

INNOVATION IN MATURE INDUSTRIES: The Case of Brasilata S.A Metallic Packaging

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1. INTRODUCTION

This paper presents an analysis of the innovative initiatives of Brasilata S/A Metallic Packaging (*Brasilata S/A Embalagens Metálicas*), a steel can manufacturer, with entirely Brazilian capital and amongst the 3 largest companies in its sector. Initially, we will present the characteristics of the steel can industry in Brazil, emphasizing the aspects related to production, acquisition and incorporation of new technologies. As you will see, this industry depends on technologies developed by its suppliers in order to be updated. Afterwards, we will analyze the business model of Brasilata and its innovation policy. It does not have a structured P&D unit, such as industries that require expanded knowledge; even so, it presents a very high innovation rhythm, being, in this aspect, ahead of its sector in national as well as in international terms. This innovator behavior will be exemplified with some recent innovations by Brasilata, among them, Closure Plus, a new concept that radically modified the way paint cans are closed. Such an innovation required the participation of research institutions and intense relationships with materials suppliers, clients and employees in different sectors of the company, among others. At last, the results of the implementation of this innovation will be presented, as well as the alternative plans Brasilata has to negotiate with foreign companies interested in licensing a patent. The central idea in this paper is that the innovations introduced by this company are the result of a continuous learning process, provided by a participatory management style, that has produced a creative environment and favors people development, regardless of the activities they perform or the levels they are in.

2. THE STEEL CANS INDUSTRY

The steel cans industry is a mature industry whose development dates back from the beginning of the nineteenth century. Due to the fact that cans had their origin 200 years ago and became popular still in the nineteenth century, they have gone into an intensive improvement process through the years. Today, steel cans have to compete with packages made with other materials such as plastic, aluminum, etc., in order to have its share in the packaging market. It is, therefore, a mature industry that could now be in a decadent phase of its life cycle, if it were not for the recent appreciation of steel cans for environmental reasons. Steel is completely recyclable and decays naturally, since when in contact with air it becomes iron oxide, a substance that does not harm the environment. In the case of Brazil, its appreciation is also due to the fact that its raw material is a hundred percent national and it is produced of an abundant resource, not having to be imported. This contributed to improve our trade balance, a fact that becomes more and more important for Brazil's monetary stabilization. The raising of oil price is another factor that should improve the position of steel in relation to plastic, which can be easily substituted.

2.1. The Steel Can Market in Brazil

In 1998, the Brazilian packaging industry presented the following numbers: 5.5 million in tons and value equivalent to US\$ 10 billion, representing 1.8% of our GDP. The participation of the steel packaging sub-sector during this same period of time (cans, sprays, pails and barrels) was 10.5% of the Brazilian market (Datamark, 1999). Following a world trend, we can see in Brazil that steel cans have also been losing market share to packages obtained from other materials, as shown in Table 1. Some occurrences in the last decade enable us to clearly see this decline. In 1989, Brazil started producing two-piece aluminum cans for beverages. The effect of this over three-piece steel cans was devastating: in only two years they were completely substituted by aluminum cans. Only in 1997 did the production of two-piece steel cans begin in the Northeast Region of Brazil, which enabled steel to re-conquer a small share (less than 10%) of the Brazilian market of beverage cans.

Table 1: Brazilian Packaging Market – Average Annual Growth in % (1991-1998)

Material	Growth (%)	Material	Growth (%)
PET	53.4	Steel	5.6
Aluminum	43.6	Glass	4.4
Flexible	15.5	Market Average	8.1

Source: Datamark, 1.999.

Steel cans of up to 25 liters, presented in the form of cans, sprays and pails are used to hold a great variety of products - edible oil and processed foods being its largest market, followed by chemical products, mainly paints, varnishes, glues and solvents. In Brazil there are about 50 companies that produce steel cans, some of them too small and regional. Among these there are, today, very few integrated companies; the largest one is Nestlé, manufacturing its own cans. About 10 companies are medium or large and the leader – Cia. Metalúrgica Prada, has around 15% of the total market share, when measuring the consumption of sheet metal. The 10 largest companies together account for 75% of the market share. Table 2 shows the main companies by type of packaging, the majority of these are medium size and all of them with Brazilian capital. This large number of companies is due to low entry barriers for newcomers and high exit barriers for existing manufacturers. The entry barriers are basically restricted to the availability of financial resources to install a new production unit.

Even with no entry barriers, it is not very likely that there will be newcomers in this industry due to demand conditions, since these do not look promising in the long run due to the high degree of substitution in the last decades. On the other hand, exit barriers contribute to the large number mentioned above and to the growing competition among them. Exit barriers in this industry are basically a result of the characteristics of its assets, such as special equipment that prevent the adoption of a diversification strategy to enter other markets. The combination of these factors enables forecasting of a merger and acquisition process; however, maintaining a large number of small companies acting regionally. Regional action is a predictable phenomenon, since cans, as a rigid form of packaging, have high enough transportation costs to protect small manufacturers located in distant regions. On the other hand, the alternative of leading companies keeping only assembling units near their markets is restricted by the extremely large variety of shapes and lithographed labels.

Table 2.: STEEL CANS SECTOR: MAIN COMPANIES AND TYPES OF PACKAGES

TYPE OF PACKAGE	COMPANIES (in 1998)
AEROSOLS	Brasilata e Prada
PAILS	Brasilata, Prada Real e Rimet
CANS	Anhanguera, Aro, Brasilata, Cervi, Embrasa, Femepe, Iguaçú, Latal, Matarazzo, Mecesa, Módulo Mococa, Novalata, Olivebra, Palmira, Paulista, Prada, Real, Renner, Rimet, Rio Industrial, Renda, Rojek, Santa Ritense, São Miguel, Steelatas e Trevisan.
TWO-PIECE CANS FOR BEVERAGES	Metalic
TOPS/LIDS AND CORKS	Amorim Pinto, Aro, Mecesa, Matarazzo, Rojek, Silva Pedroza, Renda, Silva Portela, Tapon Corona.

Source: summarized and updated by the authors of Datamark, 1999 edition (page 67).

The clients are packaging companies that use packages not only to protect their products, but also to promote them, therefore the great variety of shapes, sizes, colors, etc. According to Hine (1995, pages 106-135), especially after supermarkets developed in the U.S. in the thirties, packaging has become part not only of advertising, but of the product itself. Thus, there are always new packages in the market due to the fact that new products are constantly being introduced and also because packages of known products are modified for the sake of better functionality or esthetical reasons. We do not see, among companies that make use of steel cans, the tendency to manufacture internally the packages they need, mainly because of diverticalization processes based on the concept of core competence. In addition to that, advances in process technology, mainly in lithography, require frequent updates, which make vertical integration unfeasible.

Nevertheless, clients exert a strong pressure for lower prices, which, due to this industry's characteristics can be translated into smaller margins and, as a consequence, in reduced funds for the

performance of technological development activities. Studies conducted by Torquato and Silva (2000), in respect to flexible packaging industries, showed that clients - usually large companies in the food industry, present high bargaining power, due to these factors: large number of packaging manufacturers and large installed capacity - the majority of these with a family organization, all of them fighting for their market share in a complex and dynamic environment (pages 77-78). This is the scenario in the steel can industry.

3. TECHNOLOGY

Technology does not represent a barrier to the entrance of newcomers, for this is an industry that uses technology developed by the capital goods and raw material industry. The manufacturing of metal cans involves a series of operations, mainly cutting and cold forming of metals. Steel cans usually have three or more pieces: bottom, body, top and eventually a ring where the top fits. Its manufacturing process encompasses three phases: lithography, stamping and assembling. In lithography, the labels are printed directly over the metal sheets, which has excellent graphical results. In stamping, the bottoms, tops/lids and rings are manufactured in high-speed presses, and are usually referred to as components. In the assembly lines, using the lithographed sheets and components, the cans are assembled. The body of the cans with three or more pieces is closed with a side seam that can be welded electrically or cemented with thermoplastic. The components (bottoms, tops/lids or rings) are seamed onto the body. The most widely used material for the manufacturing of steel cans is tinplate, a thin steel sheet (0.15 to 0.30 mm thick) coated with tin, to avoid corrosion. In some cases alternatively is used tin free steel (TFS), which is coated with metallic chromium instead of tin, which should be varnished before being used.

Regarding the supply of tinned sheet iron, the basic raw material, this industry relies solely on Cia Siderúrgica Nacional (CSN), the only manufacturer of these metal sheets in Brazil. CSN has competitive prices in the international market and exports about 30% of its production. This percentage exceeds the internal market demand, according to Machline and Álvares (1999, pages 2-3). Up to the present time, there has not been any disagreement in the sector with CSN, partly due to the need of cooperation with steel can manufacturers in face of the threats that were the result of the intense substitution of materials in the packaging industry. It is precisely in the food sector, which is one of today's main markets in the can industry, where the major competition with other materials such as plastic, *tetra brick*, aluminum or glass, in some products that traditionally use steel cans such as edible oil, tomato sauces and powdered milk. Although CSN is conscious of the need to preserve the domestic market, it is a fact that after its privatization, which took place in the early nineties, can manufacturers were literally left in their hands. That is, whenever interests diverge, the frailness of can manufacturers will become apparent.

The steel can industry can be considered a supplier-dominated industry, according to the typology developed by Pavitt (1984) and updated by Bell and Pavitt (1993, pages 178-9). According to these authors, this industry is usually made up of small and medium size companies that present weak P&D and engineering capacity. Manufacturers of machines, equipment and other productive materials always develop technical changes that take place in this type of industry. Its technological course is defined by cost reduction and opportunities to accumulate technological knowledge are focused on the improvements and changes in production methods and, only occasionally on the product project. The largest part of the technology is incorporated into capital goods and other productive materials. That is to say, companies that belong to sectors that are dominated by suppliers can contribute very little to the innovations they are most in need of. Other characteristics in this industry are shown in Table 3, extracted from the above mentioned authors.

When analyzing the role of learning in the process of technological growth in developing countries, Bell (1984; page. 191) distinguishes the following types of learning categories, according to the way the improvement has been obtained: (1) through production activities that are taking place in the company (learning by operating); (2) through the introduction of technical changes in the existing productive process, through trouble-shooting type of activities (learning by changing); (3) through training (learning by training); (4) through hiring professionals that already have the knowledge the company is in need of (learning by hiring) and (5) through research activities using technological information resources (learning by searching). Taking these learning categories into consideration, steel can manufacturers obtain their technological improvements basically through learning by doing, that is, through the first three above mentioned types. Hiring of professionals is also a resource for technological development; nevertheless, they are usually related to replacement of staff for operational activities

within the company. In this sector, learning through systematic research and development activities is practically unknown. As shown below, Brasilata does not follow this general rule and exceeds the limitations imposed by the characteristics of its industry, through a business model based on the participation of all its employees.

Table 3: BASIC CHARACTERISTICS OF THE SUPPLIER DOMINATED SECTOR

TYPICAL CORE SECTOR	Agriculture, Housing, Private Services, Traditional Manufacturing
COMPANY SIZE	Small
TYPE OF USER	Price sensitive
MAIN FOCUS OF TECHNOLOGICAL ACTIVITIES	Cost reduction
MAIN SOURCES OF TECHNOLOGICAL ACCUMULATION	Suppliers, Production learning, Advisory services
MAIN DIRECTION OF TECHNOLOGICAL ACCUMULATION	Process technology & related equipment (Upstream)
MAIN CHANNELS OF IMITATION AND TECHNOLOGICAL TRANSFER	Purchase of equipment & related equipment
MAIN METHODS OF PROTECTION AGAINST IMITATION	Non-technical (Marketing, trade-marks)
MAIN STRATEGIC MANAGEMENT TASK	Use technology generated elsewhere to reinforce other competitive advantage

Source: BELL, Martin & PAVITT, Keith, 1.993 (pages 180-1).

4. BRASILATA

As we have previously mentioned, Brasilata is a company with entirely Brazilian capital and amongst the third largest companies in its sector. Its gross revenue was R\$ 91 million in 1998 and R\$ 115 in 1999. The company was founded in São Paulo, in 1955, as a tinplate iron lids manufacturer for cosmetics packaging - Indústria e Comércio de Estamparia Brasung Ltda. Three years later it became an incorporated company and started manufacturing cans for biscuits and electrodes. In 1963, the group that now controls it bought it. In 1965, Brasilata purchased Estampbrás and incorporated the lithography department, thus expanding its activities with the manufacturing of cans for paint and chemical products. In this same year it finally changed its name to Brasilata. In the seventies, Brasilata purchased Metalúrgica Brasilina SA, a traditional can manufacturer in São Paulo. Geographical diversification begins in the early eighties, with the acquisition of Killing Reichert SA Metalgráfica in the city of Estrela, Rio Grande do Sul. With this, Brasilata added cylindrical and conical pails to its line of products. In 1992, its third unit is established in the city of Rio Verde, Goiás, in order to meet the demand for edible oil packaging due to the growing production of soybeans and its industrialization in the Central West Region of Brazil. With the acquisition of the assets of Crown Cork Embalagens, in 1.999, Brasilata starts manufacturing sprays for the Estrela unit, which was enlarged to serve our Mercosul partners. Brasilata finally consolidated itself in the Brazilian market as a manufacturer of complex steel packaging, namely packaging that has more than three pieces (components), usually: top/lid, ring, body and bottom.

Since 1985, Brasilata has adopted a participatory business model on all levels, starting with strategic planning. In 1991 it introduced employee results participation (almost four years before approved by legislation). Even faced with crises, such as the one in the beginning of this decade, Brasilata has always made an effort not to dismiss people. Brasilata believes in teamwork and really puts it into practice. All its employees are seen as inventors and new suggestions are always welcome. This is done through a formal program called 'Simplification Project' (*Projeto Simplificação*), which started in 1987 and a large part of the staff has participated since. As an example, in 1999, out of 890 presented ideas, 436 were approved and 44 received prizes. Recognition of the authors of these ideas is done in the three Simplification Project prize award events that take place every year. In addition, there is a great annual event called *Supercopa*, when the best ideas of all three units are evaluated. The awards usually go to teams formed by five or more people, including the inventor, mechanic, electrician, machine operators, etc. The cash is distributed among all Brasilata employees, as established in its results participation system that came into effect in 1991 (almost four years before approved by legislation), as we can see in

Álvares, 1999. In March 2000, all of Brasilata's employees received a share that represented an average of 1.1 of their monthly salaries, representing 14% net profit, after the deduction of income tax.

Brasilata has done what administrative literature defines as total quality movement, through the following steps: (1) established 'Just-in-Time' and quality programs based on small groups, in a way similar to quality circles; (2) established participatory management, employee results participation and client loyalty programs. Brasilata has never taken advantage of exceptional market conditions in order to improve its profit share; and (3) it has created programs to keep its staff permanently updated, allocating space and resources for training within the company as well as outside the company for all its employees. Faced by the nineties crisis, Brasilata put into practice a participative reengineering, an innovative attitude when taking into account that in its theoretical formulation as well as in practice, reengineering is a top down process and, as such, requires a great deal of authority. As stated previously, even in the face of crisis, Brasilata is concerned with its employees, always making an effort not to dismiss people. The values that guide its actions are clearly defined and widespread. Most important among these is its long-term compromise with shareholders, employees, clients, suppliers and the community. That is to say Brasilata adopts a model of social responsibility based on the idea that the company's vision, mission and objectives should take into account the needs and expectations of their stakeholders, based on an integrated, non-hierarchical model.

Brasilata does not have a D&R center or unit like industries with an intensive or technological D&R basis; therefore, it has shown a high innovative rhythm, not only by making minor innovations or improving products and processes, but also making major innovations such as the 'Closure Plus' (*Fechamento Plus*), which will be shown below. Its technological area is the shop floor and everyone is allowed to participate somehow through the 'Simplification Project'. New inventions are developed in this environment where, in a permanent brainstorming, people exercise their creativity and feel confident to contribute. Experience has shown that the company is also concerned with them. As Chanlat (1992) says: 'interest in the institution, which can be characterized in individuals by loyalty, creation of bonds, participation and well done work, cannot develop if the institution itself does not take interest in the person' (page 72). Quoting this author, Brasilata practices group ethics based on the interest in others and the community it serves.

5. CLOSURE PLUS

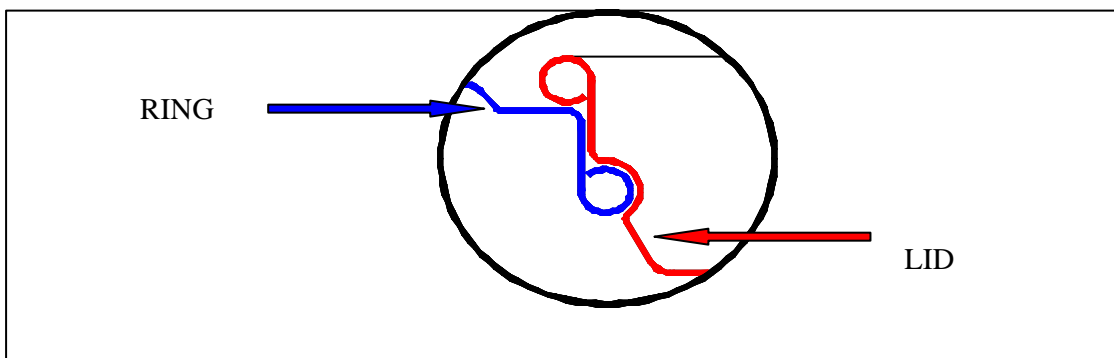
Closure Plus introduced a new concept of lids for paint steel cans, which is completely different from the concept in effect in the beginning of this century. It is not an improvement of the existing closures, but an innovation that introduces a completely different solution in relation to the traditional closure; namely closure by mechanical locking that will probably be the standard solution from now on. The benefits of this are: (1) About three times more resistant than closure by friction, both in relation to internal pressure as well as to shocks and falling, approved through tests by the *Centro de Tecnologia de Embalagem (CETEA/ITAL)* 'Packaging Technology Center'; (2) it's easier to open and close and at the same time it makes violation more difficult; (3) it clearly identifies the first opening of the can; (4) saves material, depending on the diameter of the can, between 19 and 25%, in the set ring-top, compared to the conventional system. There are so many advantages that only in the American market, the adoption of this system will result in over US\$ 10 million in savings, according to a conservative estimate. For this reason, we can call it a real Columbus egg. Nevertheless, this 'egg', for its increased complexity, required very different processes and involved practically the entire company, suppliers, clients, research and fomentation institutions, as will be shown below.

The traditional closure of steel cans is based on friction by multiple pressure and had its origin in John Hodgson's invention, which was patented in North America (number 795.126 year of 1905). Since then, quite a few attempts have been made in many countries to modify the closure process, but none was successful. Closure by friction became a worldwide standard for over 90 years. One of the most recent attempts to substitute closure by friction took place in 1990, when the American company Davies Can introduced a process named 'Trim Rim Can', that was then presented to the local press as being the number one innovation regarding paint cans (THE CANMAKER, 1990. Page 37). Davies must have invested US\$ 15 million in new plants and production lines. Nevertheless, this innovation did not work, since consumers couldn't open the cans. In a meeting that took place in October, 1999 in Dallas, Warren Hayford, then CEO of B.WAY Corporation, who had bought what was left of Davies, stated to one of the authors of this paper that 'they were completely ruined by this project'.

In the beginning of the nineties, the sales group of Brasilata, began receiving orders from two of its largest paint clients, Suvnil (BASF) e Coral (ICI), to manufacture packaging that would make falsification of paints more difficult, a practice that was becoming more and more common. Certain individuals or even companies would buy empty, used 18-liter cans, cleaning them carefully, buying new cans of paint, opening them and, by adding water, obtained two or more cans that would then be sold as new. In order to restrain such a practice, Brasilata's Quality Manager thought of changing the ring profile of the 18-liter can introducing a relief that got marked once the top was opened. This relief did not stop eventual tampering, but would make it apparent in the international concept for edible product cans 'tamper evident'. The sales manager thought this solution would meet client demand and it was his the idea to call it 'First Open'. It won the prize 'Embanews' in the Technology category in 1994.

Disturbed by the success of Brasilata, competitors started manufacturing their 'tamper evident' can named 'Latalimpa', that, in addition, solved a problem caused by the sharp edges of the ring. These edges could hurt the painter's hand, besides exposing non-coated steel, causing oxidation overtime and sometimes contaminating the paint. Introduction of the competition's new can made Brasilata's technical group look for a solution that would also solve the problem of the ring edges on the 'First Open' can. In barely 24 hours, an experienced technician presented a proposal that projected the closure in such a way that the external part of the ring would roll out, forming a circumferential rib that eliminates the corner and, at the same time, created a channel on the external border of the lid, enabling the top to fit onto the ring, as shown in in Figure 2

Figure 2.: SKETCH OF CLOSURE PLUS: PROFILE



This idea solved the problem of sharp edges of the ring, greatly improving the way the can was closed and also making a first opening more apparent. The management of Brasilata approved it immediately and in a few days, the toolshop produced the first prototype. The new can was named 'First Open Plus' and, in only 90 days it was already in the market. In 1995, while talking to the CEO of a client company, Brasilata CEO was asked to manufacture a cheaper round paint can. What the client's CEO was questioning was the possibility of developing a single tight top, such as the ones used for powdered milk. It was known that the single tight top did not close efficiently and that was unacceptable for holding paints, as Garcia would state (1986, page 108). Paint required a can with a more sturdy closure than that of powdered milk, due to the weight, external pressures, etc. There was not yet a known solution for this problem. So, a team was put together to study this subject with the best technicians, and that would be the core of a future product development team. We will be talking about this below. A lot of imagination was required in order to apply this solution to the round can. Nevertheless, about three months later, Brasilata presented to the client, the first round cans with a capacity of 900 ml with the new mechanical closure. In order to differentiate it from the square can, it was named only Closure Plus.

The President of Tintas Coral strongly approved this idea and a partnership was established to develop the new closure system. It was then time for hard work, since the original idea had to be changed several times, also to allow the adaptation of the filling lines, which should be compatible with both the 'plus' and the conventional system. The high speed lid production process had to be modified once again. A special equipment had to be projected together with Indústria de Máquinas Moreno, that is, a whole new process technology had to be developed because of this new closing concept. There was, therefore, a process opposite to the typical one in industries that are dependent on suppliers: Brasilata innovated the product to such an extent that it brought about a need to innovate the process itself. During this process,

Brasilata had the support of FINEP, who financed, among other things, the purchasing of materials and the performance of market tests.

5.1. Patenting Strategy

Brasilata's inventions can only be protected by patents due to the possibility of copying by means of reverse engineering. Due to the characteristics of the international market of steel cans, for an effective protection, the following countries were included: United States, Japan, Canada, Mexico, Austria, Spain, France, England, Italy and China. For this, a patenting process was initiated through an international application, as established by the 'Patent Cooperation Treaty' (PCT), taking advantage of the priority deadline of one year, established in article 4 of the Paris Union Convention. On April 28, 1995, an international application was deposited in the International Office of the 'World Intellectual Property Organization' (WIPO/OMPI), claiming priority rights over the invention that resulted in Closure Plus and designating the countries mentioned above. During the patenting phase in the United States, the examiners from US Patent and Trademark Office (USPTO) found documents on patents for closures of steel cans that had construction elements similar to those of Closure Plus. According to examiners, this documents eliminated its absolute novelty characteristic as required by the legislation. Among these documents, examiners highlighted the North American patents of Meacham of 1937 and Cloutier of 1979 as being particularly very close to Brasilata's invention. Because of the USPTO's continued refusals of the patent request, Brasilata filed a request for the continuation of the process in order to better explain the invention and define more clearly its claim. Brasilata's technicians analyzed the patent documents mentioned by the USPTO and noticed that its constructive elements were very different and could not possibly have the same benefits as the Closure Plus. For this reason they had not been implanted. With this, on May 4, 1999, the USPTO finally issued patent number 5.899.352 for Closure Plus. The European patent had already been obtained on November 25, 1998 (EP 0706 468 B1) and the Argentine patent was issued on October 12, 1997 (number 251361).

5.2. Use and Licensing

Brasilata started manufacturing 0.9 and 3.6 liter round paint cans with Closure Plus in 1996, having, since then, manufactured more than 60 million units, saving about 1,000 tons of steel, equivalent to more than R\$ 1 million. In addition to this, Brasilata has already gone into a new era in which royalties regarding the licensing of this and other inventions and models developed by them, will also be part of their revenue. The first licensing contract was signed in March, 2000, with the company Renda do Recife, and includes, besides license for usage, the supply of its own components (lids and 'plus' rings). Today, (June 2000), two companies – a North American and a European company are negotiating the licensing the Closure Plus with Brasilata. In the case of negotiating licenses for the first world economies, another interesting business possibility may come up. Due to the great competitive advantages presented by the local steel industry, Brazilian steel has been severely penalized both by excess taxes and the establishment of quotas, specially in the U.S. and European Community. As the 'plus' components incorporate patented technology, Brasilata believes that it will be possible to export it as a final product, namely processed steel with the previously mentioned advantages, thus escaping the penalties imposed on unprocessed steel.

6. THE PROTOTYPE TEAM

It is both difficult and easy to know who was finally responsible for this development that broke a 90-year-old paradigm. It is difficult to find the name of an inventor or of an exclusive team and; easy, if the company's practice is considered. The company considers itself to be like a team that plays a team game as opposed to an individual one. 'We play soccer, not tennis', says Brasilata CEO, 'and, in a soccer game, the leading scorer should not be paid for each goal scored, otherwise, who would want to be the goalkeeper? Unlike tennis or any other individual sport in which the points and victories belong to the player, in soccer they belong to the team.' This innovation policy based on the participatory business model with a strong presence of the shop floor has recently acquired a new component: the Prototype Team, composed of five technicians, four of which are members of the team that conceived the final stages of Closure Plus.

Brasilata has always counted on its structure with a small Project Department, known internally as 'Technical Department'. In the past, its functions were mainly the elaboration and storage of the sketches of fundamental machine and tool components. Basically, the structure of this department

consisted of a technician and a planner (in a not so distant past, before the advent of project systems, with the aid of personal computers – CAD, also by some designers). In 1993, when Brasilata started working on the introduction of the First Open system for 18-liter square cans, the project was really basically the sheer elaboration of a new tool. Everything took a very natural course - the sketch was made by the Technical Department and executed by the toolshop. When, in 1994, the head of the Technical Department proposed the solution that would later be named 'First Open Plus', due to the radical change, the project was a great deal more complex. In order to implement the project, the head of the Technical Department together with the head of the toolshop and even the Production Manager had to work together.

In 1995, with the new idea of applying the solution for 'First Open Plus' to round cans, the need for creating a structure to manage the development process of new products became apparent. In that same year, Brasilata was going through a unique process of participative reengineering. It was then decided that Brasilata would have an area specifically for Product Development, which was reporting to directly to the CEO. Such an area was composed of a small project sector and another one of prototypes, both apart from the daily plant operations activities. The projects sector was then named Product Development Support Department and was occupied by the head of the former 'Technical Department', whereas the Prototype Team started being coordinated by the head of the toolshop, an experienced technician who was about to retire.

The new structure soon proved to be extremely efficient. The Prototype Team was composed, in addition to the experienced technician, by three of the best toolmakers, who were chosen mainly for their creativity. Integration with the whole structure of the shop floor was excellent. Thus, even before the same product was completely defined, with the specifications of the project not yet finalized, not only were the first prototypes of the new revolutionary Closure Plus produced, but also a truly experimental series (10,000 units at a time) was produced with temporary tools. In order for this to take place, Brasilata's Management explained to all the great advantages that the company would have if the system succeeded, but without any doubts the successful integration of the Prototype Team was fundamental.

Once the critical period was over and, with the success of Closure Plus, a unique problem arose. The Prototype Team had spent almost a year directly involved with the process of producing 'plus', mainly due to the need to perform constant adjustments in the stamping tools and define final specifications for the process. The plant employees were comfortable in their situation, 'they' (members of the Prototype Team) as they were considered to be the parents of 'plus' and therefore responsible for it, were constantly called upon to solve other routine problems related to the manufacturing of 'plus', now in a commercial basis. The interesting fact is that it was almost as difficult to convince the plant employees, as it was to convince the Prototype Team that it was time for them to be away from 'plus'. Still today, the Prototype Team is composed of its original technicians. This sector was installed in an area totally separated by the toolshop and is a real mini can factory using a lot of the old manual equipment that was restored. It is today a corporate area and its job is to materialize new product ideas, which, many times come from plant employees.

7. FINAL CONSIDERATIONS

Companies in the steel can industry generally innovate incrementally or improve processes in order to reduce costs and improve quality, as is typical of an industry that relies on suppliers. These innovations are a result of the learning that comes from dealing with materials, equipment, people and information. This enables a reduction of manufacturing costs. Nevertheless, the advantages are seldom retained by the companies that have accomplished such improvements; they will be shared with others by the manufacturers of machinery and equipment. In addition to that, companies in this industry are squeezed between other competitive forces: clients, CSN, packaging manufacturers that use other materials, as well as other manufacturers of steel cans. For this reason, these innovations are not enough to support a long-term competitive strategy. The product innovations, not only in functional and esthetical terms, as common in any segment of the packaging industry, but innovations that are technically new, for instance Closure Plus, have become important sources of competition for the steel can industry, as well as a necessary instrument to deter the process of substitution by another material.

With this in mind, Brasilata conceived an innovation policy that supports itself in two pillars. One of them are incentives to the continuous performance of incremental innovations based on learning during the manufacturing and commercialization of its products. The other is upgrading of its products

through a pro-active posture in terms of development of new products to solve its clients' problems through new technical solutions incorporated in the steel cans. In order to do so, Brasilata has recently created a Prototype Team as part of an evolutionary stage of its effort to innovate by getting its employees involved. Along these lines, Brasilata is no longer only a can manufacturer, but also a developer of new technologies that have market value. Today, Brasilata counts on royalties and other revenues from its inventions. These two pillars that support the innovation policy of Brasilata are based on a participative management model that stimulates creativity and the compromise with all its employees.

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