



**This new issue of Clextrusion illustrates the actions that CLEXTRAL has been carrying out**

**for almost fifty years in the fields of health and the environment.**

Whether it is in the Energy sector with sophisticated DKM transfer and pumping systems, the Paper Industry with major reductions in consumption levels of water and chemical reagents, the Food Industry with energy-efficient production processes, or the Chemicals and Plastics Industry, the CLEXTRAL Group contributes to increased individual well-being while preserving natural resources.

The group plays an active part in nutritional balance with worldwide distribution of ready-to-eat cereals, provides new processes to make complex animal and plant proteins available, designs cost-effective units for manufacturing pasta and couscous, while making full use of its expertise in drying, and designs machines to develop new, healthier foods based on local raw materials.

One of the solutions developed to increase the quantities of proteins produced on our planet is the sustainable development of aquaculture, with farms on land and at sea : CLEXTRAL

initiated work in this domain 30 years ago, and has become a world leader in production of foodstuffs for aquatic animals. Pet foods also make up a fast-growing market, and CLEXTRAL twin-screw systems provide solutions to ensure the health and longevity of our pets.

Cooking, drying and packaging are fields of expertise that contribute to good conservation of raw materials and foodstuffs.

CLEXTRAL systems create new biodegradable materials from renewable raw materials, and treat polymers in a single phase, thus replacing several separate, discontinuous operations.

This long-term strategy provides tangible results : the many new avenues currently under development show promising signs of industrial growth. This driving role for the CLEXTRAL Group is the result of constant innovation in the field of Research and Development, dynamic partnerships with our customers, and our ability to provide expertise and a full range of services by supplying units on a turnkey basis.

**Welcome to the CLEXTRAL Group forum**



Alain BRISSET  
CLEXTRAL Group  
Marketing Manager

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# AFREM'S "DRYING EXPERTISE"

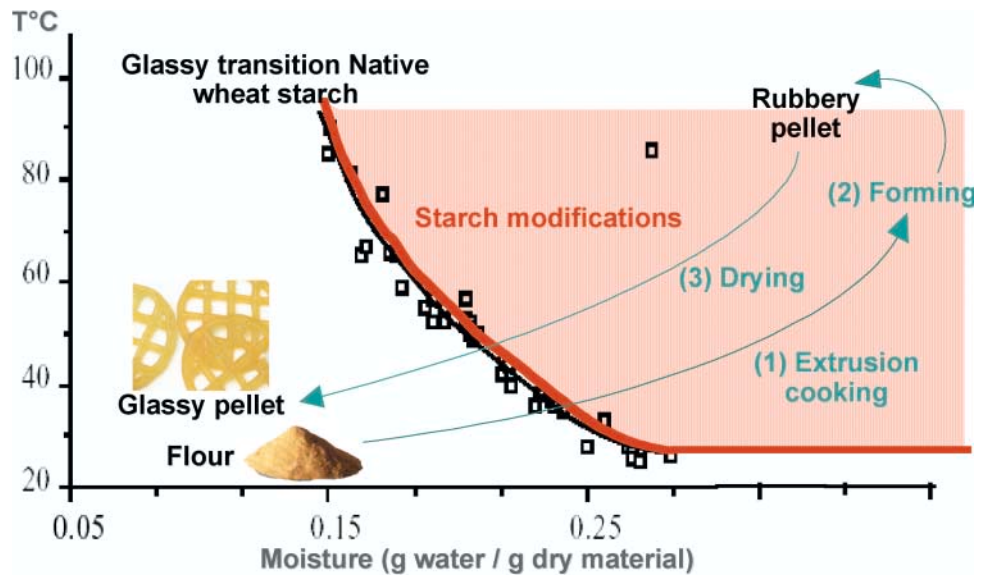
## DRYING, A SUBTLE PROCESS

The drying operation is a transformation that is found in many industrial sectors : food processing, paper making, pharmaceutical processing, chemical manufacturing, etc.

Drying occurs when a product is heated sufficiently to cause evaporation of the liquid components (water or other solvents), without affecting **the functional properties of the raw materials**, while conserving the results of **prior processes** applied and ensuring compliance with the **quality criteria for the finished product**. Attention and adherence to these criteria make this transformation such a subtle one.

The liquid extraction process enables us to :

- lengthen product life,
- give products specific final textural and structural properties,
- reduce transport costs,
- facilitate subsequent handling and transformations.



Glass transition in native wheat starch in relation with pellets drying process.

(Source : Zeleznak, K. J. and Hosenev, R. C. 1987.

Glass transition in starch. Cereal Chem. 64(2) : 121-124

## EACH PRODUCT HAS A UNIQUE PROCESS

The drying techniques utilized depend on the shape or the physical state of the products to be dried : whether they are in liquid, solid, powder or pasty form. Water loss kinetics for a liquid product are simple, because the drying speed is constant. The situation is very different for solid products, in which water may be present in 3 forms : **free, absorbed and combined**.

- **free water is easily removed** from a solid
- **absorbed** water may be removed by **applying a certain quantity of energy**
- whereas it is **impossible to remove water that is chemically combined** without modifying the intrinsic structure of the solid

## UNDERSTANDING, DESIGNING, MANUFACTURING : AFREM'S SKILLS

To design a dryer that suits your individual requirements, we take a wide range of data into account :

- **choice of the drying technology** that best suits the product, by examining the criteria of quality, cost efficiency and preservation of the environment.
- **industrial sizing** : this integrates the heat balances, the mass and heat transfer laws, the shape, size and density of the product, the production output rate and control of the water content at the input and output.
- **acquisition of the product characteristics** : heat sensitivity and drying speed.



Céline BOSSU  
AFREM  
Process Manager

# TECHNOLOGY

As drying mechanisms are not entirely predictable, it is necessary to go through a small-scale experimental phase to determine the water loss kinetics.

**Experimentation is a key stage in the development of new products : utilizing standard platforms, the equipment is specifically adapted to suit your requirements. In this approach, AFREM accompanies you in the task of designing and developing your products and processes.**

AFREM has pilot systems available that simulate various types of heat treatment. These tests can be carried out to :

- validate technological feasibility
- determine industrial sizing
- identify the "product - process" critical points
- transfer experimental layouts into industrial environments
- ensure process control before transfer to the production site.

The CLEXTRAL Group has a multi-purpose pilot plant at its disposal, which integrates AFREM dryers :

**batch dryer :** the AFREM drying oven. This pilot unit can be used to simulate several drying technologies :

- static drying on fixed frames and rods
- dynamic drying in a drum

**continuous dryer :** the CDS (Compact Drying System). As its name suggests, it is a compact drying line, with integrated steam kits, that includes a vibrating skin dryer, a twin-cage rotary dryer and a cooler.



Heat chamber

Overview of the CDS



## AFREM : YOUR DRYING PARTNER

AFREM equipment, expertly designed to suit specific user requirements, is supplied on a turnkey basis. Our offer includes production expertise, superior product quality and network of partners, making AFREM an ideal choice for your drying requirements.

Are you interested in developing new products, or optimizing your processes ?

**Call AFREM,  
the drying professionals.**

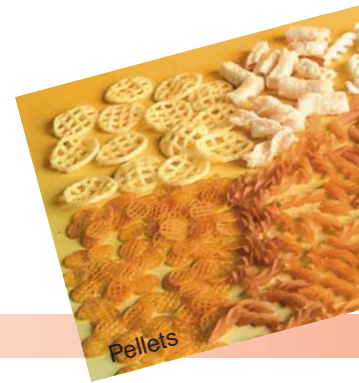


**CLEXTRAL**  
Group

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# PILOT PLANTS : WORKING IN CLEXTRAL'S FACILITIES TO INNOVATE AND INVENT TOMORROW'S PRODUCTS



**Creativity, dynamics, partnerships :**  
key assets to ensure progress  
for our customers.

## TOMORROW'S PRODUCTS

**Two pilot plants**  
at our customers' service



BC 72 TAMPA  
Pilot Plant  
CLEXTRAL Inc.

CLEXTRAL operates two test centres, one in France and the other in the USA ; they are indispensable tools for the development and creation of new products.

A global approach works best when consideration is given to one customer at a time. CLEXTRAL remains close to our customers in all aspects of service, particularly in process support. For this reason, both pilot plants work on a shared platform, the Evolum® 53 twin screw extruder. This enables our international customers to test an idea and conduct development work in one region, then transfer that expertise to a local production facility on another continent while minimizing logistical concerns such



Twin-screw Evolum® 53 extruder

as transport and import of raw materials.

Of course, equipment constitutes a major parameter because it ensures maximum efficiency in development work, and for this reason CLEXTRAL maintains an aggressive investment policy for its pilot plant facilities. Our fully-equipped centres offer a total of nine twin-screw extruders together with dryers, mixers, a flaker, etc., and a large number of auxiliary elements. This equipment may be used to carry out work on complete units for CLEXTRAL's different fields of activity : extrusion of food products, plastics, paper pulp, pasta, couscous, etc.

However, the keystone of the organization is the multidisciplinary team of engineers and technicians with diverse training and experience, who bring together scientific disciplines and practical knowledge. CLEXTRAL's teams regularly travel around the world, visiting our partners' sites, implementing new concepts and learning about production issues in our customer's and partners' factories. The end purpose of their creative work remains firmly oriented towards industrialization.



Flaker

## Test Centre Utilization

The CLEXTRAL test stations are multipurpose : they are utilized for the firm's research and development work and its sales and marketing efforts.

## Internal test centres

CLEXTRAL'S internal test centres are dedicated to technological advancements. Before new equipment designs are brought to the market, the prototypes undergo strict test programmes to check their functionalities and their robustness, in conformity with ISO 9001 quality standards. For example this has been the case in recent years for Evolum® extruders, and also for the new compact dryer (CDS : Compact Drying System) for pellets and pasta, which is currently installed in the european test centre.

It is also in CLEXTRAL's test centres in Firminy and Tampa that tomorrow's products are pro-actively created, whether they take the form of improvements to existing product families, such as new shapes or textures for breakfast cereals ; integration of functional ingredients ; or more advanced developments like the recent work on protein fibrillation units (HMEC : High Moisture Extrusion Cooking).

Over the decades, the growth and development of CLEXTRAL has been marked by innovation and technological advances, including :

- ▶ multiple colouring systems that enable different shapes and colours to be produced simultaneously,



Expanded cereals

Bicoloration

- ▶ bicoloration - a patented system - used to make dual-coloured and dual-textured products,
- ▶ transformation processes for fibres from cotton and other annual plants, using extrusion to make paper.

Every year, the CLEXTRAL group applies for many patents linked to equipment, processes, and finished products.

## PLATFORM FOR CUSTOMER TESTS

Whether in Tampa or in Firminy, many customers from all over the world visit CLEXTRAL each week to :

- ▶ attend demonstrations concerning processes or technology,
- ▶ participate to one-week training modules that are designed for operators, maintenance staff, and process managers. Each module is customized depending on the specific demand, and conducted by an experienced engineer to ensure complete understanding of the CLEXTRAL extruder,
- ▶ take part in a seminar dedicated to a specific industry.

Every day, our customers' ideas are tested on our extrusion units. Each test is rigorously documented by one of our experts, in accordance with ISO 9001 standards. The test file is the central record that enables full preparation of the tests, and it also covers the aspects

of confidentiality and intellectual property.

## CUSTOMER PARTNERSHIPS

Moving beyond these classic approaches, CLEXTRAL regularly initiates closer partnerships with customers ; which take many forms.

Joint R&D programmes are true joint development ventures, which respect the expertise and contributions of each partner (especially as far as intellectual property and confidentiality are concerned). These programmes form a basis for win-win relationships in which both parties work together with a clearly defined common goal, mixing their teams to ensure maximum levels of efficiency.

Some programmes use dedicated technology platforms set up in France or in the USA to provide our partners with faster access to our test centres, with additional peripheral equipment already on site, and the option to store raw materials and finished products as well. Our partners have complete access to technical experts who are fully conversant in their technologies, ensuring a truly productive relationship.

Test production runs are performed to meet orders from our customers, enabling them to validate their marketing hypotheses at full scale, without investing in a production unit immediately, or contacting a co-packer, with the resulting obligation of revealing specific know how and divulgate some intellectual property.

CLEXTRAL is actively participating in the development of new products and services to support our customers around the world, through investments in personnel (technicians, engineers, doctors) and technology (new machine designs and improvements). 5 to 7 % of annual income is invested in research and development.

The firm's success may be measured in the growing number of new



Gilles MALLER  
CLEXTRAL  
Director Extrusion  
Processes and Lines

# DEVELOPMENT AND PROCESS

applications and partnerships established worldwide in Clextral's industrial sectors : the Food Industry, Chemical Processing and in the Paper Industry where environmental and health concerns are driving legislation and consumer demand.



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# TO KNOW A LOT ABOUT SUGAR



**Sugar (or saccharose for the chemists), a symbol of pleasure and well-being, has a tumultuous, fascinating history : the product, which was formerly an object of envy, linked to adventure and great explorations, is now consumed throughout the world at a rate of over 128 million tonnes per year !**

## SOME HISTORY...

Sugar cane was certainly grown in New Guinea 3,000 years ago ; it was transported to India, and then on to China. The name comes from the Sanskrit word "Sarkara", which gave the words : sucre, Zucker, sugar, zucchero, azucar, etc. It was not until 15 centuries later, i.e. in about 500 B.C., that the Persians (Iran) grew sugar cane to extract "this honey without bees". Just two hundred years later, the exotic plant was being grown throughout the Mediterranean basin, thanks to the Arab conquerors. The crusades helped to spread it to the countries of Northern Europe.

Explorers and traders from Italy, Spain and especially Portugal, followed by the English and the French, carried sugar cane with them to grow it in Brazil and the West Indies.

Sugar beet was not grown until the 19<sup>th</sup> century.

In Europe, we eat about 35 kg of sugar per person each year, either directly, or indirectly (about 3/4 of the total) included in manufactured food and foodservice products.

The chemical and pharmaceutical industries only use a small fraction of the overall quantities.

Certain countries such as Australia, Cuba, Israel, etc., show record levels of consumption, with amounts of over 55 kg per person each year, and as high as 67 kg per person each year in Singapore.

## PRODUCTS AND THE COOKING/EXTRUSION PROCESS

To find pleasant ways to satisfy his taste buds, mankind has invented vast quantities of products based on sugar. The traditional manufacturing technology usually involves several successive phases, which are usually :

- **mixing** : sugar + additives (polymers, functional ingredients) + water,
- **cooking** during which the crystals disappear ; a smooth, homogenous, mixture is produced, tastes and aromas are developed, and the water content is reduced through controlled evaporation,

- **cooling**, that stabilizes the product, gives it a certain viscosity, and makes it suitable for subsequent treatment : shaping, pouring, cutting, etc.

Twin-screw cooking and extrusion was invented by CLEXTAL in the 1970s for applications in the Food Industry : the phases outlined above are exactly the same functions as those provided by a twin-screw machine : it was thus quite logical for CLEXTAL to take an interest in these processes. A patent was taken out in 1973 under the number 73 46887, with the theme : manufacturing process for decrystallized sugar.

This innovative technology has since been used to improve existing processes and create new products.

## APPLICATIONS

There are many applications in confectionery that use the twin-screw technology including the following examples :

- continuous conching of chocolate,
- production of cooked amorphous sugar,
- chewing gum and continuous production of gum base,
- hard and soft liquorice,
- almond paste and marzipan,
- jellied sweets,
- caramel and caramelized milk ("dulce de leche")
- jelly fruit

Thanks to its exceptional characteristics, the CLEXTAL co-rotating twin-screw machine is able to process all these widely differing products, continuously, as it



combines several basic functions such as : mixing, heating/cooking, degassing, cooling, and shaping.

**The generic process is as follows :**

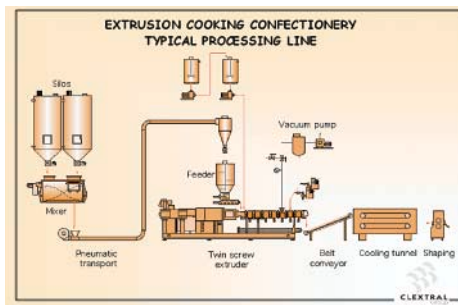
The crystallized sugar is dosed in the feeder section of the machine, with one or more ingredients such as : starch, wheat flour, glucose syrup, fat, molasses, fruit concentrate, etc. : a mixture is produced inside the machine with initial external heating and shearing provided by the screw.

In the following section, the mixture is cooked, stirred, sheared, and homogenized, and transformed into a paste : this is the plasticization section.

Next, the mixture may be allowed to degaze, and/or receive other solid ingredients. As the product is transported, its temperature is controlled : other functional ingredients are injected, such as flavours, fluidizers, or gelling agents, for example, and the product is mixed continuously to obtain a homogenous product.

Once it has reached a certain viscosity, the product is compressed and then extruded through a shaped die. Some products are solid enough to be cut directly as they exit the machine, while others require a waiting period after extrusion before they can be poured into moulds or put onto cooling belts, and then given their final shape.

- a screw length/diameter (L/D) ratio of between 25 and 48,
- high heating and cooling capacities,
- a machine able to operate at low or high speeds, with sufficient spare motor torque and capacity to absorb high pressure levels,
- mastery of metallurgy for the screws and barrels, to ensure compatibility with the products transformed and the mechanical forces involved,
- a design that enables easy control, maintenance and cleaning.



**The main advantages of this technology are as follows :**

- a continuous process that replaces several discontinuous operations : the startup, shutdown, control and automation phases are optimized. This facilitates traceability considerably.
- a compact technology that conserves floor space, and reduced production costs concerning maintenance, power, staff, and investment. Often, when the product exits the extruder, it has reached its final moisture level of conservation ; this eliminates drying phases that can last several hours (or days),
- a guarantee of constant quality under highly favourable conditions of hygiene,
- all types of materials may be processed because the twin-screw machine does not have any limitations in terms of viscosity, an immediate, advantageous capacity for innovation,

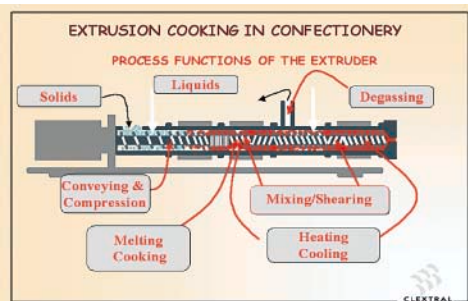
**DEVELOPMENT AND PROCESS**



Alain BRISSET  
CLEXTRAL Group  
Marketing Manager

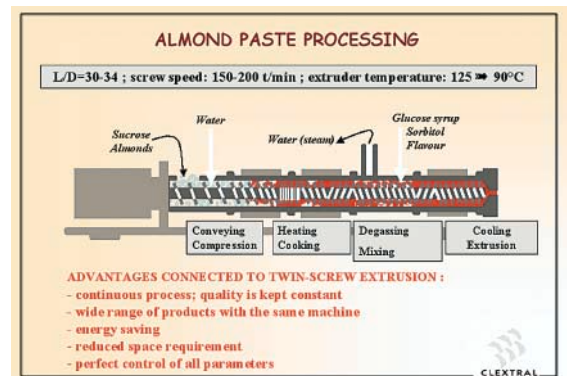
and an infinite variety of recipes,

- flexibility of use that makes it easy to switch from one product to another.



To meet these generic requirements, CLEXTRAL provides the following elements with its extrusion systems :

- thorough knowledge of the processes and full mastery of complete lines,
- expertise concerning the composition of the screws (made up of different elements)



Production of almond paste



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# PULP FROM COTTON LINTERS : PROCESS WHICH CANNOT BE MISSED

CLESTRAL provides simple, optimized, cost-effective solutions for producing paper pulp from annual plants. Converting cotton linters into paper pulp is one of many processes developed by CLESTRAL that create opportunities for cotton-producing regions and for countries manufacturing high-quality paper and specialty papers.

## Cotton linters :

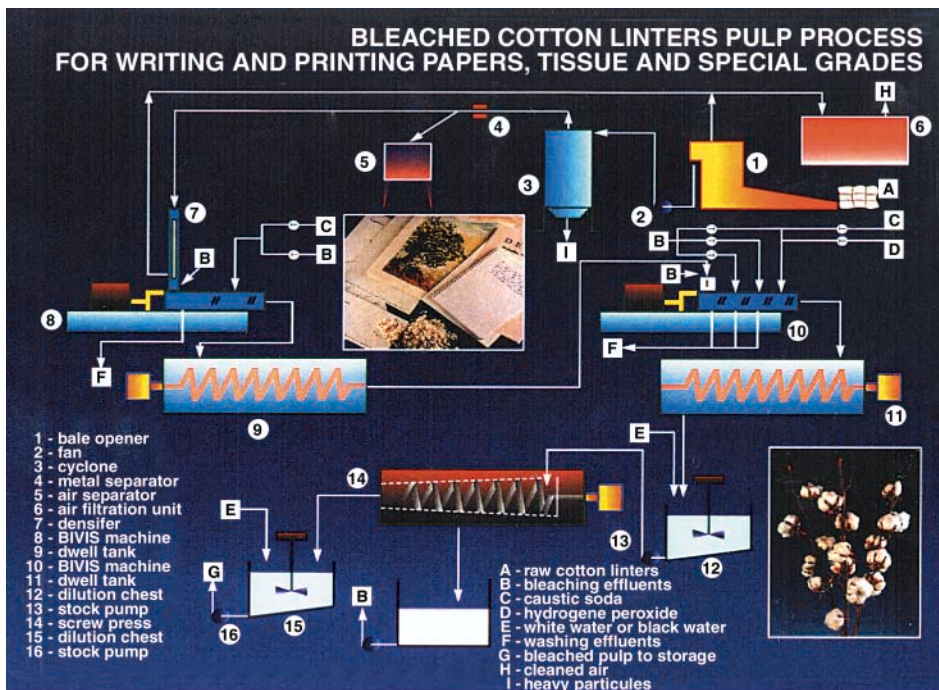
Cotton linters are agricultural residues from cotton crops that represent a highly advantageous source of cellulose for making quality paper.

These raw materials, whose quality can vary widely depending on their geographical origin and the harvesting techniques used locally, may be processed to obtain paper pulp and then paper whose final quality and applications are very different.

## A patented, continuous process :

linters of poor quality, which may contain over 30 % miscellaneous waste.

- ▶ a process ensuring a high level and constant pulp quality with less labor,
- ▶ a pulp quality that enables the production of writing and printing paper conforming to the highest international standards,
- ▶ reduced quantities of chemical reagents ; the savings on reagents can reach 20 to 30 %,
- ▶ a bleaching process that preserves the quality of the environment by using only hydrogen peroxide as a bleaching agent, and provides pulp that has been bleached without chlorinated agents, i.e. TCF pulp,
- ▶ a manufacturing process that is well suited for use in countries with limited water resources, as the process requires only small amount of water ; water savings can be as high as 90 % as compared with traditional processes,
- ▶ major savings of electrical and thermal energy representing up to 30 % of the total energy requirements, because the process does not use steam, unlike traditional processes,
- ▶ substantial savings on civil engineering due to compact size of the equipment
- ▶ equipment designed for easy maintenance.



## Significant advantages :

The twin-screw process offers important benefits for our customers :

- ▶ the ability to process cotton linters of widely varying quality, particularly cotton



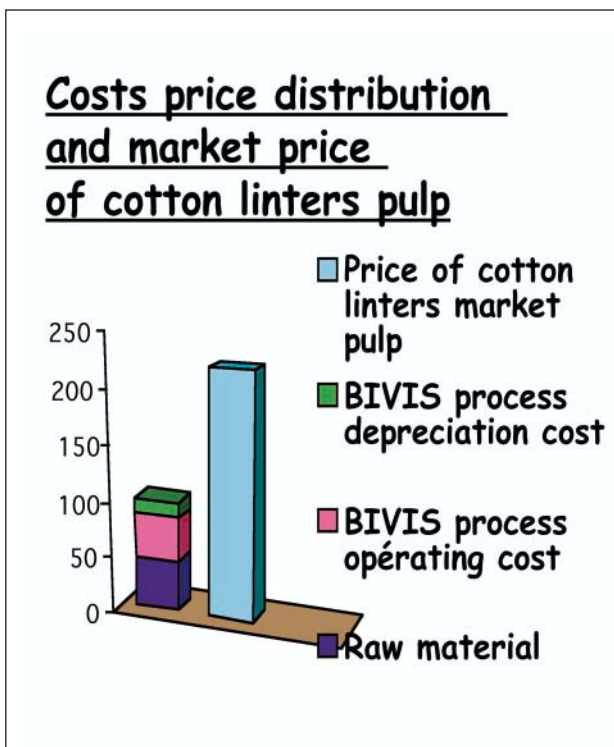


Philippe COMBETTE  
CLEXTRAL  
Cellulose Pulp and Paper  
Department Manager

## DEVELOPMENT AND PROCESS

### An economical process :

The table below shows the cost efficiency of pulp production using cotton linters pulping process developed by CLEXTRAL.



### Considerable experience :

The CLEXTRAL process to convert cotton fibres into pulp, based on the TWIN-SCREW machine, has been in continuous use for over 15 years. Units that manufacture pulp from cotton fibres, including cotton linters, are currently in operation to the satisfaction of our customers in many countries, including France, Great Britain, Russia, China, Zimbabwe and more recently, Uzbekistan. Operation of these production units proved that the process is

especially well suited for small to medium levels of capacity, i.e. between 2,000 and 20,000 tonnes per year. Furthermore, our experience now enables us to provide simplified equipment and production units that generate enormous savings in overall investments and operating costs.

### A more competitive process :

Thanks to extensive field experience and collaboration with customers, CLEXTRAL has completed studies that resulted in simpler, more economical twin-screw machines. The new twin-screw machine is called the EVOLUM 240 PAP. Moreover, the work to ensure simplification has been extended to

cover the whole pulp manufacturing process. Today, we can provide equipment and production units at prices that are 20 to 25 % lower than the previous models.

CLEXTRAL has also concentrated on reducing operating costs more specifically the maintenance costs of the twin-screw machines. Changes have been made in the geometry of the wear parts, together with new metallurgical solutions that are less costly and ensure longer service life, reducing maintenance costs by over 40 %.

### Many applications for paper pulp made with cotton linters :

Among the many applications are specialty papers with high added value, such as security paper, drawing paper and filter paper. Another market is high-quality printing and writing paper that is manufactured to meet the local requirements of the cotton producing countries. Concerning this application, the value added to local raw materials represents substantial currency savings for these countries, as most import pulp or paper for domestic consumption.



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# DKM, CLETRAL'S DOSING AND TRANSFER PUMP DIVISION IS WELL-KNOWN FOR ITS EXPERTISE IN THE FIELD OF ENERGY



François DURIEUX  
DKM  
Technical Director



DKM is especially active in the treatment of fossilized energy, petroleum, usually at the wellhead level.

When crude oil comes out of the ground, it is very often a mixture of gas and liquid, sometimes with added water (seawater in offshore wells), so it cannot flow directly through pipelines thousands of kilometres long to reach the user countries and their refineries. Gas-liquid separation and chemical treatment units are located on the spot or nearby.

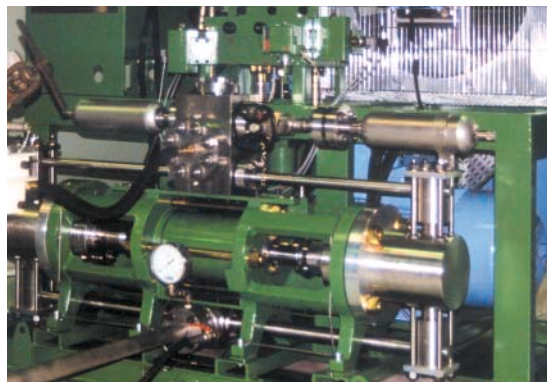
By definition, for a well to be efficient, the petroleum must emerge under pressure. At first, the pressure is created naturally, by the weight of the Earth's strata above the oil-bearing layer. As the petroleum is removed, the pressure falls and artificial methods are used to increase it. One common method involves re-injecting gas under pressure alongside the well pipe in the Gas Lift system. When the oil reaches ground level, naturally, there is a pressure drop, and just as in a refrigerator, there is a risk of frosting on the valves and piping on the "Christmas tree". This is where

DKM's expertise and equipment is essential.

DKM systems inject small quantities of methanol under high pressure (equal to that of the well) to prevent frosting, either in the Gas Lift system, or at the level of the wellhead. The output levels are a few dozen litres per hour, at 150 to 450 bars. DKM pumps may also inject other products at the level of the well including anti-foaming agents, bactericides and corrosion inhibitors (because the pipelines are made of carbon steel.)

DKM also supplies circulation pumps for hot glycol to dry the gas, if it is not re-injected into the oil-bearing rock.

In certain cases, DKM pumps are used to inject emulsions that free the crude oil from the porous rock and thus ensure the recovery of the full contents of the oil fields.



Far from the wells, and much closer to us in artificial underground gas storage sites, DKM pumps inject methanol to prevent frosting when large quantities of gas are taken out during the winter. They are utilized to dose a powerful odorant, tetrahy-

drothiophene, into natural gas, increasing safety by enabling the detection of leaks. Finally, petroleum companies utilize DKM pumps to dose various additives into fuels leaving their refineries before being sold to the general public.

There are almost 2,000 DKM pumps in service in the main petroleum producing areas, mainly in the Russian Federation, Iran, and Qatar, and around the Gulf of Guinea : Congo, Nigeria, and Angola.

In the field of nuclear energy, DKM supplies a specific type of pump, used in each PWR type nuclear power station in France and in other countries: South Africa, Korea, and China.

This multi-purpose pump is used to test the primary circuits (seals, valve operation, etc.), to fill the accumulators, and as an emergency backup to lubricate the primary pump seals, in the event of a total power failure in the power station.

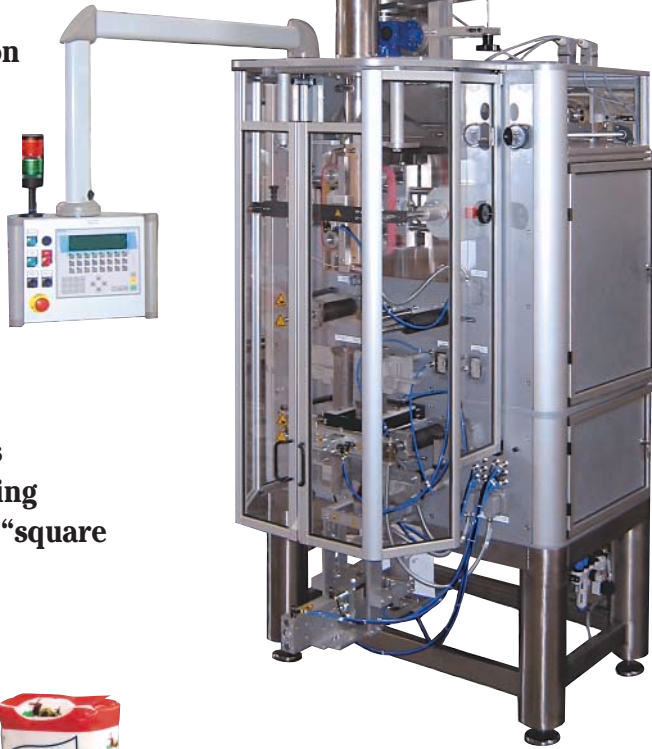
55 pumps of this type, qualified to operate during and after a severe earthquake, have been delivered for 900 MW, 1,300 MW and 1,400 MW power stations.

DKM technology is also used in the chemical refining processes for spent nuclear fuel.

Its expertise and its full mastery of the processes involved enable DKM to provide innovative, reliable solutions in sectors of extreme technical complexity.

## NEW FROM LYMAC

It has become a tradition for LYMAC : one innovation replaces another. Following the success of the COMBI-PACK (see Clextusion N°11) comes the debut of the compact TFC-220 vertical bagger, which can form various bag dimensions, including the shape known as the “square top and bottom” shape.



### What is a square top and bottom bag ?

It is a bag whose square base is self-supporting. The head is given the same shape with a weld that is folded down and bonded.



This geometry makes the bags easy to handle and store, and enables attractive shelf presentation.

### Technology

Two machines are usually required to make this kind of bag : first, a “standard” bagger, and then a carousel to finish the folding and bonding operations on the upper section.

Yet the LYMAC TFC-220 bagger can complete all the operations, in one machine, functioning in a cascade sequence.

First, the machine makes the bag with a square bottom and a gusset top. After filling, the bag is

lowered under its own weight through the vibrating side flap to the lower station. The lower station closes the top folds and carries out the welding and cutting operations. The bag travels to the final station which folds the top weld over and bonds it to the bag, completing the operation.

This technology is well suited for packing products that flow easily, such as rice, sugar, chickpeas, or lentils, at a rate of about 35/40 bags per minute during industrial production.

### Advantages:

the TFC-220 system provides considerable advantages :

- just one machine instead of two
- simple, robust, reliable mechanical elements

## RÉALIZATIONS



Joël MAISONNIAL  
LYMAC  
Director

- a compact bagger, able to make cushion, gusset, and pyramid type bags, together with square top and bottom bags
- a twin tube version may be supplied (70 to 80 bags per minute)
- quick installation and removal of the square top and bottom option
- a competitive price.

Lymac, a supplier of complete packaging machines and units, **your partner.**



## SEASON'S GREETINGS



**Georges JOBARD**  
CLEXTRAL Group  
President of the Board

CLEXTRAL teams wish you a happy, healthy and successful New Year. In 2005 we will continue to work closely with you to ensure the success of your projects from start to finish, and provide continued support of your operation worldwide.

## IN BRIEF

You can meet the CLEXTRAL Group teams during a number of shows in 2005 :

- **Cereals Mixed Feed** : 8 - 11 February 2005 - Moscow - RUSSIA
- **Tecnoalimentaria** : 18 - 22 February 2005 - Barcelona - SPAIN
- **MEB** : 23 - 26 February 2005 - Cairo - EGYPT
- **SIHGAZ** : 24 - 28 February 2005 - Hassi Messaoud - ALGERIA
- **Snaxpo 2005** : 12 - 15 March - Hollywood (FL) - USA - Booth number 419
- **Easyfairs emballage** : 16 - 17 March 2005 - Lyon - FRANCE
- **Djazagro** : 21 - 24 March 2005 - Algiers - ALGERIA
- **International Fair of Tripoli** : 1 - 9 April 2005 - Tripoli - LIBYA
- **Interpack** : 21 - 27 April 2005 - Düsseldorf - GERMANY
- **Iran Agrofood** : 29 May - 1 June 2005 Tehran - IRAN
- **Foire Internationale d'Alger** : 1 - 9 June 2005 - Algiers - ALGERIA
- **Fispal** : 7 - 9 June 2005 - Sao Paolo - BRAZIL
- **Snackex** : 20 - 21 June 2005 - Berlin - GERMANY
- **ProPakasia 2005** : 22 - 25 June 2005 - Bangkok - THAILAND
- **IFT 2005** : 17 - 20 July - New Orleans - USA - Booth number 2158

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