Maximum extraction rate was 880t/h.

"The advantages of the system are convincing – significant production increases were proven in the first functionality tests. The installation of the first full industrial application is scheduled to be finished by the end of this year so that field data will be available in early 2015," adds Rohwer.



Cat Rock Flow System conveyor with drawpoint on left

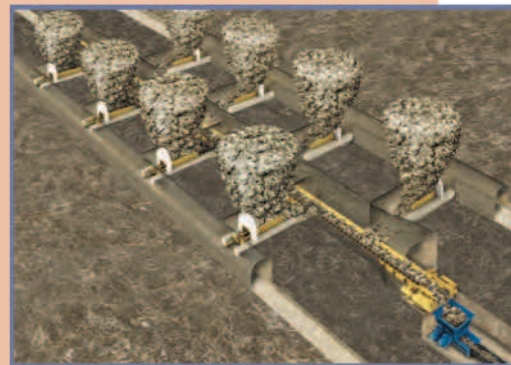


Illustration of system with multiple drawpoints on both sides of conveyor



Atlas Copco
Scooptram ST18

"The Scooptram ST18 is designed to match Atlas Copco's 60t-capacity Minetruck MT6020"

Cat RH1600H
underground
loader

brake test, protection guards, three-point access system, redundant steering system, safety latches, boom lock-up, fire-suppression systems, machine-protection system and capability for semi-autonomous or radio remote control.

The ST18 comes with a number of service products such as RigScan, an advanced audit product that offers a real-time, non-intrusive look at the equipment's running condition and performance. Another example is the Remote Monitoring system, which makes production and maintenance data available through a user-friendly web interface.

Atlas Copco also offers an operator-training programme consisting of classroom, simulator and on-site training for the ST18.

CATERPILLAR

There have been a number of developments recently in the Caterpillar line of hard-rock mining products. In addition to the trial and commercial installation of the Rock Flow system (see box), the RH1600H underground loader has been launched commercially. This replaces the R1600G, Caterpillar's best-selling LHD. Additionally, the R3000H, which is the largest LHD in the Cat line, has just completed field testing. The model was originally announced at MINExpo in 2012 but is now available for purchase.

The Cat R1600H features changes and enhancements to the engine and cooling system, operator station, safety and serviceability, durability and equipment management. There are also several standard features that were options on

the previous model. The 10.2t-capacity model is now available worldwide, shipped from Caterpillar's new manufacturing facility in Rayong, Thailand.

The R1600H has a Cat C11 ACERT engine rated for operation up to 4,500m above sea level without component changes. Two engine options, US EPA Tier 3 and Ventilation Reduction (VR), are available to suit different regional needs. VR engines emit lower amounts of particulate matter (PM), which can reduce mine-ventilation requirements.

The axle-cooling system now uses the engine jacket water to cool the axle oil. Cooling capacity has been increased to meet the requirements of the C11 engine and axle-cooling system.

The R1600H has improved operator



The Cat Rock Flow System

Block-cave mining is a mass-mining technique used in many underground mines. The Cat Rock Flow System (which was unveiled at the MassMin event in Canada in 2012) was jointly developed with the Chilean mining company Codelco to improve productivity through the use of continuous haulage technology rather than the conventional use of LHDs.

The Rock Flow System combines a rock feeder, a rock mover and an automation system to deliver mass-mining production with improved safety.

Each RF300 rock feeder extracts ore from the drawpoint at a rate of 300t/h and feeds the material onto the rock mover (hard-rock chain conveyor) by a hydraulically operated push plate.

The RM900 rock mover is a dedicated hard-rock production conveyor that collects ore from various drawpoints. An automation system featuring remote operation from the surface allows draw and quality control and records operational data.

Jan Rohwer, product-line manager for hard-rock cutting at Caterpillar Global Mining, explains: "The Cat Rock Flow System is an innovative production system for block-caving operations, generating a continuous ore stream from the drawpoint to the crusher."

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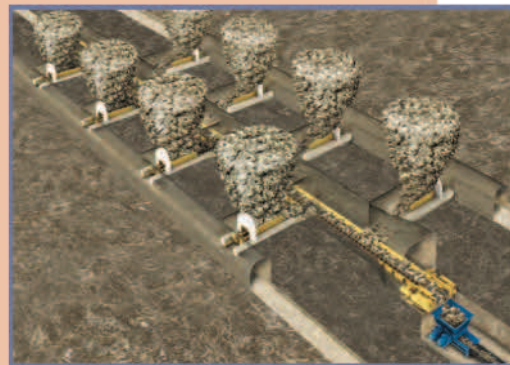


Illustration of system with multiple drawpoints on both sides of conveyor

Cat R3000H
travelling with
load from rear



"The fact that the machine operates underground, in an environment subject to extremely high temperatures and dust levels, puts it to the test every day"

and technician features, with an upgrade to cluster gauges and use of the colour multi-purpose display monitoring system. The Operator Present System is now fitted to the R1600H. This safety feature keeps the parking brake engaged and hydraulic implements disabled until the operator is present and the machine is ready for safe operation. The VIMS Guardian third-generation health-monitoring system is also available as an option for the R1600H.

The new 20t-capacity R3000H loader, which replaces the R2900 XTRA, provides a significant increase in truck-loading capacity, enhanced digging and breakout performance, as well as faster speeds on grade, a strengthened front frame, and the VR engine package to reduce machine and mine operating costs. Despite these enhancements, the R3000H is no larger than the R2900G XTRA and can fit seamlessly into mines using such machines.

Caterpillar says the new LHD has a 16% production advantage over the R2900 XTRA in truck-loading applications. With its added capacity, the loader provides a three-pass match with Caterpillar's 60t AD60 underground articulated truck.

The increased payload capacity results from the larger, repositioned lift

cylinders, which provide greater lifting force, and from a larger tilt cylinder for more aggressive digging and breakout. In addition, a redesigned torque tube (between the solid steel lift arms) and new bucket stops (to reduce stress during bucket rack-back) combine to add strength and durability to the front linkage.

In the drive train, the new lock-up clutch torque converter yields significant tramping speed increases on grade. This speed increase boosts productivity in uphill load-and-carry applications.

The R3000H has a Cat C15 ACERT engine; planetary power-shift transmission with electronic control and manual/automatic shift modes; heavy-duty final drives; four-wheel, oil-immersed, multi-disc brakes; and high-flow hydraulics. The VR engine package provides a 42% reduction in ventilation requirements compared with the R2900G XTRA and a reduction in fuel consumption.

The new Cat diesel particulate filter (DPF) is also now available. Used on Cat LHDs and underground trucks, the system is designed to work with the VR package and uses flow-through filter technology and catalytic conversion to effectively reduce PM to an even lower level than with the VR engine alone. The DPF is installed in place of the existing muffler / Diesel Oxidation Catalyst (DOC) package.

DOOSAN

In late 2013, Doosan delivered a DA30 articulated dump truck (ADT) to KGHM's Polkowice-Sieroszowice mine in western Poland. The DA30 is being used to transport raw materials including salt, and is one of six dump trucks of the same make at the mine.

The DA30 weighs over 23t (over 50t when fully loaded), and like the rest of the mine equipment, was dismantled and taken down the mine via a special shaft, and then reassembled.

The machine was sold by Wigropol, a local company in Polkowice, operating as a Doosan sub-dealer in mining equipment.

When asked to describe some of the most extreme conditions that the Doosan ADT has encountered, Marek Gruchala, mechanical engineering assistant manager at the mine, explains: "Here, every situation is extreme. The fact that the machine operates underground, in an environment subject to extremely high temperatures and dust levels, puts it to the test every day."

A special guard and barrier housing was designed to protect the lights and windscreens when passing through rubber dams, and a special platform for the roadheader operator's assistant was installed to supervise and control salt loading. The machine is also equipped with an ANSUL fire-extinguisher system and DOTRA Communications system. In the case of really steep dips, the inter-axle differential lock can be activated on all the wheels. The machine works 15 hours a day, sometimes travelling three miles each way.

Salt is delivered from the roadheader by the DA30 truck to the dump station, then to the crusher and onto a double-deck vibrating screen. The salt is then conveyed to fine process vibrating screens and, when all the quality requirements have been met, the salt is transported by belt conveyor to a deposit point ready for distribution.

GHH FAHRZEUGE

GHH's current portfolio includes seven dump trucks for mining applications, with payloads ranging from 15t to 55t capacity, and 15 diesel- and electric-driven LHD models. Super low-profile loaders (the SLP product range) with a 1.5m machine height can operate in gallery heights of less than 1.7m. The African market in particular has shown high demand for compact LHDs from the LF and SLP product ranges for application in narrow mining conditions.

Recent developments include a revision of the classic LF-5 LHD (5t payload), which is currently in production. The design now features a water-cooled Deutz TCD 2012 engine that complies with US EPA Tier 3/EU Stage IIIa emission standards. The Deutz TCD 4.1 engine, which complies with US EPA Tier 4 interim and final standards, is an available option, and drastically reduces the required ventilation rates.

Along with the emphasis on robust and easily serviceable technology, the new LF-5 will feature ROPS/FOPS and CE certification, as well as various

The Doosan
DA30 is being
put to the test
at a salt mine
in Poland



► ergonomic improvements to provide maximum performance and flexibility in narrow-vein hard-rock mining or tunnelling conditions.

A recent revision of the LF-10 LHD (10t payload) focused on improvements concerning engine technology (water-cooled Deutz TCD 2013 complying with Tier 3/Stage IIIa standards) as well as optimised ergonomics and controls, with ample leg room in the operator cabin. Furthermore, the visibility from the ROPS/FOPS-certified cabin has been enhanced significantly.

A new version of the 20t payload MK-A20 dump truck with different dump-box options has recently been launched. This features ROPS/FOPS certification and a water-cooled Cummins QSB6.7 engine complying with Tier 3/Stage IIIa emission standards as well as various ergonomic improvements. GHH says its dimensions (length 9.4m, width 2.2m and height 2.5m) and high power-to-weight ratio allow for applications in narrow conditions. The MK-A20 shares the same platform as the MK-A5m³ concrete-mixer truck.

PAUS

In March, Hermann Paus Maschinenfabrik launched the PFL 8 Z, a new generation of its compact loader specifically developed for use at high-altitude hard-rock mines. The company stated that the PFL 8 Z sets new standards in terms of productivity, manoeuvrability and performance.

The PFL 8 Z has a gross weight of 5.3t, a maximum bucket volume of 0.8m³ and a maximum payload of 1.8t. The loader is equipped with a 69kW air-cooled Deutz diesel engine, and features high torque, excellent exhaust emission values and low fuel consumption. ►

"[Paus] stated that the PFL 8 Z sets new standards in terms of productivity, manoeuvrability and performance"

GHH has recently revised its established LF-S LHD with a cleaner engine and ergonomic improvements



Learn more about Redpath!

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**Pitram
will be
integrated
with
Carlson's
machine-
control
solutions**

► The new Paus Power drive unit automatically adjusts traction power and speed to the mine requirements. Tyre and brake wear is minimised thanks to the drive concept, which significantly reduces operating and maintenance costs.

Paus says that the newly developed, high-performance hydraulics guarantee maximum breakout force and driving power with minimal power loss. The new Z-kinematics and the optimised bucket shape allow the driver to fill and empty the bucket faster, making the vehicle more efficient.

The PFL 8 Z also has a lot to offer in terms of driving comfort and ergonomics. All the controls are clearly arranged within the driver's cab and within easy reach of the operator.

Standard safety equipment rounds off the package. The vehicle is fitted with a ROPS/FOPS protective cab roof, Posi-Stop braking system and a dead man's switch integrated in the driver's door. The loader can be equipped with a semi- or fully automatic fire extinguishing system at the customer's request. Side entry also helps to reduce hazards and

improve comfort. The LED lights on the rear and front ends, which act as flashlights in the event of damage to the machine, are an additional safety feature. There is also a beacon light to warn other vehicles.

Simple and fast access to service points is a matter of course. A display with a CANbus connection is integrated in the driver's platform for rapid fault analysis to transmit key vehicle data and fault codes to the driver or service personnel. A further advantage is that the volume of electrical cabling is reduced and thus sources of faults can be eliminated.

Alongside the standard version, the loader is also available with a range of buckets for different uses, and an optional quick-change system allows equipment such as fork arms, crane hooks or even a cage to be accommodated.

MICROMINE advances Pitram

Pitram, MICROMINE's mine-operations system, provides equipment tracking and reporting technologies that help mine operations to optimise and increase control over the load-and-haul cycle.

Mine personnel can know exactly where each truck within the fleet is, and how long they are spending in each cycle status; queuing, loading, hauling, and travelling empty. Bottlenecks at loading units and dump destinations can also be identified and addressed. Through increased control of the cycle, mine operations are better positioned to realise outlined mine plans and schedules, resulting in the achievement of corporate and financial objectives.

Commenting on MICROMINE's commitment to providing accurate equipment-tracking and fleet-management functionality, Michael Layng, MICROMINE operations manager, explains: "MICROMINE has formed a strategic partnership with Carlson Machine Control that will further enhance Pitram's fleet-tracking and management capabilities. As part of this, Pitram will be integrated with Carlson's machine-control solutions."

Introduced to the market in 1997, Carlson's machine-control solutions have a solid history of machine guidance in the construction, mining, landfill, dredging and 3-D drilling markets. Through the provision of hardware and software for high-precision GNSS guidance, Carlson ensures that heavy mobile equipment is operated precisely and according to design, eliminating inefficiencies and unnecessary costs and increasing safety.

The integration between the two systems will increase Pitram's fleet-management capabilities by providing high-precision machine guidance. Equipment operators will be able to perform activities such as drilling, excavation and loading more precisely, ensuring that objectives are achieved more efficiently.

Layng explains: "MICROMINE's partnership with Carlson will provide benefits to both existing and future Pitram customers globally. Through the introduction of machine guidance within Pitram, we are strengthening the solution's fleet-management capabilities".



Mobile Pitram unit

Randy Noland, vice-president of marketing and business development at Carlson, notes: "The alignment of Pitram and Carlson's MineGrade machine-control solutions opens new doors for both companies, particularly within emerging markets that have demonstrated a need for sophisticated mining technologies."

MICROMINE's Pitram development programme is addressing a number of functionalities that will further increase control over the load-and-haul process. Integration with the J1939 standard, developed by the Society of Automotive Engineers (SAE), will allow Pitram to extract engine health and operating statistics such as engine hours, temperatures and key maintenance alerts from the mining fleet.

Layng adds: "J1939 isn't vendor-specific, therefore Pitram will be capable of extracting data from multiple manufacturers. A Pitram mobile unit will plug into a J1939 connector, extract the equipment data and make it available as meaningful information through Pitram reports and displays in the control room."

Pitram aims to alert mine control-room operators and supervisors to potential machine problems and provide key data to maintenance personnel to help make better decisions about maintenance planning. "By making Pitram compatible with the standard, we will be able to provide these operations with real-time information to help maximise equipment utilisation and availability, increase productivity and reduce costs," says Layng.

SANDVIK

Sandvik Mining has upgraded its LH410 underground hard-rock loader to improve operational flexibility and productivity. Topping the list of enhancements is a complete redesign of the front end, improving the LHD's ability to load trucks – including three-pass loading of the Sandvik TH430.

Minna Pirkkanen, product manager for mass-mining underground loaders at Sandvik Mining, explains: "These improvements result from a combination of customer feedback, application of our engineering expertise and product-support experience in supplying more than 1,000 loaders in the 10t class over the past decade."

Improvements to the loader bucket and arm geometry have elevated the bucket pin height by 312mm to 3,863mm. To optimise load distribution and facilitate the dumping process, the 10t-tramming-capacity LH410 also features a redesigned bucket with an improved profile for easier bucket filling and faster dumping.

The bucket system also now features a larger loader boom/bucket pump for better control and faster dump speeds and an improved bucket-shaking system to further increase dump speeds, particularly with muddy or sticky materials.

Improvements to the optional boom-suspension system deliver a smoother ride in bumpy conditions, resulting in better operator comfort, reduced wear and tear and better load retention. Additional enhancements include ergonomic improvements to the accelerator and brake pedals, an ►

The new
Sandvik
LH204

Far right:
Sandvik has
upgraded
its LH410
underground
hard-rock loader



"The LH204 operates productively and profitably in confined applications while handling larger payloads than competitor units"

► upgraded oil cooler and improved transmission and torque-converter cooling to ensure increased reliability, along with a relocated air filter that is easier to access.

"These improvements result in a machine that is more flexible across a wider range of tasks and operations, while also providing increased safety, reliability and productivity," Pirkkanen says. "The LH410 is automation-ready, enabling it to be integrated into a Sandvik AutoMine operation by installing an available upgrade kit."

In March, Sandvik also launched the LH204, a new 4t-capacity LHD designed for narrow-vein underground mining applications. Developed initially for the Chinese market by R&D teams in Finland

and China, Sandvik says the compact, highly manoeuvrable model addresses the challenging loading, hauling and dumping conditions of narrow-vein orebodies.

"The LH204 operates productively and profitably in confined applications while still handling larger payloads than similar-sized competitor units," says Mika Pöyri, Sandvik Mining product manager. "The increased payload capacity results in a productivity increase of at least 13% compared with other LHDs in this size class."

The LH204, which is currently available in China and will be available globally later this year, features an improved powertrain, a higher-horsepower engine and a more powerful transmission, which

translate into higher penetration rates for efficient loading of the 2m³ bucket.

The model features the Sandvik vehicle control and management (VCM) system that monitors all loader parameters, including tramping speeds, operating temperatures and pressures. This expedites troubleshooting and minimises unscheduled downtime. In addition, all daily check and fill points are at ground level, facilitating safe and easy maintenance. ▀



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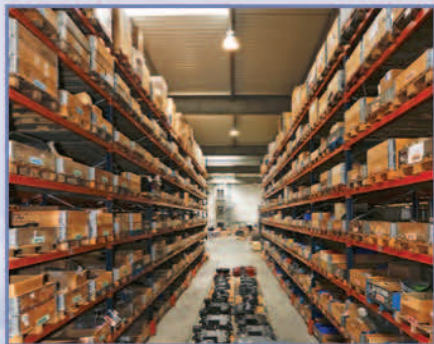
Aramine designs and manufactures a complete range of underground mining equipment dedicated to Narrow Vein application (drill, loader, service, equipment, etc).

DISTRIBUTION

For more than 25 years, Aramine has been the official distributor for Atlas Copco (LHD and mine trucks) and Getman service vehicles in authorised countries only. These two complementary products, associated with the Aramine narrow-vein range, allow the company to promote the widest range of underground solutions.

REMANUFACTURER OF MINING EQUIPMENT

Aramine has an exclusive programme based on



Aramine's stock of more than 1,250,000 OEM references!

strong organisation and long-term experience with the manufacturer's technical support.

Aramine's remanufacturing programme is the only one that offers:

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- exchange components with worldwide warranty.
- remanufacturing process, including a final assembly based on new equipment methods.
- accurate technical documentation and ISO vehicle marking.
- tests and final controls on test tracks.

SERVICE AND MAINTENANCE

Aramine technical and engineering teams provide complete training and services programmes for underground needs (machines, engines, Powertrain, etc).

UNDERGROUND MINING SPARE PARTS: ORIGINAL AND GENUINE

With more than 40 years' experience in the underground mining industry, Aramine has one of the largest ranges of spare parts for underground mining equipment in the world.

The company stocks and supplies spare parts and components suitable for various types of drill rigs, loaders and utility equipment for underground mining. More than 650,000 manufacturers' part numbers are available in Aramine's facilities.

Mining accessories

Aramine provides a wide range of mining accessories:

- cap lamps
- aluminium scaling bars
- fire systems
- hydraulic hose and protection
- exhaust accessories (purifier, silencer)
- crimping machine
- bucket blades
- mining belts and bags, etc.

FULL COMPONENT SERVICES

- **Aramine offers a full range of component services:** new, standard exchange & remanufacture, expertise and repair.
- **For any kind of components:** engines, converters, transmissions, differentials, brakes, rig drill.
- **Brands serviced include:** Dana, Hurth, Axletech Rockwell, CHN Ford, Funk Deere, Deutz, etc.

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www.aramine.com



Les Melkonian

en version internationale

... et familiale !

Le petit garage dirigé par Jacques et Angèle dans les années 1970 à Gardanne a bien grandi : désormais, leurs enfants Geneviève, Marc et Christophe développent à l'international Aramine, une société qui fabrique des engins pour les mines. Une success-story pour cette famille aux racines vivaces.

Par Thibaud TEILLARD



Jacques et Angèle Melkonian, les fondateurs du groupe.

a mine, un secteur du passé ? Ne dites pas cela à la famille Melkonian qui surfe avec succès sur l'appétit des pays émergents en ressources minières. Leur société, Aramine, fabrique à Gardanne des engins très compacts précieux pour exploiter les filons de roche dure. Leurs chargeurs viennent parcourir directement la veine, surfant sur le succès des gisements dits filoniens. Aramine en fabrique une quarantaine par an à Gardanne, expédiés à 100 % à l'export. Les concurrents ? Des mastodontes scandinaves, américains ou chinois. Mais la PME provençale leur tient tête. Mieux, elle croît très vite. Aramine a une longue histoire, qui remonte aux années 1960. Elle a d'abord eu le visage de Jacques et Angèle Melkonian. Mariés en 1963, ils développent tout d'abord un garage qui connaît le succès : « Peu après son retour d'Algérie, mon mari a mis en place une formule qui lui a permis de fidéliser la clientèle locale, raconte Angèle. Comme cela marchait bien, nous avons pris des locaux plus grands et créé une deuxième société, Continental Industries ». Voisins des Houillères de Provence, les Melkonian ont eu l'idée de se lancer dans le matériel minier. En 1972, Jacques met au point le « pont Melkonian », un essieu adapté au travail dans les galeries : « Avec cette avancée technologique, nous avons séduit de nouveaux clients. Et bien sûr, on a beaucoup travaillé, comme savent le faire les Arméniens ». Jacques et Angèle Melkonian décident alors de se concentrer sur la mine et donnent gratuitement leur garage à leur personnel. Geste rare : « C'était une manière de le remercier pour leur dévouement ». En 1980, Continental Industries ouvre des bureaux aux

Milles. Geneviève, Marc et Christophe, les trois enfants, à peine sortis de leurs études, sont bientôt de la partie. Et se retrouvent avec l'avenir du « pont Melkonian » à écrire. « Pas simple, se souvient Geneviève. Les mines françaises fermaient dans les années quatre-vingt. Nous avions conscience que l'entreprise familiale allait perdre chaque jour de nouveaux clients ». Seule solution, tenter l'exportation : « Nous avons commencé dans les pays francophones, l'Algérie, la Tunisie, l'Afrique, précise Angèle. C'était plus simple ». En 1994, Geneviève, Marc et Christophe prennent en mains le destin de Continental Industries. Ils se lancent dans un pari complètement fou. La société est encore petite, 17 salariés, 3 millions d'euros de chiffre d'affaires. Et pourtant, ils décident de construire à 100 % leur propre machine et d'aller ainsi sur le terrain des multinationales de l'équipement minier. « Personne ne croyait en nous », s'amuse Geneviève. Sauf la Sofrem, la société de reconversion des charbonnages qui veut maintenir de l'emploi industriel sur les sites des Houillères de Provence.

350 clients dans le monde

« On était peut-être inconscients, mais le succès a été au rendez-vous ». Deux décennies plus tard tout juste, Continental Industries devenu Aramine, vend ses engins à 350 clients dans 70 pays, avec des filiales commerciales un peu partout dans le monde. Aramine Loader à Gardanne produit quatre modèles différents, assemblés à partir de pièces venues d'une dizaine de sous-traitants qui travaillent quasi-exclusivement pour



En 1994, Geneviève, Marc et Christophe ont pris en mains le destin de Continental Industries, depuis devenu Aramine.

l'usine provençale. Ces PME familiales de 10 à 20 salariés chacune implantées sur les ex-bassins miniers français comme la Lorraine auraient pu mettre la clé sous la porte si elles n'avaient pas ce précieux partenaire et client.

« Nous-mêmes, nous recrutons en permanence », ajoute Geneviève Melkonian qui, avec ses frères, emploie une centaine de salariés en direct en France et met en avant les valeurs du « Groupe Melkonian » : « Les plus anciens, de l'époque de nos parents, sont parfois même revenus de leur retraite pour coacher les jeunes ». Chez les Melkonian, la famille ça compte. Son esprit souffle et, pour réussir à percer au Niger, en Russie, au Ghana ou en Zambie face à des concurrents énormes type Caterpillar, cela semble être une bonne carte : « Nous sommes fiers de notre ancrage national et d'exporter la Provence dans le monde entier ».



À Gardanne, Aramine Loader fabrique quatre modèles différents.