#10 REP NEWS

INNOVATION
Partnership around Devulcanization

NEWS
REP Expands into Russia!

FEATURE
Energy Savings

The magazine of the REP group

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international

The GENUINE Injection Process

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Contents

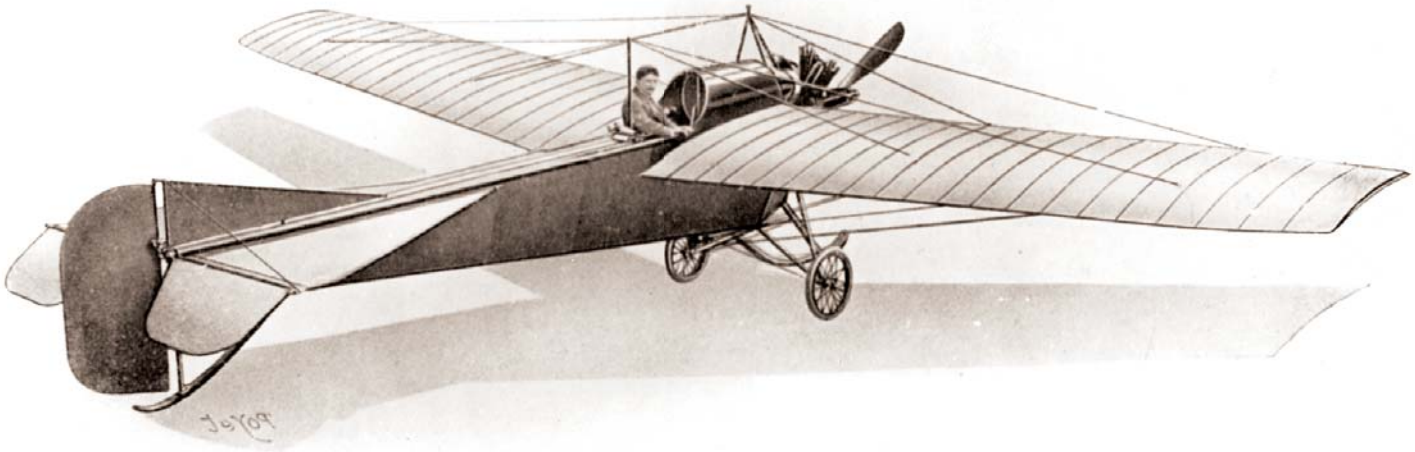
AN INTERNATIONAL PRESENCE

TECHNOLOGIES

PROJECT COMPLETION

ROBERT ESNAULT PELTERIE

AN AVIATION PIONEER AND THE COMPANY'S FOUNDER



From the very beginning, the ultimate ambition of being at the top!

Editorial

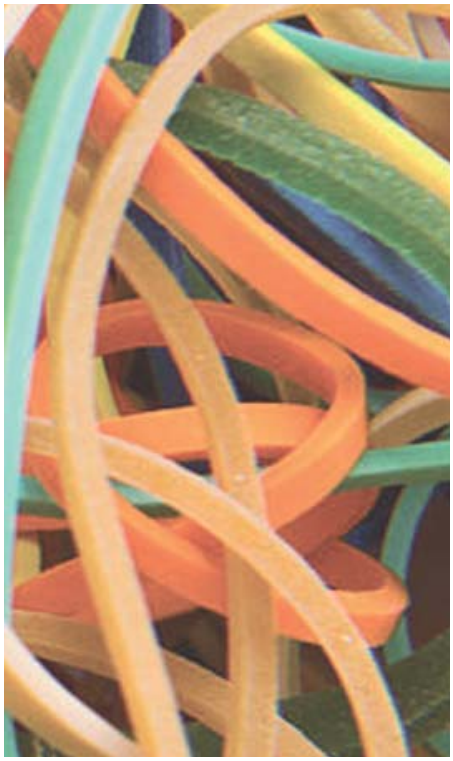
After the Crisis!

Has the world definitely changed? Yes, for the old industries of the old industrial countries. Their growth seems to go on in the more and more upcoming and promising emerging countries!

But all these extensions are based on the same foundation, the one of the experience in the development of elastomer applications, so as to benefit from the resistant, insulating, sustainable elasticity of this material.

That's why REP carried forward its projects aiming at developing competitive and sustainable solutions, globalized customer proximity and implementing measures to remedy the ongoing rubber processing problems.

"The ultimate progress finally lies in valorizing production scraps"



In a few words, a REP machine equipped with the latest driving power (Servo Dive & Drive) and thermal compound preparation (TurboCure®) solutions can expect energy savings of 70 % and its compound processing performances approach the upper limits with the wasteless (ServoBloc) and flashless tooling technologies.

Supposing the investment in such technologies cannot be financed in the near future, be it for reasons of risk, the ultimate progress finally lies in valorizing production scraps in a context of tensions regarding raw material provisioning and prices and increasing environmental constraints.

After years of assessment, REP together with its development partner Watson-Brown, launches a new, simple, clean and accessible de-vulcanization process on the market.

It's a serious rejuvenation, isn't it?

Bruno Tabar
Chief Executive Officer
REP International

An International Presence

REP, A GLOBAL ADVENTURE

Profile

They are French, German, Italian, Brazilian, American, Russian, Chinese and all work for REP International.

Their common points consist in their commitment to customer service, their expertise in the field of rubber injection and in regularly meeting at the head office of Lyon-Corbas or at big rubber trade fairs, like the K trade fair in Düsseldorf or Chinaplast.

Who are They? What are their Specific Features? Overview of a Multicultural Group!

REP, a Global Player, a Local Service

REP International

The historical head office of Corbas (Lyons) is also the main production site.
The factory, built in 1974, lives in the rhythm of the orders coming from all over the world. From the engineering of the presses to their sales, more than hundred employees are active on the site every day. In the course of years, REP company has never stopped improving its manufacturing processes and committed itself to enhancing quality and controlling the master schedule to support customer-order promising. When buying a REP press, the customers make sure they'll be satisfied: designed and manufactured to 100 % at the site of Corbas, the rubber injection presses REP G9 enjoy proven reliability.

REP Deutschland

Not very far, just on the other side of the Rhine, there is the German subsidiary, embedded in the heart of the Odenwald in Wald Michelbach where 17 employees are on the payroll. REP Deutschland, managed by **Jürgen Sauer**, sells the presses and ensures the technical support throughout a huge sector covering Germany and also the adjacent countries.

2011, year of overall records in Germany making up 25 % of the sales!

The German market is the most important market of REP with 25 % of our sales. At REP, the French-German cooperation is more than a catch phrase. 2011 was the year REP broke all records on the German market.

REP Italiana

Our Italian subsidiary was founded in 1971. It is situated close to the city of Turin.
Under the responsibility of **Roberto Sandrone,** it sells the REP presses on the Italian territory.
REP Italiana also ensures the technical support, the after-sales service and the supply of spare parts throughout this sector.

REP Materials and Technologies

Recently founded (see page 9), the Russian subsidiary is the youngest member of the REP group. Based in Moscow, it sells the REP presses on the fast growing and developing Russian market. Managed by **Dmitry Vasilyev,** until now agent on behalf of REP, it also commercializes auxiliary equipment and raw materials for the rubber industry.

REP Injetoras de borracha

The Brazilian subsidiary, managed by **Evaldo Barbosa** for 15 years, ensures the technical and sales support of the REP products throughout Brazil.

REP is strengthening its technical support in Brazil

It is located in Sao Paulo and recently enhanced its staff with the arrival of **Mauro Carvalho** as the after-sales service coordinator.

REP China

Let's continue our round-the-world trip with our Chinese subsidiary managed by **Wang Xiaobo** who has been working with REP for more than 16 years. This subsidiary is composed of a young and dynamic team who works on the local market and ensures the press support of big international groups having set up their production in the country.

REP Corporation

Let's cross the Atlantic now to discover in the State of Illinois in Bartlett near Chicago our American subsidiary managed by **Tim Graham**. The subsidiary provides the sales and technical support to around two hundred North-American customers. Equipped with a showroom and a spare parts store, REP Corporation also covers Canada and regularly welcomes expatriates from the head office for a few months or years.

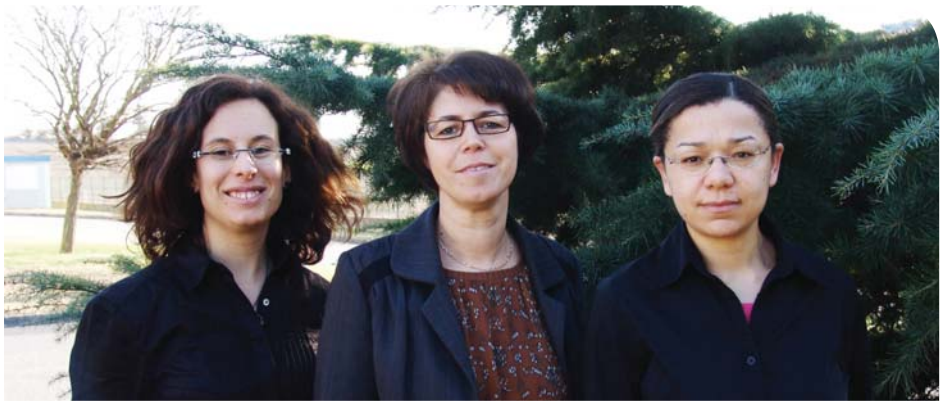
MARKET DEVELOPMENT UNIT

Who's Talking to You from France? Let's Put Faces to Names!

Managed by **Stéphane Demin**, the Market Development Unit includes the Sales Department, After-Sales Service, Process Development and Documentation. A total of around thirty employees encouraged to offer the best customer service.

Not all of them are in the field, but a few have frequent phone or email contact with the customers either for a quotation or phone support or a spare parts order.

In charge of the customer care from the offer through the order to the shipment of the press, they are always available to answer the questions of the customers and make the interface with the sales people, who are most of the time on business trips throughout the world:



Here above from left to right:
Marie RABOUIN Export Assistant (China, Asia, France, Italia, Scandinavia),
Carole LAROCHE Export Assistant (Russia, Germany, Usa),
Sandrine FAGOUR Export Assistant (Spain, Portugal, South-America, Middle East)

Once the machine has been supplied, it's up to the after-sales service to take over the customer relation for the spare part orders or technical support concerns:

As illustrated here, the multilingual team of the spare parts department with from left to right: Michel Garcia, Françoise Rudeau, Viviane Billard, Nicole Bouchet, Didier Grandjean, Cécile Delapasse, Serge Caschera, Bernard Ahronian and José Garranas (in charge of the sedentary technical support).

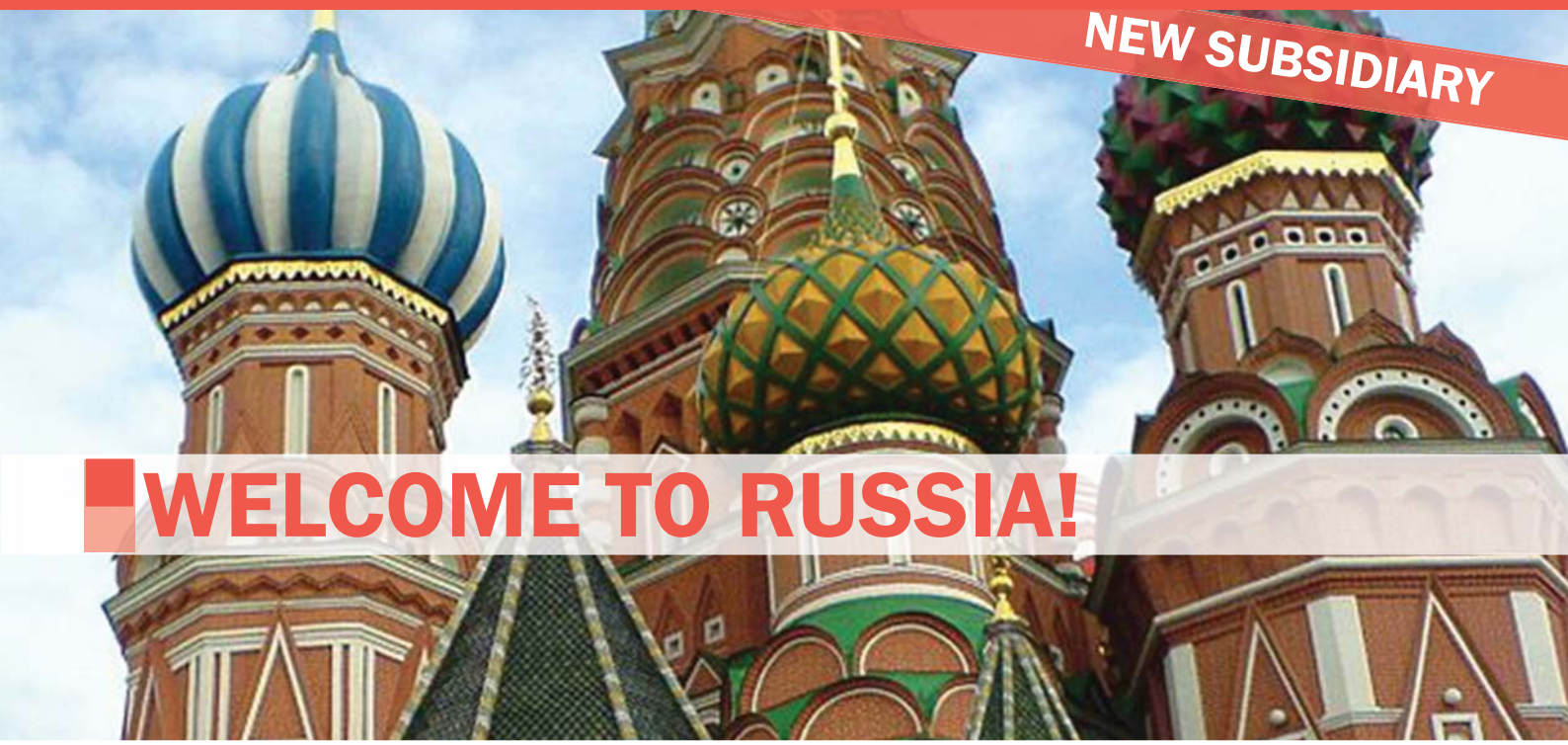
STAFF CHANGE

Michel Garcia, new head of the Aftersales Department

Michel Garcia joined REP international in 1990 as a technical support engineer, he travelled around the world for many years to install and service injection molding presses, train the users and follow the local technical teams.

Perfectly mastering the Spanish and English language, he was particularly involved in the Spanish-speaking countries like Spain and South-America.

Backed up by his proven expertise in the field, Michel Garcia has taken over the responsibility of the after-sales service and customer assistance since the end of 2011 with the support of José Garranas for the company-based technical assistance.



NEW SUBSIDIARY

WELCOME TO RUSSIA!

News

Добро пожаловать в Россию

REP Material and Technologies was founded in February 2012 on the initiative of a Russian panel of experts of Transcool Elast Company and the REP group.

Based in Moscow, the Russian subsidiary called "REP Material and Technologies" is the official and exclusive representative of REP international in Russia. Managed by Dmitry Vasilyev, former agent on behalf of REP, this new subsidiary sells REP presses on the more than ever growing Russian market, but also other auxiliary equipment and raw materials for the rubber industry (special synthetic rubber, ingredients for the manufacture of compounds).

It ensures the delivery of spare parts and the maintenance of equipment supplied by REP to Russia, Ukraine, Belarus, Kazakhstan and the Baltic states.

REP Materials and Technologies LLC

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vilchinskiy@repmt.ru

NEW SERVICE & SALES AGENCY

TEST CENTRE INAUGURATION IN BANGKOK

CENTRE WEST INTERNATIONAL Co., Ltd. Opens New Office in Bangkok (Thailand)

The agency was officially inaugurated on February 15, 2012 in the presence of many personalities among whom Mr. Minister Ros Malipon, Mr. Chan Foo, CEO of the Centre West group, Mr. Bruno Tabar, CEO of the REP group and Mr. Steven Yen, Vice-President of the TUNG YU group.

After the ritual benediction by the Buddhist monks and the official speeches, the sales team with Mr. Stéphane Demin, Manager of the Market Development Unit of REP, Pascal Consolaro, Sales Manager REP Asia Pacific region and Mr. Derek Kok Chee Hock, Sales Manager Centre West South-East Asia conducted the various consecutive presentations and demonstrations.

The new sales agency has premises for the technical team and a show-room

The new sales agency has premises for the technical team and a show-room with an RT9 press (250 tons, 2,000 cc at 2,000 bars) equipped with the unique and advanced TempInverter® and FillBalancer® technologies.

The Thai customers are now free to come and discover REP's technology and make test runs with their molds.

Strengthening the local support in this global region and coaching the customers in their development that's the job of this new representation of the REP group.

Address of the new Thai representation:

CENTRE WEST

CENTRE WEST INTERNATIONAL CO. LTD
298 Bangna-Trad Rd,
Bangna, Bangkok 10260
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Partnerships

REP- TUNG YU, THE RANGE IS EXPANDING

A Successful Partnership

After 8 years of experience, the REP-TUNG YU collaboration remains more active than ever and the success proves the profit drawn from common developments.

After having launched the RT9-250 in 2010, REP and TUNG YU have launched the RT9-400 (400 tons) in 2011 and will launch two new models in 2012: the ergonomic RT9-400 (lowered work top) and the RT9-150 (150 tons).

THE RT9 IS THE SIMPLIFIED SOLUTION TO ENABLE THE EMERGING MARKETS TO TAKE ADVANTAGE OF THE REP PERFORMANCE.

The RT9 combines the genuine injection technology of REP and the closing units of the Tung Yu presses, which means:

- Y-type injection unit with separate extrusion and injection functions
- 2-stroke or 3-stroke closing unit
- Proportional closed-loop control

Of modular design and reduced space requirement on the floor, the RT9 presses are ergonomic and easy to maintain thanks to their access from the back side.

A 400-ton machine with lowered work top is now available. They are equipped with a CE cage for ultimate safety.

Finally to complete the range, the RT9 exists in J-version, which means with reduced layout, even more compact and sword-type fastenings to meet the requirements of the Japanese market.

8 YEARS OF TECHNICAL AND MARKETING COOPERATION BETWEEN REP AND TUNGYU!

Since 2004, REP and TUNG YU have united their respective technologies to create a new range of rubber injection presses, combining REP's technical expertise in the field of injection with TUNG YU's low-cost know-how.

DEVULCANIZATION

REVERSED VULCANIZATION REACTION

Tomorrow, runners, tear trims and other production residues will be raw materials for direct recycling into production rather than waste!

Watson Brown HSM

2 industrial plants:

Watson Brown HSM (Canada) Ltd in Mississauga (area of Toronto) in Canada

Watson Brown HSM GmbH in Mahlow (area of Berlin) in Germany

REP and Watson Brown Found Business Partnership

Reversing the vulcanization has been for decades perceived to be an irreversible reaction. This was before relying on Watson Brown who have developed a patented solution[1], the "HSM[2] devulcanization technology" allowing for the reversal of the rubber vulcanization process.

The HSM technology is a "green" process without chemical additives breaking the bonds between the macromolecular chains without degrading them contrary to the milling techniques.
After the processing of the rubber scraps inside the recycling plant, regenerated material is recovered, which can partly replace the original material within a new batch.
This process allows reintegrating quantities, which are similar to the scrap rate generated by the processes without downcycling the characteristics of the compound.

Always concentrating on new complementary technologies to make available to its customers, REP understood that this process is a future solution for all rubber-involved industrials facing the increase in raw materials and the huge pressure to reduce their scrap rates.

Considering the shortage in the rubber market with supply unable to keep up with rapidly growing demand, particularly from Asia or India, there is no doubt about the promising future of devulcanization centres.

REP and Watson Brown think about opening an international devulcanization network in the very near future

REP therefore decided to found a partnership with Watson Brown who is operating 2 plants in Germany and Canada, so as to offer its customers a solution to devulcanize their production residues and other scraps generated during the rubber production process.

REP and Watson Brown think about opening an international devulcanization network in the very near future close to the customers' production sites or grant licences to those who would like to integrate this technology.

Once again, REP concentrates on enhancing the competitiveness of its customers by offering new ideas!

[1] Patent no.WO03014206 (A1): "This invention concerns a process used to process (recycle) reticulated elastomer materials and consisting in exposing such a material to mechanical stress inside a processing unit to devulcanize one part of said material under a mechanical-chemical process. The processing operation is controlled in such a way that one predefined part of the non-processed material remains vulcanized in form of granulates, in order to generate a liquid material including vulcanized elastomer granulates dispersed inside a devulcanized elastomer matrix".
[2] HSM: High Shear Mixing.


Technologies

CRB: THE REVOLUTION OF ELECTRIC VALVE GATES

Advanced Tool Solution

The "Cold Runner Block" systems, also called "CRB", are used in injection molding processes to feed the compound as close as possible to the cavity by limiting so far the formation of runners or sprues. During the past 10 years, small nozzle shut-off was more and more developed, first using pneumatic and then hydraulic control systems.

But these systems do not always allow for the full control of the valve gates.

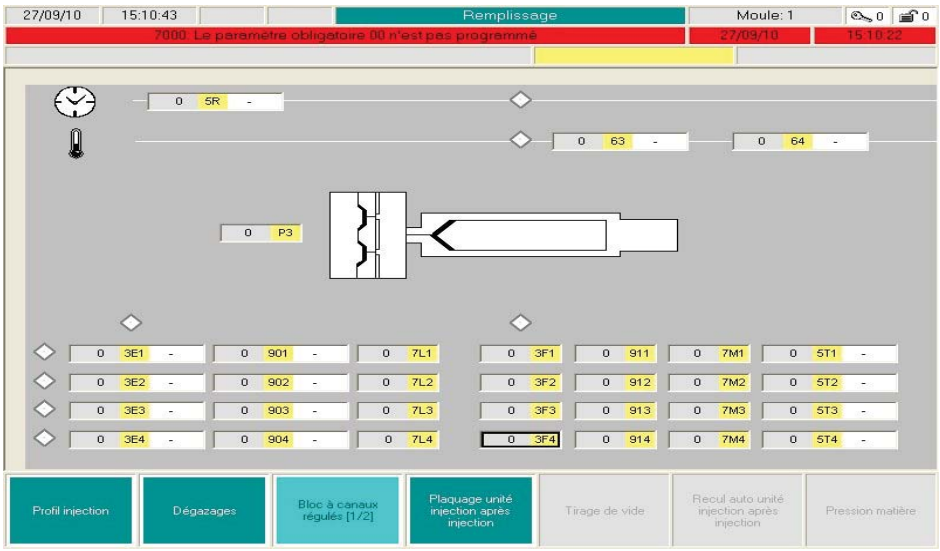
Continuously focusing on higher technical performances and process improvement, REP has been offering the so-called ServoBloc tooling solution since 2010: the electric valve gated Cold-Runner-Block.

A Unique System Throughout the World

The ServoBloc is an electric valve gated Cold-Runner-Block for elastomers and liquid silicone (LSR). Until now unrivalled in the market place, this exceptionally highly flexible system in use allows for unparalleled precision in the injection process of compounds largely varying in both hardness and viscosity.

The ServoBloc system is equipped with needle-type valve-gated nozzles controlled by an electric cylinder.

The valve gate control is fully integrated in the control system of the REP press. The speed or position parameters of the valve gates can be changed directly from the touchscreen of the press!



The Disadvantages of Traditional Systems

Regardless of whether talking about pneumatic or hydraulic cylinders, in both cases the nozzle opening/closing speeds and times are not controlled, thus leading to a loss of precision.
Moreover, pneumatically shut-off CRBs are compatible with soft rubber types only. As the opening and closing strokes are fixed, it is impossible to adjust the compound flow and it is necessary to use the times between the different nozzles for compensation.
Finally, there is a risk of hydraulic leakage and compound pollution due to the hydraulic cylinders, pipes and couplings.

The Benefits of the ServoBloc

In comparison to other systems, this needle-type electric valve-gated nozzle system has a lot of advantages.
A sensor indicates the precise position of the needle at any time, thus allowing for full control.
The valve gate opening and closing speed can be set and changed depending on the needle position. Therefore the speed trend is under closed loop control for each nozzle valve gate.
Contrary to cylinder-driven systems, shut-off is not reversible if the motor stops: the needle position remains fixed.
The opening position can be set using different values for each small nozzle, in order to adjust the compound flow at the part infeed and consequently control the compound throughput and heating.

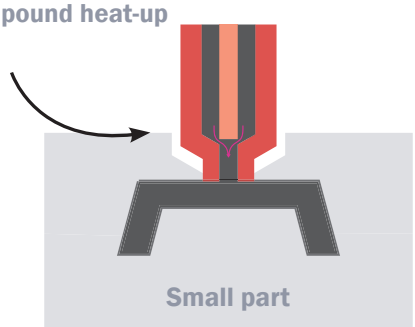
One Step Ahead

The resolutely modern, clean and economic technology of the ServoBloc is matched to a broad range of soft or hard rubber types, from silicone to FKM. Adaptable to a wide range of applications, it is fully integrated in the injection molding press, thus resulting in a particularly flexible use and allowing for the sequential control and closed loop speed and position control of the needles, which in turn translates into a perfect quality of the injection point, higher reliability of the injection process and compound savings.

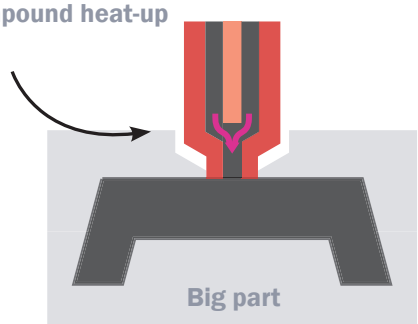
Like in many fields where fully electrical options stood the test of time, the electric valve-gated CRB should set the standards in the field of shut-off type CRBs. Introducing the ServoBloc, REP offers its customers the opportunity to keep one step ahead!

Valve gate opening during injection

Small opening =
Low flow rate =
High compound heat-up

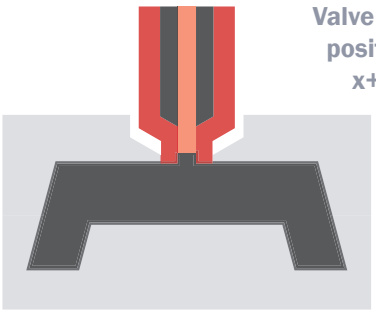


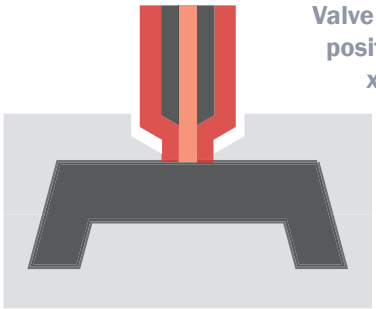
Large opening =
high flow rate =
Low compound heat-up

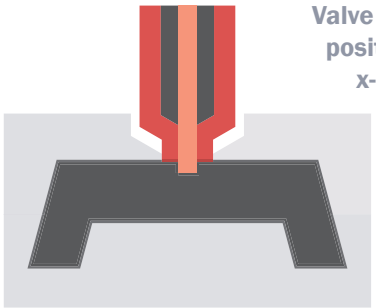


The valve gate position is adjustable with a precision of 0.01 mm directly from the interface

Vavle gate closing at the end of injection







REP PRESSES: MACHINES COMBINING ENERGY-SAVINGS AND PRODUCTIVITY!

Considering the increase in energy costs, the more and more stringent environmental standards and the additional EN16001 certification[1] the companies' energy control has become a capital stake.

Energy-related efficiency may therefore be a substantial factor for reduced installation costs and enhanced competitiveness. Machine tool buyers were not wrong so far: Energy saving from now on belongs to the specifications.

Concerned about this debate for many years, the REP group proceeded with an energy-relevant assessment of its presses, so as to enable its customers to considerably reduce their consumption.

First of all remember that this problem is significantly different between a rubber injection press and a plastic injection press.

What's so different?

When talking about a rubber injection press:

- The curing process takes place inside a hotter mold (approximately 200 °C) during a "long" time
- The injection pressure holding time is also longer

Did you know?

33 % of the global energy consumption, all types of energy together, are dedicated to industrial production. This figure makes out 40 % in all European countries. Depending on the industrial sectors, energy requirements of the machine tools may amount to 68 %!

[1] ISO 50001:2011 Energy Management Systems – Requirements and recommendations for implementation

Some History...

In the 90ties, the hydraulic pump unit was the most energy-consuming factor on a rubber injection press, followed by the mold heat-up and the injection unit heat-up.

The total electric energy consumption of the REP presses has been reduced by 40 % between the G7 (1996) and the G9 (2005). It has further been reduced by 45 % between 2005 and 2012 thanks to innovating systems like Servo Dive & Drive or TurboCure®.

The most energy-saving results have been reached in the part consumed by the hydraulic pump unit, by now only representing 30 % of the total consumption of a G9 press.

How could REP Reach such Results?

The power of the hydraulic pump unit is inherently linked to the injection unit, in order to benefit from the full power of the machine during the dynamic injection phase.

Don't forget!

To compare the machine performance, we must also compare the size of the pump (displacement, pressure) and the size of the electric motor (power) which must be in line!

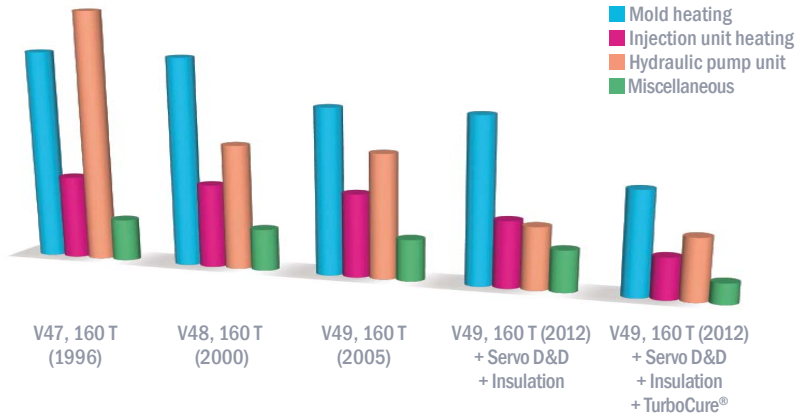
Let's take the example of a pump capable of delivering 63 l/min at 250 bars on a 250-ton press for an injection capacity of 2,000 cc at 1,500 bars. If the process requires a dynamic injection at maximum speed and maximum pressure, then the theoretical power required on the hydraulic pump unit will be:

P x Q = 250 bar x 63 l/min x 1/600 = 26.25 kW

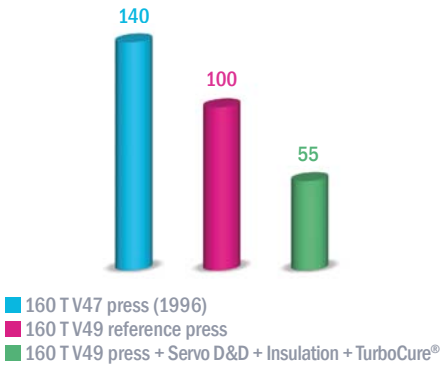
REP provides its presses with a motor capable of delivering this power during the injection. Certain manufacturers equip this type of press with 15 kW motors. In this case, the motor is largely under-dimensioned and therefore won't lead to the same speed/pressure performances during injection, thus penalizing overall productivity.

COMBINING BOTH SYSTEMS SERVO DIVE & DRIVE AND TURBOCURE®, PRODUCTIVITY IS INCREASED BY 100 % WHILE REDUCING THE ENERGY COST OF EACH PART PRODUCED BY 70 %!

BREAK DOWN OF THE ACTIVE POWER ON A REP RUBBER INJECTION PRESS BY MOLDED PART



COMPARISON OF THE ELECTRIC ENERGY CONSUMPTION OF REP PRESSES OF GENERATION G7 TO G9



COMPARISON OF THE ANNUAL ENERGY CONSUMPTION ON A 160-TON PRESS WITH OR WITHOUT SERVO DIVE & DRIVE AND TURBOCCURE®

Type of press (160 tons)	V47	V49	V49 + Servo D&D	V49 + Servo D&D +TurboCure®
Year	1996	2005	2012	2012
Number of cycles performed in 5,000 hours	65,000	67,700	67,700	**132,300**
Total electricity cost[2] /5,000 hours	6,424 €	5,466 €	3,230 €	3,891 €
Total electricity cost[2] /100,000 cycles	9,882 €	8,069 €	4,767 €	2,942 €

[2] at 0.12 € per kW.h in average, average cost of industrial electricity in the European Community. Reference month November 2011.

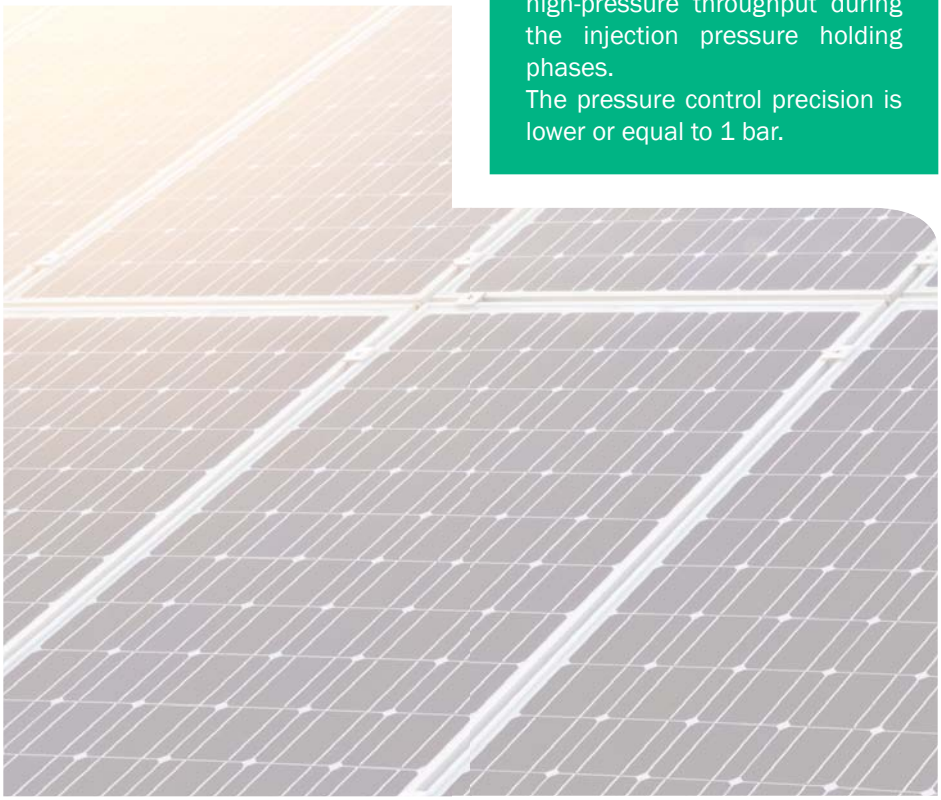
What Type of Systems Were Currently Used?

The most energy-consuming but decreasingly used system is the fixed displacement pump with proportional P/Q block. But forget it, as this system has no longer been used by REP since 1997.

A revolutionary system in the years 1990 to 2000, the variable displacement axial or radial piston pump such as used on the G8 REP presses led to energy savings of around 50 % in the power consumed by the hydraulic pump unit.

Supported by the new green revolution was then introduced the fixed displacement pump and variable speed motor. This new technology leads to additional energy savings of around 40 % in the active power and almost 100 % in the reactive power. The last point should not be neglected, as it may represent an important drop of the electricity bill.
However, the motor heating associated with the pressure holding phases during the static injection phase (speed close to 0) remained difficult.

Did you guess correctly?
It's this particular rubber injection inherent phase that is today limiting the development of 100 % electric solutions.



The Current Solution Servo Dive&Drive (2010)

Oil-immersed motor-driven pump unit

For the first time shown at the K2010 trade fair in Düsseldorf, Servo Dive & Drive is an electric-hydraulic solution combined with temperature eco-management.

Based on a servomotor and a fixed displacement pump optimized for variable speed, this solution perfectly works with very low rotation speeds during the rubber process inherent injection pressure holding phases.

How Does it Work?

One single motor and one single optimized pump manage both high throughput at high pressure during the dynamic injection or press closing phases and low high-pressure throughput during the injection pressure holding phases.
The pressure control precision is lower or equal to 1 bar.

Its performances under these conditions exclude too complex solutions with several pumps of random reliability, as there are too many different components.
Apart from its low energy consumption, this innovation has numerous advantages regarding reliability and easy maintenance.

Servo Dive & Drive is an oil-immersed system allowing for natural pump cooling. That means no more need for water and fan. The cycle time is reduced thanks to faster responsiveness, its particularly low inertia grants the pump high velocity.

As far as reliability is concerned, the Servo Dive & Drive system also allows for improvements, namely a better intake. Almost no moving parts and optimized lubrication of the mechanical parts.

Unlike traditional solutions, the mechanism is very simple: No need for complex hydraulic components (no proportional electrovalves, the use of hydraulic pipes is reduced to a minimum).

What is a Servomotor?

A servomotor is simply composed of a brushless motor and a variable speed drive contrary to a traditional system including an asynchronous electric motor, a hydraulic pump and a hydraulic circuit.

At equal sizes, a servomotor develops a three times higher power!

The variable speed drive includes the electronic hardware required for the motor control. It manages the pressure and dynamics of the pump. Compared to a traditional hydraulic solution, maintenance is largely simplified and energy consumption reduced by more than 50 %.

This absolutely reliable technology initially used in the military field has been largely proven and is currently used today in the field of robotics and aeronautics.

Let's further point out that the solution developed by REP does not require to empty tank for maintenance purposes.

Ultra-compact monobloc solution, the system requires minimum space thus allowing for easy integration into the machine. Moreover, the noise level is reduced versus traditional motor-driven pump units.

Thanks to innovations like Isothermould, TurboCure®, etc., REP enables its customers to increase their productivity by 50 % versus a traditional solution.

With REP Choose Energy Efficiency!

Over the course of years, REP has developed various eco-energy solutions contributing to reduced operation costs in its customers' plants and consequently to enhanced productivity.

Energy efficiency has become the driving force of innovation and with REP's G10 press generation nobody doubts the highlight of intelligent energy at the coming K2013!

If the machine produces two times more per hour with the continuous mold heating, the energy consumption per part produced is reduced by half.

Though the consumption of the hydraulic unit was considerably reduced over the past years, REP presses also make the difference by using highly efficient temperature control systems in the injection unit and mold heating areas.

The 3 Energy-Saving Key Areas on the Press

The hydraulic pump unit

- Servo Dive & Drive

The injection unit

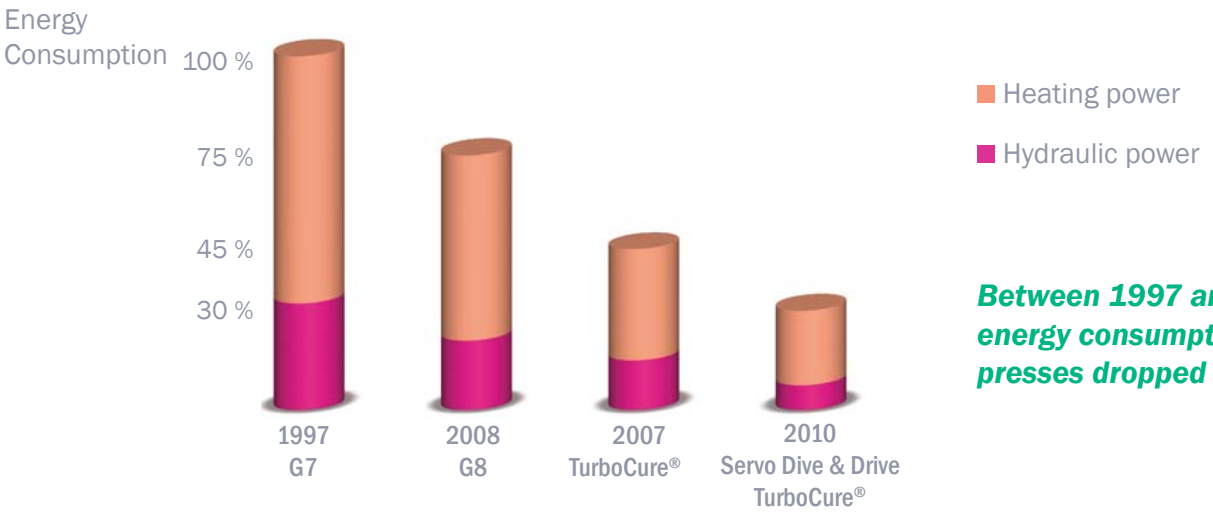
- Optimized controller
- G9 PLC unit with built-in PID temperature control loops
- Insulation system
- TempInverter® of TurboCure®

The mold

- Optimized CRB circulating pump
- Thermotrac® (PID)
- Isothermould
- FillBalancer® of TurboCure®

REP innovations

REP: Energy Efficiency as Driving Force of Innovation!



Between 1997 and 2010, the energy consumption of the REP presses dropped by 70 %

TURBOCURE® AND THE FILLING BENEFIT

Customer Tests Revealed Multiple Benefits!

The TurboCure® solution - don't forget - REP was awarded the AFICEP prize of innovation in 2008 and Beaumont Technologies the Best of Erie Award 2009, allows for reduced cure time by 50 %.

Looking Back on a Patented Solution

The global solution, called TurboCure®, is made of 2 different modules: TempInverter® inside the injection unit is used to reduce the cure time by up to 40 % whereas FillBalancer® at the runner division is used to reduce the cure time by up to 42 % thus improving quality, scrap rates and labor costs.

These 2 modules, which can be implemented together or individually depending on the application, can be easily integrated into the process while observing the integrity of the compound.

A Commercial Success

With more than 230 licenses sold, both modules have been largely proven for 2 years. Reduced cure times, the major benefit of this system, could have been documented in a large number of productions with a payback period generally reached within a few months. Certain particularly satisfied customers didn't hesitate to equip their machinery, and their feedback enabled us to establish valuable statistics regarding the number of mold cavities or the compound used; statistics, which revealed another undeniable advantage of the FillBalancer® module in terms of filling balance when using multi-cavity molds.

The Brainteaser of the Multi-Cavity Mold Inherent Imbalance

All rubber molding experts know about the difficulty of engineering 3, 6, 12, 24 or 48 cavity molds.

A mold of 16 cavities for instance will have a natural imbalance of 15 to 25 %, whereas a mold of 12 cavities will have a natural imbalance of 25 to 35 %.

The FillBalancer® technology allows for huge progress in this field, as - based on pictures and figures - confirmed by **John Mohl,** Sales Manager of REP Corporation in the United States, the country with the most FillBalancer® licenses having been sold.

John Mohl, how do you explain that?

J.M.: The most current number of cavities for a mold is 4, 8, 16. FillBalancer® will certainly improve the balance for a mold of 4, 8 or 16 cavities (imbalance in average reduced from 15 % to 3 or 4 % with FillBalancer®), but in certain other situations where 12-cavity molds are implemented, the benefit will be even more significant. For instance in certain customer plants it was possible to reach an imbalance of around only 6 % with FillBalancer®, whereas we would have stated approximately 25 % without the system!

To what extent does this system contribute to enhanced productivity?

J.M.: Thanks to FillBalancer® it is now possible to make full plate molds (more cavities by namely passing from 8 cavities to 12, provided the size of the plate and the clamping force make it possible) while granting the balance between the different cavities.

You've got quite promising pictures from a customer...

Natural curing

Curing With TurboCure®

J.M.: Yes I have, these pictures show a part cured with and without TurboCure®, on the left cavity 2, on the right cavity 8, where you can clearly see the impact of the natural imbalance when TurboCure® is not used.

Apart from reduced cure times and improved balancing, what are the other advantages of FillBalancer®?

J.M.: Customer surveys highlighted many reasons for satisfaction: reduced flash and scrap rates, reduced part finishing operations (easier trimming), compound savings (leakages and flash), improved homogeneity of the part characteristics among the cavities. Another benefit to point out is the reduced operator time on press, since there is less mold cleaning required, resulting in reduced global cycle times. FillBalancer® leads in this particular situation to a reduced cure time by approximately 40 % while granting intact mechanical part properties (equivalent static and dynamic rate sweep results between a cure time of 3:30 min without FillBalancer® and a cure time of 2 min with FillBalancer®).

TurboCure®

FillBalancer® in the mold

FillBalancer® is based on a global patent of Beaumont Technology Inc., implemented in the thermoplastic technologies for many years under the trade name MeltFlipper®.

The shape of the runners is highly dependent on the mold configuration and varies depending on the sprue separation effect and on the number of cavities. Beaumont has a large experience in the design of those shapes and REP has the know-how in rubber specificities: together these two companies offer a solution that combines the ingeniousness of the most appropriate shape for a given application and the license needed for this type of technology.

TempInverter® in the injection unit

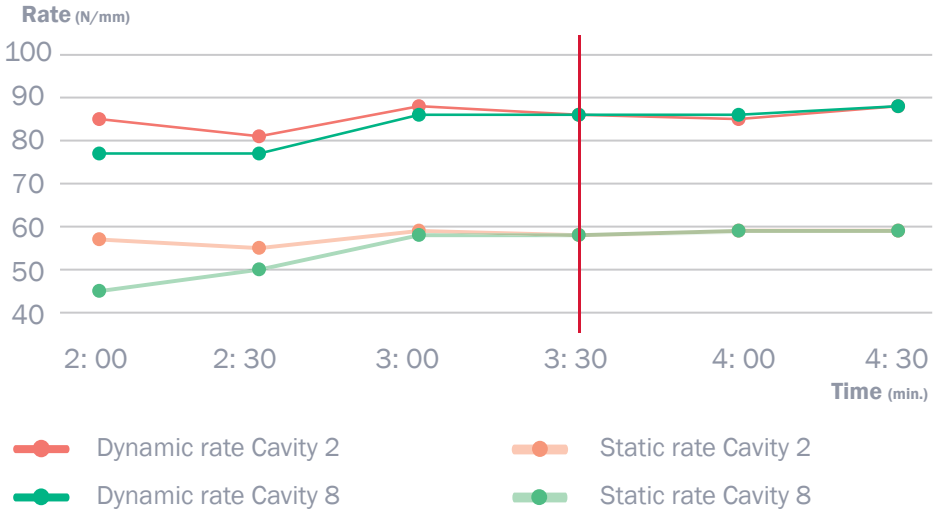
The TempInverter® solution consists in increasing the inner temperature. It drives the outer compound to the centre of the flow and reciprocally the inner compound from the centre to the outside.

This system is implemented upstream of the nozzle, as at this stage, the outside temperature has already increased (at the nozzle entry), so as to direct the outer compound to the centre of the flow. This will increase the temperature in the centre by about 10 °C.

Before

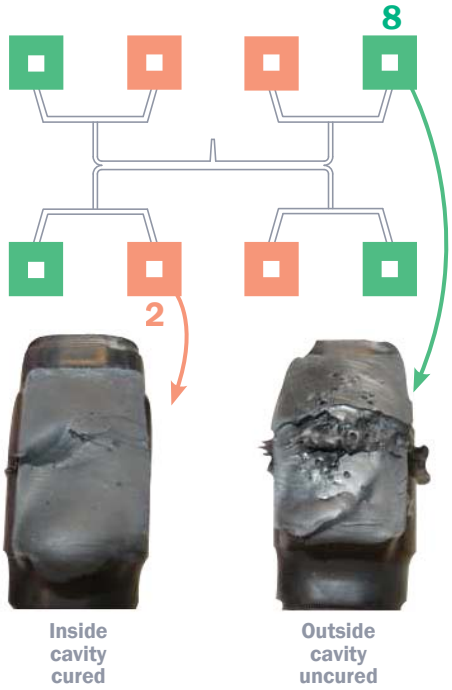
RATE SWEEP RESULTS: before FillBalancer®

Geometrically Balanced Runner Dynamic & Static Rate Sweep Results



CURE STATE: before FillBalancer®

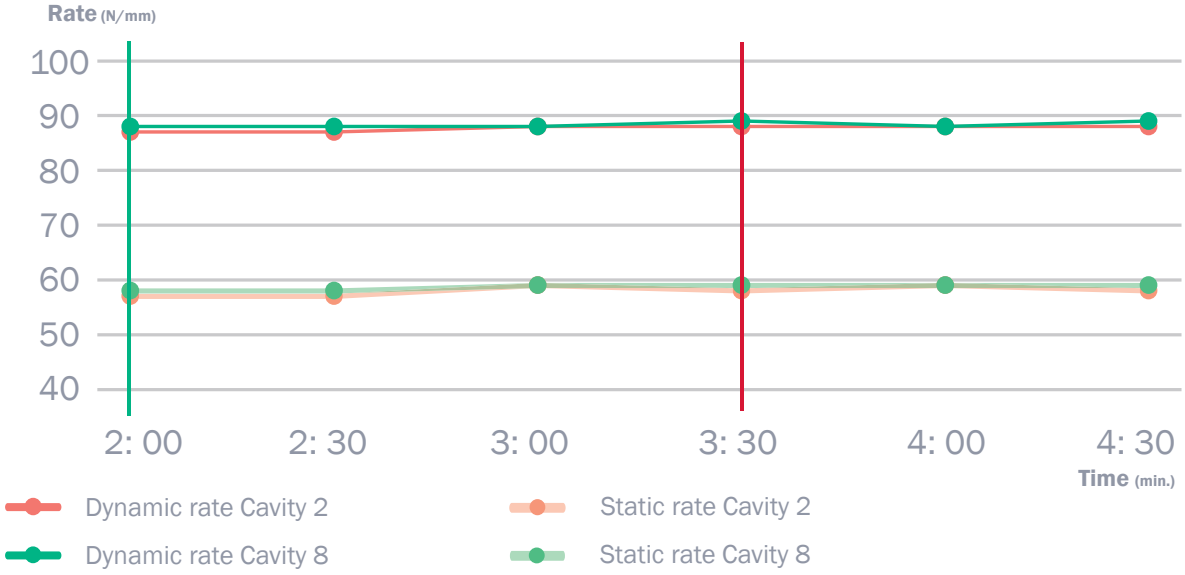
Cure Time Interval = 2:00 min.



After

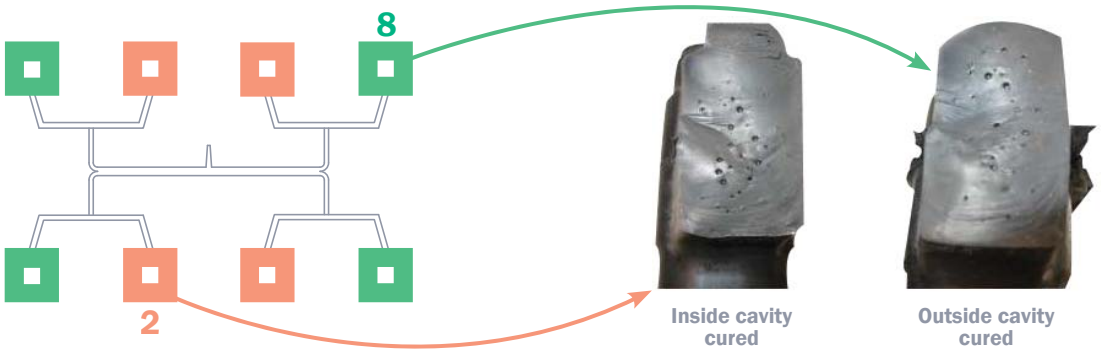
RATE SWEEP RESULTS: after FillBalancer®

Rheologically Balanced Runner Dynamic & Static Rate Sweep Results



CURE STATE (Rheologically Balanced Runner)

Cure Time Interval = 2:00 min.



NEW RELEASES AT BOTH ENDS OF THE G9 RANGE

V19: REP's C-Frame Machine!

MACHINE SPECIFICATIONS	V19E	V19H
Forces		
Clamping (kN)	255	400
Closing (kN)	55	80
Opening (kN)	55	80
Strokes		
Opening mm	375	375
Mold thickness mini/maxi	55	125
Heater plates		
Width x length mm	300 x 300	435 x 300
Working height mm	1,000	1,050
Injection unit	Y125 or P01	Y125 or P01

Of course, like every REP machine, this model meets the latest EC safety requirements (directive 2006/42/CE; standard EN201: 2009)

With minimum space requirement and ultimate accessibility, the V19 is a top-of-the-range C-frame machine for plastic or rubber injection, available in two versions: V19E (26 tons) or V19H (40 tons).

Its "C-Frame" structure with closing from the top permits operator access on three sides, which is essential for all profile welding or extruded hoses applications.

It may be equipped with a P01 injection unit for plastic injection (TPV) or with a Y01 injection unit for rubber molding. The V19 is especially characterized by its very low space requirement.

H59: The 300-ton Version of REP's Horizontal Presses

Low floor-space requirement and low ceiling requirement, easy removal of the molded parts, optimized cycle time and 100 percent automation are the key features of this press, which completes the G9 horizontal range.

MACHINE SPECIFICATIONS	H59
Forces	
Clamping (kN)	3,000
Closing (kN)	79.5
Opening (kN)	76
Strokes	
Opening mm	450
Clamp maxi. useful mm	18
Mold thickness mini/maxi	200 / 450
Heater plates	
Width x length mm	550 x 550
Injection unit	Y1000 or Y2000

Injection Units	Vertical Presses									Horizontal Presses	
	V19	V29	V39	V49	V59	V69	V79	V89	CMS	H49	H59
Y125	X	X									
Y400			X	X							
Y1000			X	X	X	X			X	X	X
Y2000					X	X	X	X	X		X
Y5000						X	X	X	X		
Y8500						X	X	X			
Closing force	26 or 40 T	50 T	110 T	160 T	260 T	400 T	500 T	800 T	160 T	190 T	300 T

Project Completion

REP MEETS HIGH-LEVEL TARGETS!

Whether Specials or Customization or Automation, REP Will Move Mountains to Meet Customers' Specs!

Ambitious project for the modernization of the machinery like with BRT from 2008 to 2011 or special fully automated multi-station press inquiry with particular constraints, the technical teams of REP are always ready to accept the challenge.

Laurent Terrier, Head of the technical department and machine development, was so kind as to answer our questions.

What is the proportion of special machines leaving the REP workshops?

L.T. Slightly more than every second machine. It's further interesting to know that our special presses are CE certified, if the CE safety level is requested on contract award.

Is the R&D department of REP able to cope with all special customer requests?

L.T. Yes it is within the current technical limits, but we never undertake to propose a solution if we are not sure to finalize it.

Are the terms of engineering and manufacturing longer in such cases?

L.T. Manufacturing times are certainly slightly longer, but hardly more, since the engineering and manufacturing of the special part will take place in parallel with the construction of the basic press. We also propose on a regular basis technical upgrades on presses, which have already been supplied, if the customer needs to match it to a new production.

Due to the relocation of important groups, the presses travel more and more; how do you handle the follow-up of special files?

L.T. Our strength consists in being able to find the customized part developed for a press, which has been delivered for more than 20 years, in order to reproduce these customizations on a new machine, if the customer needs it.
It happens indeed quite often that inquiries are repeated, but sometimes several years later.
We care a lot about keeping the technical files of the customer machines up to date, even in case of after-sales related modifications.

Could you please give us a few examples of specific presses? What are their particularities, what does the technical difficulty of the project consist in?

L.T. I will start by talking about the S60, which we are realizing for a German customer.
It is a bi-compound flange-type machine with 2 injection units of 2,700 bars (70 cc): One vertical injection unit and one horizontal lateral unit.
The press is optionally equipped with top and bottom ejectors and a simultaneous double plate stripping kit.

The difficulty of this project consists in both the specific closing unit type (60 tons, closing from the top) and the integration of all elements into a small-sized press (mold 300 x 300).

Another bi-compound machine, the V59 ordered by another German group: typical case of most special files, the job consists in upgrading a standard model, in this particular case a 250-ton V59 model with injection unit Y10.
The upgrade consists in increasing the injection pressure to 3,000 bars (500 cc), in integrating a second smaller lateral injection unit (110 cc / 2,700 bars) for simultaneous bi-compound injection and many other specificities: pre-arrangement for CRB with valve-gated nozzles, multiple heating areas, communication with external systems, electrical sockets, pneumatic back guard, interface and control panel distant from the electrical cabinet by more than 5 meters)

"Bi-compound injection is a current technique implemented by REP on all types of machines in all configurations ..."

Bi-compound injection is a current technique implemented by REP on all types of machines in all configurations (injection from the top, the bottom, the left side, the back side, ...). We have realized machines with up to 4 simultaneous injection units of 25 liters, i.e. 100 liters (1,500 bars).

There is no major technical difficulty in this project so far, which has been developed together with our German subsidiary REP Deutschland. The most important feature is sometimes to understand the customer's need to meet all his project-specific requirements.

I can now talk about the S03/S05, a press of 300 or 500 tons with an injection unit Y10 or Y20, developed

"the critical point on this type of application is to calculate the suitable stiffness of the closing unit ..."

S05 (500 tons)

in the framework of a special Spanish customer inquiry for the molding of big flat gaskets.
The critical point in this type of big flat gasket applications is the stiffness of the closing unit due to the wide platens of reduced depth for easy access of the operator. Our means of calculation make it possible to ensure the suitable stiffness: in this particular case, we've designed a column-type closing unit with several closing cylinders and specific traverses for optimized stiffness.

"We have been producing presses for bladder molding for more than 20 years ..."

Also, we cannot talk about special machines without mentioning the S22 Bladder for another Spanish customer. REP has already built many special presses of 1,000 to 2,200 tons for the production of bladders. We regularly upgrade our standard model V89 (800 tons) for this type of product.
The bladder upgrade itself is not a problem. It is under control, since we have been producing this type of presses for more than 20 years. The first press of 2,200 tons even dates from 1992 with 2 injection units of 15 liters!

For this 2,200-ton press with an injection unit of 25 liters (1,500 bars) and mold dimensions of 1,400 x 1,400 x 1,000 mm, the real challenge lied in the dimensions and weight of the parts (traverse of more than 16 tons, 6-meter columns, injection cylinder of 415 tons): difficult handling (need for a crane for the erection of the closing unit), provisioning of the steel types, shipment.
This machine is the first CE certified press of 2,200 tons in compliance with the new directive 2006-42/CE.

Can you say a few words about the CMS? Its origin? Its advantages?

L.T. The idea of the Compact-Multi-Station originates from the SACOMAT rotary machine principle with 1 injection station, several curing stations and a stripping station (a total of 6 to 12 stations).

"The compact multistation machine combines productivity, flexibility and ergonomics."

It was decided to produce a standard multi-station injection press, which should neither be impaired by the heaviness nor the cost of the big rotary machines while ensuring high productivity.
The CMS has many advantages: direct effort under the mold, comprehensive and extendable stripping station, injection unit Y10, Y20, Y50. This very compact machine combines productivity, flexibility and ergonomics.

The full energy of REP's technical department is dedicated to the customers to meet their today's specific need or to supply the standard press of tomorrow.

CMS (160 tons)

COACHING AND EQUIPMENT

To Meet Customers' Requirements for Turnkey Solutions, REP Offers Full Service Packs

Tooling supply (cold runner blocks, ServoBloc, mold) and peripherals, commissioning, installation, mold development and testing, process engineering, training, coordination of projects conducted with other partners, as many opportunities to seize for the Process Development and Application department.

That's what **Matthieu Wolff,** Head of the Process Development department, is going to explain to us.

Matthieu Wolff, what does the job of your department consists in?

M.W. The objective consists in accompanying the customer and supporting him in fulfilling his project. If there is one link missing, the project cannot be realized. We provide the customer with this link. This means from the basic advisory service to the turnkey delivery of the machine including the mold and the process control system.

"The objective consists in accompanying the customer and supporting him in fulfilling his project."

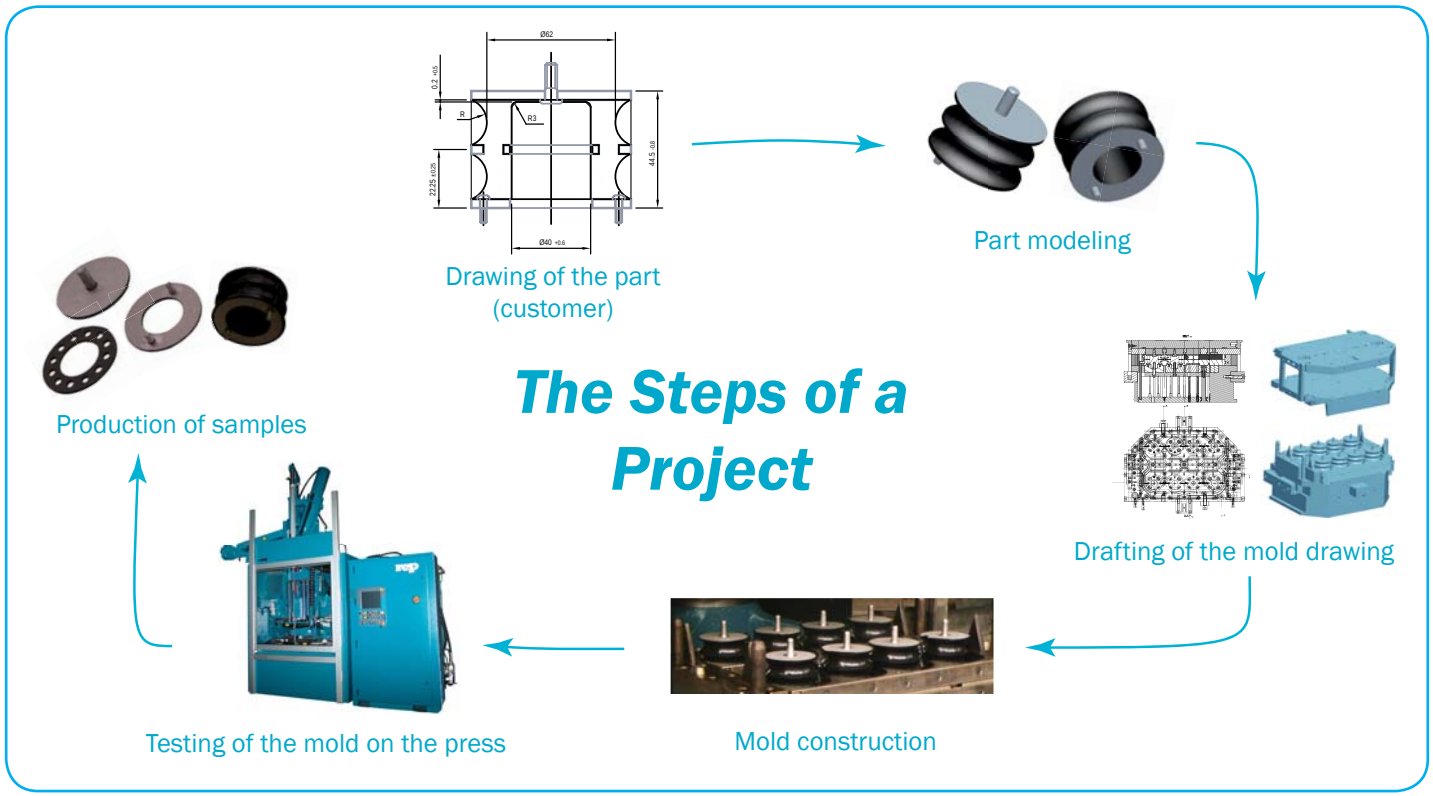
What are the most frequent services provided by your department?

M.W. We run compound analysis tests, we perform molding principle studies thanks to our database containing more than 13,500 studies.
Providing mold drawings, making molds and/or CRBs, testing tools and commissioning in the customer plant belong to the current jobs of our department. We further conduct training sessions in the premises of REP or on the customer site, consulting (process optimizing support) and expertise. Finally, we sometimes support multi-partner project management, especially as part of turnkey projects.

Matthieu Wolff, you recently coached 2 large-scale projects, which particularly make evident the ability of REP to provide the customer with global solutions.
Can you tell us more about these projects?

M.W. First of all I will talk about the Balakovo project: Within the scope of the sales contract of around thirty machines to a Russian customer located in Balakovo, we were also entrusted with the delivery of 39 cold runner blocks and 74 molds.

Based on the part drawings and production volumes provided by the customer, we had to rely on our experience to define the number and the



type of machines required to achieve the specified production as well as all mold principles.

To finalize this project, the entire project scope had to be taken into account by starting almost from zero: modeling of the part starting from hardcopy drawings and definition of the compound shrinkage after compound testing at REP, on-site assistance in Russia for production increase after sampling test runs at REP, project management, planning and communication with the other contractors.

This project shows the ability of REP to provide the customer with a comprehensive large-scale solution. Is the project finished today?

M.W. Yes it is. All project sections have been supplied. The customer was fully supported by us up to the commissioning of a production workshop. This project was not only a full success, but also an unparalleled human experience for our technicians, who spent many weeks on the customer site in Russia.

"... the customer was fully supported by us up to the commissioning of a production workshop."

ГАЗЕТА ОТКРЫТОГО АКЦИОНЕРНОГО ОБЩЕСТВА «БАЛАКОВОРЕЗИНОТЕХНИКА»

ПРОГРЕСС

БАЛАКОВОРЕЗИНОТЕХНИКА

Издается с июля 1974 года

№ 1 (1933)

ВТОРНИК 17 ЯНВАРЯ 2012 ГОДА

Телеграмма в номер

ПАРТНЕРЫ ВЫСШЕГО РАЗРЯДА

Уважаемые участники проекта "REP-Балаковорезинотехника"!

В связи с приближающимся завершением проекта "REP-БРТ" пришло время сказать теплые слова и выразить глубокую благодарность всем, кто принимал участие в нем от вашего завода.

В ходе реализации этого проекта представители французской компании "REP" получали эффективную и постоянную поддержку с вашей стороны. Иногда было тяжело, возникали некоторые трудности, спорные моменты, но в результате мы вместе преодолевали все преграды. Все наши люди, которые работали на Балаковорезинотехнике, увезли из России огромные воспоминания, полученные за время их пребывания на балаковской земле, а также в процессе общения с работниками вашего завода.

Очень трудно сказать слова благодарности каждому. И я хотел бы назвать персонально всех тех людей, но боюсь пропустить хотя бы одного. Благодарю технический отдел, отдел технологической оснастки, персонал по ремонту. Благодарю переводчиков, ...ванию вместе с нами часы в цехе, спасибо за ...ную работу, а также за ...ных визитов нашего партнерства. Мы будем рады помогать и поддерживать ОАО "Балаковорезинотехника" тем или иным способом. Смело обращайтесь к нам в любое время.

Мы закрыли этот проект в конце 2011 года. Пусть наступивший 2012 год принесет всем вам радость, счастье, здоровье и хорошую жизнь!

От лица всей команды Jean-Louis Picard, Sales Manager "REP International"

НОВЫХ ПЛАНОВ И СВЕРШЕНИЙ!

Уважаемые работники ОАО "Балаковорезинотехника"!

Трудовой коллектив ОАО "Балаковорезинотехника", известный своими славными традициями, производственными успехами, новыми достижениями, вносит вклад в развитие химической промышленности и в целом Саратовской области.

Пусть наступивший 2012-ый год порадует вас новыми событиями и реализованными проектами, исполнит все начинания, потому что успех каждого из вас - залог процветания ваших семей, завода и родного края.

Желаю вам здоровья, счастья и отличного настроения!

Д.П. Нечаев,
...едатель обкома Росхимпрофсоюза

Let's stay in Russia if you don't mind, more precisely in Tatarstan, where you supplied several mold lots to an OEM of the automobile industry. Can you tell us more about?

M.W. Indeed, REP sold multi-station CMS presses to this customer who was looking for a solution capable of shortening his cycle time, reducing flashes and the scrap rate and limiting part finishing operations after molding (trimming, stripping time, etc.).

After having made a prototype mold for approval of the possible part quality and shipment of samples to the customer, three mold lots have been defined. Then the consecutive steps followed, from drafting the mold drawings of the first mold lot to their manufacturing and final testing after customer approval, from the mold testing to the production of samples up to the commissioning in the customer plant.

Thanks to the REP design of the tooling, the parts are finished when exiting the molding process (no finishing operation required) with very light marks on the inserts and excellent tightness, thus eliminating flashes on the parts.

Depending on the parts, the cure time could be reduced from 24' (time usually required on a DESMA rotary machine on the customer site) to 9-10' on the CMS press.

Before

Challenge won for both REP and the customer!

The cure time has been reduced by more than half and all additional operations at the mold exit (part trimming, forced stripping, disassembly of the molding part,...) have been eliminated while considerably reducing the scrap rate.

"The cure time has been reduced by more than half and all additional operations at the mold exit have been eliminated ..."

Are the high-tech solutions offered by REP always easy to implement for the users?

M.W. The technicians of the customer were trained in the use/operation of the presses at REP during 2 weeks with hands on training, failure simulation, etc...

At the end of this training phase, the customer is able to produce on his new machine. However, REP will always be available to answer any additional questions in the future.
This is part of our consulting job.

After

Molded parts produced on the machines with the 4-cavity and 8-cavity molds supplied by REP

The Steps of a Project:

1 Production study to define the number and type of machines required

2 Study of the best economic solution for optimized productivity and reduced part finishing operations (automatic part stripping, trimming, waste, ...)

3 Drafting the mold drawings

4 Customer approval

5 Mold making

6 Mold testing and part sample shipment to the customer for approval

7 After approval, shipment of the mold

8 Commissioning of the whole press and molds in the customer plant

REP TRAINING: VISA FOR THE FUTURE

Training at the Heart of Customer Service

Always about offering its customers the most comprehensive possible service, the REP group offers a comprehensive range of training sessions. Considering that a poorly or badly trained customer will be less satisfied of his machine or will have to call the after-sales service more often, REP encourages its customers to have their personnel trained.

Every year, more than 300 people are trained in REP's facilities or on the production sites of the customers!

Every year, more than 300 people are trained throughout the world in REP's facilities or on the production sites of the customers using well-defined programs and suitable pedagogical supports.

The training sessions are held either directly in the customer's plant or in the French head office of REP in Corbas, a few minutes away from Lyons, an opportunity for certain customers to discover Europe or France and to combine business with pleasure. Lyons is the 2nd economic hub of France and the global capital of gastronomy.

Theoretical training in the class room and hands on training in the workshop, held in the customer language

REP's customers benefit so far from a technically detailed training, which is held in their language in an overall friendly and nice ambience in small groups. The training sessions of REP held by specialized facilitators take into account all machine generations and configurations by alternating theoretical training in the class room and hands on training in the workshop with machines equipped with various options and different mold types. Each trainee is handed over a training support document.

The press operation and maintenance training sessions

They are conducted by the After-sales Department and address to operators, maintenance technicians and adjusters.

Scheduled over 2 days, the target of the training OPERATING A G9 PRESS consists in given the trainees an overall view of the possibilities of the machine, make them familiar with the control and programming of the machine and study together their particular production and application situations.

The training MAINTENANCE OF THE G9 PRESSES scheduled for 3 days focuses on initiating the trainees in the prompt maintenance and servicing of the machine by providing the required information.

Performance Optimization Workshops

They are conducted by the Process Development team and address to the machine set-up engineers, mold set-up operators, mold designers, mold design draughtsmen, rubber injection plant methods managers.

Learn how to design a mold and to optimize the injection process

These training sessions of a duration of 20 hours (2 and a half days) shall train the customer in designing a mold by considering all features required for its dependable operation (Training Process and Mold Design), in better understanding the injection process and in optimizing the process (Training Adjustment of the molding parameters).

Regular training sessions are organized in French, English, German and Spanish in Corbas all over the year; the dates can be found online on the website of REP www.repinjection.com

Content of the Training Session OPERATING A G9 PRESS

- Overview of the injection process
- Functional and technical overview of the press
- Man Machine Interface
- Starting a production
- Introduction to the safety devices
- Settings, production and production stop (hands on)
- How to use the optional equipment
- Fault interpretation

Content of the Training Session MAINTENANCE OF G9 PRESSES

- Detailed study of the machine,
- Using the diagnosis help tools (electrical diagram, control monitor, ...)
- Overview and use/operation of the press
- Hydraulics, electrics, measurement chains, process-control system, troubleshooting (hands on)
- PC (hard- and software), documentation

Content of the Training Session MOLD DESIGN

- The molded part and the corresponding specs.
- The compound, its characteristics, and its assessment
- The rubber injection press
- The steels for rubber molds
- Design approach
- Thermal points on process and mold
- Construction elements
- Mold structure
- Part feeding
- Air pulling (vacuum)
- Thermal regulation principle
- Technical definition
- Valve-gated CRB
- Injection-compression mold
- Injection-transfer mold
- Mechanization in molds

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