



Clextusion

Summary

International
Development
Clextal, Inc. Organisation

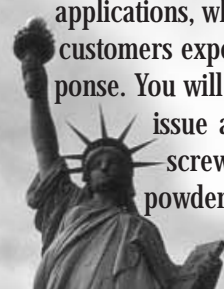
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In Brief



Twenty years ago, Clextal started a revolution in North America, when we opened our first U.S. office and introduced our expertise in food twin screw extrusion technology to this continent. Since that time, the hard-working men and women of our American operations have succeeded in making twin screw extrusion a realistic alternative to traditional processing for a diverse range of applications. Key to our success has been our focus on helping our customers apply extrusion technology to create high quality, market-driven products. Along the way, our company has evolved to adapt to changing market dynamics. Today, Clextal Incorporated is again taking a leadership role in developing new applications, while maintaining our firm commitment to our core values : to exceed our customers expectations, in equipment, service, process support, flexibility and response. You will find evidence of the success of our strategy as you read in this issue about a novel customer-driven application : special twin screw extruders dedicated to the processing of explosive powders. Also, in continuity with the previous issues, you'll also discover the new extruder model Evolum HT 88, installed and operational at our customers' plants.



Benoît Delaval
President - Clextal, Inc.

Number 5
JUNE 2000



CLEXTAL
FRAMATOME



Clextal, Inc.
Tampa, FLORIDA



International Development

Clextral, Incorporated. **Organization**



Ideally located in Tampa between North and Latin America, Clextral Incorporated has been serving customers for over 20 years. This subsidiary of Clextral S.A. was structured to offer all of the services available at our French headquarters in a more convenient location for our customers in the Americas. Our team is an international melting pot with employees fluent in English, Spanish, Portuguese, French, German and even Russian.

Our comprehensive facility offers a full menu of services to assist our customers in their extrusion success.

Service

Our team of experienced service agents are ready to assist our customers to provide a quick resolution of their service needs. Our services include machinery installation, start-up, staff training, trouble-shooting, maintenance assistance and repair.

We stock an inventory of spare parts in Tampa available for quick shipment.

Process and Pilot Plant

Two twin screw extruders and peripheral equipment are available for product testing requirements (pre-conditioner, mixer, dryer, pumps, cutters and conveyors.)

Staffed by our team of engineers and food scientists.

Engineering

Our engineering services include :

Design of extrusion processing lines

Procurement of ancillary equipment

Line control software design

Engineering of parts for local manufacture

Sales

Our experienced sales engineers are always willing to review your product ideas and production goals and recommend equipment suited for your project. Our support staff assist in providing efficient response to your equipment requests.

In addition to our U.S. staff, our sales agents provide



local representation in Mexico, Venezuela, Colombia, Chile, Argentina, Peru and Brazil.

Name and address of agents :

Argentine : SOFRAR

Brazil : KORIMA

Chile : BEHNKE

Colombia : HANSEATICA

Mexico : IMPULSORA INT. De MAQUINARIA

Peru : MAURY REPRESENT INDUST

Venezuela : IMAQSU



D

Development & Process

...where new product ideas become reality

Clextal, Inc.-Pilot plant and Process

Interview of Henri FOURNAND - General manager and vice President of Clextal Inc.

Maribel Badel : Why operate a pilot plant in Tampa?

Henri Fournand : *Our pilot plant in the U.S. reflects our commitment to the American markets and our goal to be fully capable of offering our customers in the Americas the best service at all times.*

Indeed a pilot plant of this size represents an important investment, but it is indispensable. First, our facility demonstrates equipment and ability to prospective customers - considering that almost all Clextal users are confidential. Second, it provides a convenient U.S. location for companies who desire work in product development or to test new product ideas. Our test plant staff is comprised of an experienced team of engineers and food scientists.

Are there special issues to deal with in the American markets?

There are several particular aspects.

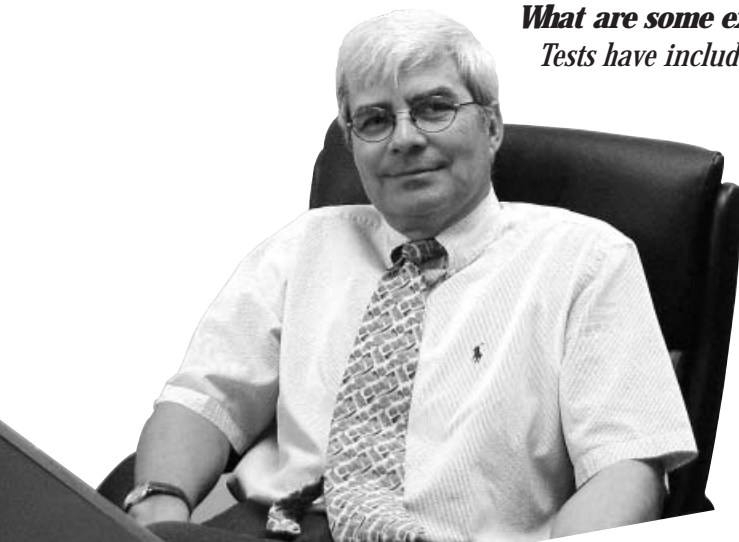
First, we are often challenged with new ideas brought by our customers. Much of the work we do is not for traditional products but for completely new products or applications.

Second, when we deal with mature applications, we are often pushing technical or scientific limits. This makes the job very challenging technically and scientifically.

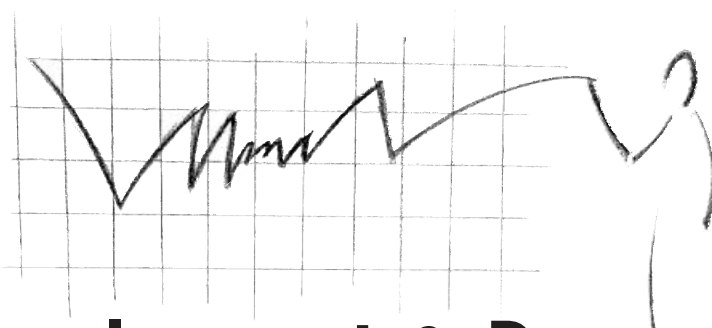
Third, all test plant R&D is covered by two-way confidentiality agreements, which makes it impossible for us to promote many of our accomplishments, but this is part of the agreement. This close relationship when we are sharing confidential information makes us part of a strong customer-supplier team. In fact, Alliance Agreements we have with several customers include the use of our pilot plant equipment and staff as part of our relationship.

What are some examples of testing that «pushes the envelope?»

Tests have included running 48 hours non-stop, or a process at 85% moisture.



D Development & Process



...where new

How do you manage this variety of techniques?

We run three kinds of tests, with each type requiring a different level of scientific and technical support.

- *Demonstrations - to illustrate our competency to prospective customers*
- *Feasibility tests - conducted to test the ability of the equipment and process to attain product and/or production goals*
- *Development - allowing a manufacturer to engage our pilot plant and staff to perform tests to achieve specific goals, whether product development or purely research related. This may require the outsourcing of additional ancillary equipment.*

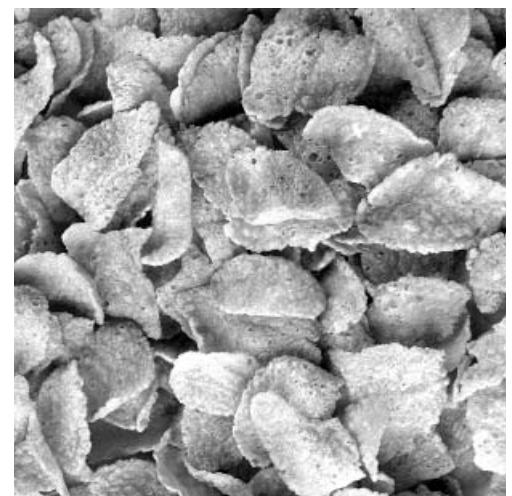
What is new for tomorrow?

Clextral Inc is strongly involved in the promotion of the Evolum twin-screw extruders that bring tremendous advantages to food, petfood and plastics applications. The next big thing in Tampa will be the installation of an Evolum HT53 in our pilot plant.

Clextral Inc. Technical Research Facility and Pilot Plant - where new product ideas become reality!



expanded snacks



corn flakes

product ideas become reality

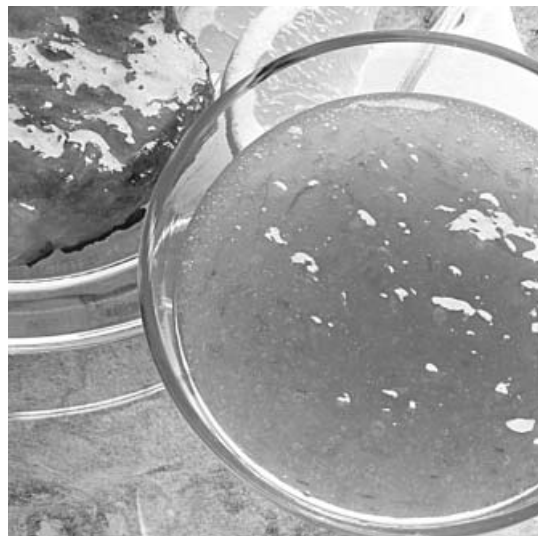
The Clextral Inc. facility is the only research center in the U.S. dedicated exclusively to twin screw extrusion research and product development. At our test plant, we specialize in creating new profit opportunities for our customers. A look at some of the projects tackled by our R&D staff over the past year illustrates the benefits of our strength in cross-functional technology. An overview of some of our challenges :

- Creating biodegradable packaging
- Developing pre-gel flours with specific functional characteristics
- Protein fibrillation from animal and/or vegetable sources
- Creating a new palette of flavors through various processing techniques
- Reacting pharmaceutical bases under strictest production parameters
- Modification of pulp for paper manufacture
- Development of value-added pet food and treats
- Starch modification for industrial uses
- Processing breadcrumbs with distinctive characteristics
- Developing functional ingredients
- Oil extraction

When our experts search for processing solutions, they draw from a wealth of knowledge in extrusion technology for food, plastic, chemicals and paper. It's this insight and vision that generates new profit opportunities for our customers and helps us achieve their product goals.



protein fibrillation



gelification ingredients



oil extraction



Service & Maintenance

Clextal Services :

The Service Department is the heart of Clextal Inc., providing technical assistance to our customers in North and South America. Our representatives offer support in many ways; via telephone, fax and e-mail; on site technical help; maintenance and training; product development assistance and spare parts sales. Technical support is available in every language commonly spoken in the Americas, English, Spanish, Portuguese and French.

Clextal Inc. service is the western link in our worldwide service organization, with two additional locations in France and Singapore. This global network gives our customers a service department that is open for business nearly 24 hours per day. All Clextal service engineers carry cellular telephones so they are always available if an urgent need arises.



Michael Rhinehart is Clextal, Inc. Service Manager. We met with him to get more insight into Clextal, Inc. Service activities.

Marcel BADEL : *Could you describe the types of "on-site services" Clextal Inc. offers?*

Michael RHINEHART : *We offer on-site services in three areas. First is our Maintenance Supervision Inspection Program, which is designed to keep our customers' equipment operating at highest efficiency and prevent unplanned down time. In this program, a Service Engineer conducts a*

complete inspection of the Clextal extruder and Clextal auxiliaries to check safeties, look for any worn or broken parts, find unusual wear patterns of extrusion parts and check maintenance logs.

Following this inspection, a report is prepared detailing the condition of the extruder and describing any maintenance that should be scheduled. If desired, the service engineer can remain on site to assist in the maintenance efforts. Over the past two years, we have seen a growing demand of this kind of support as our customers implement more and more preventive maintenance programs. Our program fits this strategy perfectly.

Naturally, we complete Extruder Commissionings - Installation and start-up of new and relocated extruders. This service ensures that the extruder and auxiliaries are properly installed and in optimum working order from the first day of operation.

Last, but very important is our Emergency On-Site Service - Immediate response is critical to minimize lost production time and to ensure that repairs are made safely and correctly. Clextal service engineers can be on site at a customer's location within hours of the report of a problem.



interview of Michael Rhinehart

Do you offer any kind of training for the Clextral users?

We provide several areas of staff training - Process Technology, Maintenance and Repair courses are offered on-site and at our pilot plant. Individual courses are offered for extruder operators and maintenance personnel and a combined program is offered for personnel who are responsible for both operation and maintenance. The courses are very practical and customized to each customer's process. We are receiving more and more requests for staff training courses. Plant managers need to depend on their internal resources and consequently request their staff to be as knowledgeable and efficient as possible in their field.

How do you manage spare parts

The Service Department maintains our extensive spare parts inventory and our top priority is to ship orders the same day that they are received. We review our inventory regularly to ensure that sufficient quantities of commonly used parts are maintained. We also ship parts from stock at Clextral S.A. in France to guarantee the fastest response to parts requests. In addition to the sales of new spare parts, Clextral Inc. offers the service of refurbishing used Clextral screws and barrels at our manufacturing facility in France. The refurbished parts carry the same warranty as new parts and allow our customers to maintain their extruders with high quality OEM parts at a reduced cost.



trilobal liner



Clextral Inc. servicing
american customers

R Realizations



Impact



Airbag production : An innovative technical solution adapted to a demanding product.

In the face of statistics - half a million people killed and 5 million seriously injured on the roads throughout the world - the science of accidentology is encouraging the automobile industry to improve cars.

While in all cases the safety belt remains the basis of all restraint systems, combining it with the safety airbag significantly reduces the risk of death and serious injury in the event of accident (from 65% and 75% in the case of frontal collision for example). Passive security is involved in the prevention of the accident itself.

Clextal has been working for 20 years with the **SNPE Group**, a leader in the development of nitrocellulose-based propellants used in airbags. Its division, SNPE Propulsion, has fully taken part in the success of flight 503 of Ariane 5 which confirmed the quality of conception and realization of motors driven by solid propellants.

SNPE Propulsion also designs and supplies energy feedstocks (propellants) used as a source of gas to inflate auto airbags for its partner Autoliv, a world leader in car safety equipment.

In Europe, Autoliv estimates that approximately 90% of new vehicles leaving the assembly line are fitted with a driver's airbag, and 70% with a passenger airbag. The installation of lateral airbags started in 1997. In Japan where development of the airbag started later, market penetration rates are at present nearly as high as in Europe. Throughout the rest of the world, the rate

varies considerably from one country to another, but the average can be rated at less than 30% for driver and passenger airbags.

Last winter Clextal installed a 5th machine at SNPE SA, at Saint-Médard en Jalles (France).

This machine (model BC72) will manufacture the pyrotechnic products directly used in the gas generators for airbags. This is a polymer base associated with energy compounds. The result of a close collaboration between teams at SNPE Propulsion and Clextal, this machine was subject to very strict specifications, requiring several thousand man-hours for the mechanical, electrical and automatic control studies. The numerous technical meetings facilitated innovative technical solutions through the overall validation of the project.

It is not difficult to imagine the sophistication and safety levels required for the production of pyrotechnic material.

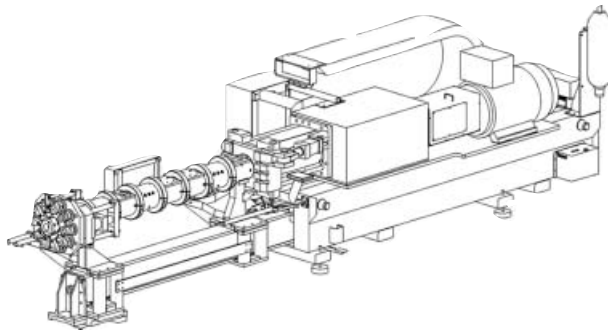
The particularities of the product caused Clextal to adapt the technology of the machine.

The BC72 is fitted with an ultra-fast opening system of the sliding sheath specially studied for the decontainment. Design of the sheathes is also special - adapted to the type and to the risk of the materials to be used.

The machine is installed in a strong room and activated by automatic control systems operated remotely by operators who are in complete safety in another room. The numerous sensors designed for instantaneous response times mean immediate decontainment throughout the process.

The continuous process is very reliable. It enables work on a reduced quantity of material (3 to 5 Kg) for a capacity of 100 to 200 kg/h, 24 hours a day.

safe...



This set-up demonstrates the ability of Clextral to establish genuine partnerships with its customers, the ability of its teams to respond to the most rigorous requirements and to offer technical solutions far beyond the standard design of its equipment.

Start-up of the BC72 took place throughout the first 8 weeks of 2000.

At the present time, SNPE Propulsion is completing the first performance tests on the installations with an "inert" product.

Very high safety will be enforced for the first energizing components produced starting in June 2000. The sets produced could ensure their mission of passive security in our vehicles from that time forward.



T

echnology



EVOLUM : The collection is expanding

The first Evolum HT 88, the third EVOLUM model after the HT 53 and the LT 145, left the Clextral factory at Firminy at the beginning of April.

The Evolum HT 88 (diameter of screw : 88 mm) offers the main features of the Evolum HT 53 which we have already shown in previous number of Clextrusion :

The modular conception of the screw/barrel unit, maximized cooling circuit of barrel modules improving performance of thermal control, new machine design which facilitates maintenance and cleaning, simplified wiring, and operator-control screen mounted on the extruder chassis.

As on all the Evolum extruders, there are a maximum of 6 speed levels, to allow each user to choose the configuration most appropriate to the process or to the manufacture that he wishes to set up on the machine. Likewise, two frame configurations are available :

-the H frame, which provides a hydraulic opening of the barrel unit

-a fixed frame with access to the screw through the front of the machine.

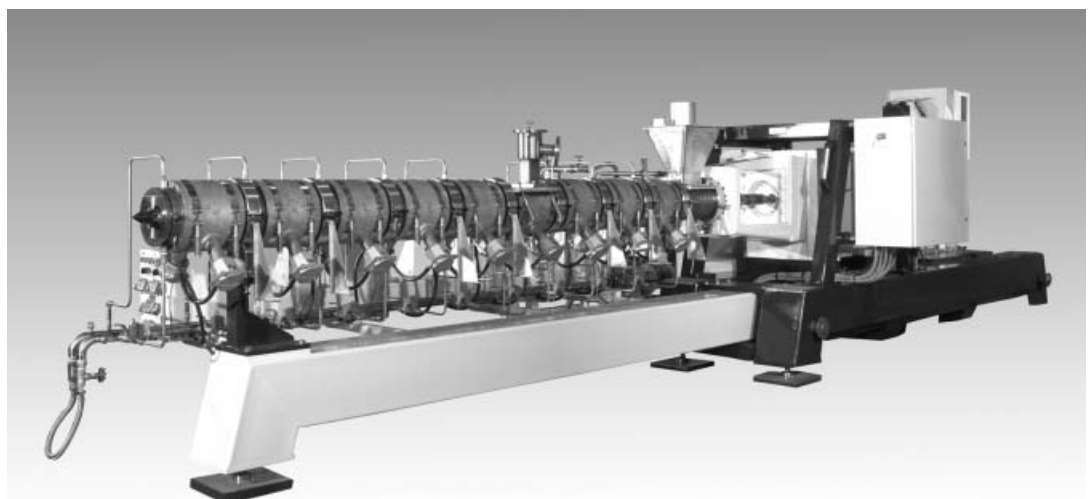
The Evolum HT 88 is of the HT type, i.e. "high torque".

Clextral High Torque machines provide torque which (depending on the maximum speed required) can reach a level twice the equivalent model in the BC range (the BC 72 in this case). The HT 88 can operate at a maximum pressure of 275 bar.

| motor power (kW) | maximum screw speed (rpm) | torque available (N.m per shaft) |
|---------------------|---------------------------------|-------------------------------------|
| 195 | 200 | 4664 |
| 391 | 400 | 4664 |
| 586 | 600 | 4664 |
| 683 | 800 | 4078 |
| 854 | 1000 | 4078 |
| 1025 | 1200 | 4078 |

Our engineering teams have already started to work on the two following models : the EVOLUM HT 32 and the EVOLUM HT 68 which we will introduce in the next issue of Clextrusion.

EVOLUM HT 88





clxsales@clextral.com-clextralUS@aol.com-e.allibe@pacific.net.sg-clx-

You've got mail...

In the last CLEXTRUSION issue, we introduced our new Web site :

<http://www.clextral-framatome.com>

We have taken another step to streamline your communication with our company.

You can now reach correspondents directly and personally through e-mail.

To make it simple all addresses for Clextral SA (France) and Clextral Asia Pacific (Singapore) are accessed the same way :

Initial of the first name followed immediatly by the last name (without any space, dot nor dash), then "**@clextral.com**"

For instance, you can e-mail our Clextral Services Manager, Georges Hallary, at the following address :

ghallary@clextral.com

We have also created some generic addresses, in case you don't know to whom you need to address your messages :

Sales : **clxsales@clextral.com**

Clextral Services : **clxservices@clextral.com**

Technical (engineering & process): **clxtech@clextral.com**

Marketing : **clxmkg@clextral.com**

Procurement : **clxachats@clextral.com**

Clextral,Inc.(Tampa USA) has been using e-mail for some time already with a different access provider. The generic address is :

clextralus@aol.com

Now we can correspond and exchange documents quickly and efficiently 24 hours a day, around the world.

e-mail

clxsales@clextral.com-clextralUS@aol.com-e.allibe@pacific.net.sg-clxsalesclxsales@

net



In Brief...

Pedro Rivera is joining the sales team as responsible of Latin America.

FISPAL Brazil from 13 to 16 June

IFT Dallas, TEXAS from 11 to 14 June

AACC Kansas City, MISSOURI November

IPA Paris Villepinte from 20 to 24 November

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