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**Tetra Pak**  
**member of the**  
**Tetra Pak Alfa-Laval**  
**Group**

"Those who live hidden, live well."  
Motto of the Rausing family.<sup>1</sup>

"A package should save more than it costs."  
Ruben Rausing.<sup>2</sup>

"Every company is run to make a profit. If it does not it will die. But it has to supply some kind of service to the benefit of society."  
Hans Rausing.<sup>3</sup>

"The things we provide, the things we make, the things we shall sell, are things that are necessary to people. They need us."  
Hans Rausing.<sup>4</sup>

Amsterdam, August 17, 1992.

Hans Heerings.

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**"Those who live hidden, live well."**

This 'company profile' of the recently merged companies Tetra Pak and Alfa-Laval is made out of a multitude of information sources which lay primarily outside the two companies involved. The main reason for this is the restricted information policy of, notably, the Tetra Pak group. As a consequence there is no guarantee of the correctness of all data provided in this paper. In many instances it was impossible to double check data, and information is most often quoted as it was found in newspapers and professional journals (see for references in the foot-notes at the back of this paper). Because of the lack of information about Tetra Pak most of the research time has been spent on this company and less on Alfa - Laval.

One of the reasons of the lack of public information about the company is the fact that the Tetra Pak group is still a family concern and is not publicly quoted. The final owners are Hans and Gad Rausing, the two sons of Ruben Rausing, the founder of Tetra Pak. So there is no need to communicate information with other investors.

The opposite was true with Alfa-Laval. Before it was taken over by the Rausing family in 1991, the shares were quoted on the stock market. Alfa-Laval circulated its Annual Report to the outside world and was more informative to the financial world.

The Rausing family dislike public attention. And they have been hugely successful in the thing that they prize most, even above their fortune: the elusive art of privacy. One Stockholm socialite put it this way: 'Show anyone in Sweden a picture of the brothers - after all, they are two of Sweden's most extraordinary exports - and they will say: 'Who are they?' Forget the money - the brothers want to keep it that way.<sup>5</sup> One of their motto's is 'Those who live hidden, live well.' This attitude has become the common attitude and deliberate policy of the company as a whole. Public relations are extremely well coordinated and monitored. Nobody circulates information without consent of the regional (for example European) headquarters. The family and thus the company refuses to talk about profit, which is one of the best held secrets of the company.

## **PART I. THE EMERGENCE OF THE TETRA PAK ALFA-LAVAL GROUP.**

### **1. Historical development.**

In January 1991 Tetra Pak announced its SKr16.25 billion (£1.6 billion) takeover bid of Alfa-Laval. Before we go into more details of this merger we will first have a short glance of the history of both companies.

Both companies have built global organisations from one idea - Gustaf de Laval's continuously working separator invented in 1877 and Ruben Rausing's device to form, fill and seal packages under the liquid level from a roll of packaging material.

#### **1.1. Tetra Pak.**

The Tetra Pak company started in 1951 in Lund with a single product - the tetrahedron-shaped package, renamed to Tetra Pak Standard - developed by Ruben Rausing in the late 1940s. Legend has it that Ruben Rausing developed the concept while watching his wife stuffing sausage casings.

The next major step after the Tetra Pak Standard was the discovery of the original aseptic carton packaging system in 1962 which made use of the 'cold' sterilisation method (with hydrogen peroxide, invented in the late 1950s). Treated milk could then stay fresh in the cartons for months at a time. Tetra Pak has kept its technological edge since then.<sup>6</sup>

The company expanded spectacularly following the introduction in 1969 of the revolutionary Tetra Brik Aseptic packaging system. This allowed liquids to be hermetically sealed in cartons.<sup>7</sup>

Ruben Rausing did not allow Tetra Pak to diversify away from the packaging of beverages and other liquid food. The company refused to package non food products so as to preserve its image of health and hygiene which is of crucial importance in the milk market. That imperative presented management with quite a challenge. Boxed into the beverage field, how was Tetra Pak to grow? The answer: Keep expanding at a feverish pace outside Sweden.

Between 1974 and 1980, Rausing's invention had caught on big in Europe and Japan. During those years, Tetra Pak's sales grew at a 30% annual rate. The logical next step was to push aggressively into the US milk-packaging market.<sup>8</sup>

To escape high succession rights (up to 60%) the two sons of Ruben Rausing, Hans and Gad, moved the headquarters of the company to Lausanne when their father died in 1983.<sup>9</sup> (The Rausing's don't live in their native Sweden, but in Britain).<sup>10</sup>

In the forty years of its existence the company was extremely successful. It became one of the largest packaging groups in the world and has become a truly global company.

The company is still wholly-owned by the Rausing's making them one of Europe's richest families. Estimates of their wealth range from \$3.5 billion (£2.1 billion) to almost \$10 billion although this is somewhat notional as the family has no intention of selling and ploughs all its dividends back into the company.<sup>11</sup>

The family fortune is controlled through a Liechtenstein foundation and a Dutch holding company. The guidelines of the foundation rule out a takeover by a hostile bidder or any change in its primary business, packaging.<sup>12</sup>

## 1.2. Alaf-Laval.

In 1878 Gustaf de Laval was granted a patent for his continuous milk separator, the product which led to the foundation of AB Separator (1883), later to become Alfa-Laval. For over a century, the company's name has been synonymous with the development of separators, milking machines and plate heat exchangers.

Right from the beginning de Laval and his associate Lamm had their eye on the export market for their cream separator. First exports went to Germany, England, The Netherlands and Russia. In the USA a subsidiary was started as early as 1883 and local production commenced in 1892. The American subsidiary played a very significant part in financing the Group in Europe in the beginning of this century. After 1927 company sales were strongly effected by the economic crisis. The power separators, those driven by electricity, were increasing their sales volume but not sufficiently to compensate for the decline in manual separators. AB Separator was obliged to broaden its product programme. One of the ventures was milking machines. The 1930s saw the first demands for pasteurisation of milk. It was decided to start development and production in Germany of a plate heat exchanger specially designed for the pasteurisation of milk. Immediately before the outbreak of the war, the German operations were relocated to Lund. Separators and heat exchangers started to be used in all manner of process industries. And after world war II AB Separator diversified its traditional areas of expertise. In 1963 the company changed its name to Alfa-Laval AB. Sales of separators and heat exchangers have grown considerably. Often they comprise the nucleus of the processes that Alfa-Laval supplied. These processes often required process control systems Alfa-Laval started to develop. And stage by stage the company developed to the position of a supplier of comprehensive plants and turnkey projects.<sup>13</sup>

Presently Alfa-Laval is one of the world's leading companies in the design, manufacturing and marketing of stand-alone engineering equipment and integrated processing systems for the food industry. Around its two core technologies, separation and heat exchange, it has developed acknowledged international leadership and a wide variety of applications in the food industry, particularly in all aspects of fluid engineering, from milk to beer, cheese to chocolate, sauces to soups, fruit juices to ice cream.

A continuing commitment to research and development has underpinned these core technologies and enabled the group to maintain its position of global leadership. In addition to an annual R&D budget of £50 million to fund this organic growth, Alfa-Laval has also pursued a policy of growth by acquisitions, which has seen the group strengthen and broaden its range of equipment and services to the food industry with over 20 major acquisitions in the UK, Europe and the US during the 1980s and the beginning of the 1990s.<sup>14</sup>

Until July 1991 Alfa Laval shares were publicly quoted. Institutional owners held approximately 75 per cent of the shares (approximately 80 per cent of the voting rights). The Lundberg and Wallenberg families held a substantial stake and larger voting rights. So the Rausing family, owner of Tetra Pak, bought out Alfa-Laval's Wallenberg and Lundberg families. Wallenberg used the proceeds from the sale of his stake in Alfa-Laval to secure the interest in Saab-Scania. The Wallenbergs are beset with mounting debt and high interest rates, which has weakened their defensive posture against corporate raiders.<sup>15</sup>

### 1.3. The takeover.

After the announcement of the bid of Tetra Pak to take over Alfa-Laval in the beginning of 1991, the European Commission launched in March one of the first in-depth inquiries under its six-month-old takeover rules for large takeovers.<sup>1</sup> The Tetra Pak group is a producer of packaging machines and materials. Alfa-Laval is a manufacturer of food, agricultural and industrial process equipment. The new combination would be able to supply dairies, for example, with an entire cow-to-carton production line. With Alfa-Laval supplying the milk processing equipment and Tetra Pak the milk filling machines and milk cartons. The EC's concern was that competitors either in the food processing or packaging equipment sector would be disadvantaged if the merged company offered a package deal including, for example, Alfa-Laval equipment at below the commercial price. Similarly, competitors could have lost out if Tetra Pak and Alfa designed equipment that could only be linked to each other's products.

But the Commission said that its inquiry had shown that

"the ability to offer both types of machines under a single aegis would not materially benefit the merged undertaking compared to its non-integrated competitors".

However Swedish and EC approval of the acquisition came only after Alfa-Laval and Tetra Pak promised to pursue independent marketing programs. The companies agreed to submit separate bids at a customer's request in situations where both companies could supply equipment or a service, and not to make sales of, say, processing machinery dependent on orders for packaging machinery. They also promised to make equipment compatible with competitors' products. According to president and chief executive Mr. Hagman, Tetra Pak made the promises because that was what the food industry would demand from it.<sup>16</sup>

Suspension of the bid was already lifted at the end of May and July the 23rd Tetra Pak received formal EC approval for the takeover.

The new company was named The Tetra-Pak Alfa-Laval group and has a combined turnover of about SKr50 billion per year, employing 34,000 people. It has overwhelming dominance in the European market for (especially aseptic liquid food carton) packaging materials and machinery for dairy products. Profitability of the

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<sup>1</sup> Sweden agreed to the merger in February 1991.

new group is not known, it is believed to be high - probably over 10 per cent of turnover.<sup>17</sup>

## 2. Proces and products.

### 2.1. Tetra Pak.

Until the takeover of Alfa Laval, Tetra Pak was unlike many multinationals not diversified but specialised in production of aseptic and non-aseptic carton packages for liquid food and the filling and sealing machinery that goes with it.

The basic concept of the products of the Tetra Pak company remained the same over more than 40 years: A board tube is head sealed at intervals through the liquid it contains and formed into a brick shaped pack with no headspace.<sup>18</sup> The entire process is continuous and takes place in a single machine that shapes and fills the package.

The principle technical developments have been associated with the introduction of new packaging materials, shapes and size ranges, filling machines, carton styles and improved handling equipment.

- The Tetrahedron-shaped package was introduced in 1952 and is known as the **Tetra Classic** (or Standard). It was formed from a roll of PE coated board, wound into a tube during the filling process and then sealed through the liquid contents so that no air was trapped inside.
- The same basic principle is used to form the rectangular **Tetra Brik**. First launched in 1963,
- The **aseptic version** of the **Tetra brik** dates back to 1969/70. The aseptic Tetra Brik use a six layer laminate. The laminate consists of an outside polyethylene (PE) coating, printing ink, paper, a laminated PE layer, aluminum foil and 2 internal PE coating layers, or 75% paper, 20% PE and 5% aluminum foil by weight. The 'Tetra Brick Aseptic', or TBA, is used for juices, wine, flavoured beverages, dairy drinks and other liquid foods. The most common size is the 1-litre carton but more and more different size are available.<sup>19</sup>
- **Tetra Rex** introduced in 1965, is a more traditional package with a pointed or flat top, used for pasteurised products, (e.g. milk).
- **Tetra King** dates back to 1981 and is based on an expanded PS laminate, and is used mainly for specialised dairy products. It features a reclosable pull-tab or a lid and is mainly used for specialised dairy products.
- **Tetra Top** is the newest package within the range; it is reclosable and is available in round and square versions. This package was launched in a 1 lt aseptic version as well.<sup>20</sup> It has a pull-tab opening with a plastic lip for pouring, and another used as an air vent.<sup>21</sup>

In the multilayer liquid aseptic cartons the polyethylene layer is the only material to be directly in contact with the product packaged. The board makes the packaging firm, the plastic renders it hermetic and the aluminium protects the product from light and oxygen and enables the packaging to be sealed by induction from outside.<sup>22</sup>

Tetra Pak operates a production line which converts the carton directly from a roll

of the board, fills it and vacuum seals it in one continuous operation (other companies deliver pre-formed cartons to the clients for filling). The method is totally airfree.

Tetra Pak manufactures the rolls of packaging materials in its 29 packaging materials factories and produces the filling machines in its 6 machine assembly plants. The company supplies some six making systems machinery for forming and filling the packs. The machines are rented to its customers, and serviced through its own service centres. Tetra Pak also produces equipment to facilitate the handling and storage of filled packages.<sup>23</sup>

The aseptic Tetra Brik (TBA) is by far the most widely used package for long life products and at the end of 1990 Tetra Pak reported that, worldwide, Tetra Brik aseptic cartons account for over 70% of all Tetra Pak containers.<sup>24</sup>

Because Tetra Pak seals through the pack contents it is not suitable for products containing particulates, which however present a growing sector of the market.<sup>25</sup> Recently however Tetra Pak succeeded in developing its filling and sealing system to package particulate products. This breakthrough offers opportunities in new foodstuffs as well as competition to the canning industry.<sup>26</sup>

The first new application is in petfood: a 500ml Tetra Brik Aseptic carton 400g of petfood with headspace, containing larger particulates than previously believed possible. Switzerland is the launch market.<sup>27</sup><sup>2</sup>

## 2.2. Alfa-Laval

The Alfa-Laval Group comprises three operating areas: Industry, Food and Agri.

The Industry operating area contains five business areas: Automation, Dosing & Analyzing, Flow Equipment, Separation, and Thermal Equipment.

The product program includes equipment for separating liquids, heat exchangers, dosing systems, equipment for analyzing of liquids and gasses, equipment to control and handle flow, and computerized monitoring and control equipment. The products are sold to almost all industrial sectors with the main focus on the engineering industry, shipbuilding process and food industries. The food industry has a special position since the products are often key components in complete plants supplied by the Food operating area.

The Food operating area's product program includes complete lines and individual components for the food industry. The products are used for manufacture,

<sup>2</sup> Like Tetra Pak, PKL/Combibloc, has recorded a number of firsts in product launches - particularly in sauces, soups and other particulate-containing foods. Elopak, the third of the carton giants, has so far been content to see most of its growth come from the non-aseptic fresh milk and juice sector, but the company is actively progressing plans in the aseptic field and further disclosures are expected this autumn. "Aseptic success." Packaging Week. April 29, 1992.

storage pasteurisation, etc., of dairy products and fruit juices, oils and fats, wine and beer, fish and meat and a wide range of other food. Convenience food is rapidly growing. A number of strategic acquisitions have placed Alfa-Laval in a strong position in this sector.

The focus in the agri operating area has gradually shifted from the manufacture of components to a full service company for dairy farmers.<sup>28</sup>

For an overview of subsidiaries see Appendix I.

### 2.3. the 'T-shape'- technology led integration.

Mr. Storm (director Elopak) stated in an interview that the Tetra Pak / Alfa-Laval merger on the one hand meant a change in Tetra Pak's strategy to be only committed to a limited, but clearly defined market. On the other hand, he said, the unification of process and packaging technology is, from a general point of view, is an obvious idea.<sup>29</sup> Process technology can make a leap forward and packaging industry as well.<sup>30</sup>

Bertil Hagman, former Chief Executive Officer, emphasised this second point when stating: "The most important aim of Tetra Pak has always been to become and remain one of the world leaders in packaging and distribution of food. On short term strategy however was aimed on liquid food. Key term here was the development and establish integrated packaging and distribution systems." According to Mr. Hagman a point came within sight from which further development of packaging and distribution systems would only function when integrated with processing systems. The takeover was a prerequisite for further growth for both companies. So instead of developing separate technologies, the new objective is to level technical barriers between the two companies. From now on both companies must think as well as producer, packager and distributor of food.<sup>31</sup>

Instead of combining fully, Tetra Pak and Alfa Laval are remaining separate.<sup>3</sup> Their relationship is assuming a T-shape, with vertically integrated Tetra Pak providing the downstroke, and horizontally-integrated Alfa-Laval the cross-stroke. In technology terms, the link stands where the two strokes meet, with liquid food - its processing, packaging and distribution - providing the connection.

There is little doubt that the unusual structure helped the two companies sidestep an assault from Brussels that focused on such links. The Commission had

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<sup>3</sup> The group's two operating companies will be AB Tetra Pak and Alfa-Laval AB. The first of July 1991, a new financial holding company was founded in the Netherlands named "Tetra Pak Alfa-Laval Capital B.V." Address: Amsteldijk 166. 1079 LH Amsterdam. Netherlands. Managing directors: Mr. Olsen, Mr. van Gend and Mr. Seiler. The company has a registered capital of 1.25 billion guilders, divided in 1.25 million shares of 1000 Dutch guilders each. (1 dollar is approx. 1.7 guilders).  
Chamber of Commerce Amsterdam. File no. 63580.

apparently decided that it had no authority to make a ruling on the merger because it was neither a horizontal nor a vertical combination. The two companies had, in any case, promised not to act anti-competitively in the market place.

This however does not prevent the development of links between the two companies. The aim of these links is to build on connections between the two companies. To establish these, two parallel series of discussions have begun between the two companies.

The first links Tetra Pak with different parts of Alfa-Laval's food business via separate project groups in liquid foods, convenience foods, ice cream and other areas. In general the focus will be initially on improvement of pre-process equipment and after this on the intersection of packaging/distribution systems and process systems. For example the aseptic packaging of fast food. Furthermore, both companies are strong in the dairy sector and in aseptic packaging and their paths have already crossed on big projects. The intention is that in the medium-term the discussions could produce 'new technological solutions that give customers a distinct competitive advantage'.

The second initiative involves project groups aiming to find synergies between Tetra Pak and Alfa-Laval's non-food activities such as control equipment and heat exchangers, many of which number food equipment among their applications. Alfa Laval for example, has developed a new process for heat treatment of liquid egg that could link with Tetra Pak's continued efforts to find new applications for its cartons. An other example is the linking of Tetra Pak with Alfa Laval's process control subsidiary SattControl. This company is producing self regulating filling machines while Tetra Pak being its most important customer. Both companies will start developing now self regulating, maintaining and repairing filling machines.

Besides synergies at divisional level and in product and technological development, partial integration is establishing on the group management and staff level. January 1, 1992 both Tetra Pak and Alfa Laval shared new administrative offices in Lund under separate management structures. Alfa-Laval's financial department has been closed down.<sup>4</sup>

It seems that for the future the priority for the two companies is to exploit opportunities arising from sharing knowledge and offer 'integrated solutions' for a food industry that increasingly wants large processing plants built for them on a turnkey basis. That is, Alfa-Laval supplying the process equipment that produces liquid food that is then packaged in Tetra Pak's machines and cartons. Now that the companies have merged it should be easier to develop new liquid food technologies or new approaches to total automation of food processing.<sup>32</sup>

<sup>4</sup> Mr Bertil Hagman, president and chief executive of Tetra Pak, said: "The reason for having both companies' headquarters in the same place is to optimise the operations between Tetra-Pak and Alfa-Laval, Sweden's decision to supply for EC membership, the proposed new bridge link between Malmo and Copenhagen and the institution of a major tax reform plan in Sweden positively affected our decision to relocate."

The European. December 6, 1991. / "Tetra Pak returns base to Sweden." Financial Times. August 21, 1991.

Lat but not least both companies intent to support each other in markets in which one of the two has a relatively weak position: in Japan (Tetra Pak) and USA (alfa Laval).

## PART II. THE TETRA PAK GROUP.

### 1. Basic information.

#### 1.1. Tetra Pak basic statistics.

Basic statistics of Tetra Pak in the last few years are as follows.<sup>33</sup>

Table 1: Tetra Pak, worldwide statistics. End of the year.

	1989	1990	1991
- Machines in operation	5,900		6,520
Of which aseptic machines	3,525		
- Machine assembly factories	6	6	6
- Packaging material factories	28	28	29
- Factories in the EC	16		
- Service centres	45		
- Marketing companies	47		52
- R&D centres	11		14
- Markets covered	102	109	112
- Employees	11,000	12,300	
- Employees in Sweden	2,700		
- Packages produced in the year (bn)	49	57	60
- Turnover in the year (bn)	Swfr5	\$4.2	\$4.8

Tetra Pak is the fourth packaging company in the world. The company claims it has 4 per cent of the world market for liquid food packaging products. It also says it has 14 per cent of the European market.<sup>34</sup>

Tetra Pak is the biggest buyer of paper in the world.<sup>35</sup> Main supplier of paperboard to Tetra Pak in Europe (170.000 tons per year) is the paper and carton factory Korsnäs located at Gävle in Sweden.<sup>36</sup> Recently Tetra Pak is buying coated paper in Eastern Europe from the Kwidzyn Pulp and Paper Company Poland's only integrated bleached pulp and paper company.<sup>5</sup>

A Large part of Tetra Pak's employees are engaged in R&D activities (one information source mentioned almost 10 per cent).<sup>37</sup>

The policy of Tetra Pak is to manufacture packaging materials locally where demand

<sup>5</sup> The Korsnäs mill bleaches wood pulp without using chlorine. It has four paper-making lines, produces 480k t/y board or paper. Waste cartons are dumped as landfill or incinerated, a popular new method. "Wholly Green Giant." In: Food Processing. Nov. 1990. p. 189.

is thought to justify operations.<sup>6</sup>

A lesser number machine assembly plants are located in the main market area's. The service centres are spread over the countries where Tetra Pak Machines are installed.

About 90 percent of the turnover in 1990 was in packages while 10 percent was in packaging machines.<sup>38</sup>

## 1.2. Top management.

The following persons participate in the top management of the Tetra Pak Group.

Uno Kjellberg,	President/Chief Executive Officer (CEO) of the Tetra Pak group.
Hans Rausing,	CEO of the Tetra Pak group. He plays a more active role running the group since the acquisition of Alfa Laval. He followed Bertil Hagman who left in november 1991. Until then Rausing was chairman.
Jorgen Haglind,	Communications director.
Other managers.	
Claes Nermark,	Vice President marketing and information services (Tetra Pak International).
J. Marcks von Würtemberg,	Vice president environmental affairs of Tetra Pak (Switzerland).
Gunnar Brock,	President for Africa.
Jaime Santafé,	Director foreign affairs and the environment, Tetra Pak Spain.
David Bradwell,	Vice president of marketing/environment, Tetra Pak Canada.
Carl-Viggo Ostlund,	President Tetra Pak Canada..
Trond Indseth,	Managing director of Tetra Pak Australia.
Bengt Bison Sjogren,	President/CEO of Tetra Pak Inc.
Alfred van Sprang,	Head environmental affairs (Tetra Pak Netherlands).
Jean-Louis Vuille	Managing directory Tetra Pak Hungary.

<sup>6</sup> Turning out more than 14 million cartons a day is a materials-hungry operation. For example the Tetra Pak UK Wrexham plant uses 60,814 tonnes of paper; 12,908 tonnes of PE, 2,048 tonnes of aluminium foil and 673 tonnes of ink each year.  
"Tetra Pak Wrexham just keeps on growing." In: Packaging Week. 29 April. 1992.

### 1.3. Financial performance.

Tetra Pak is highly secretive about its financial performance. Management does not provide serious reasons for this. For example Bertil Hagman, the former chief executive officer, stated on this issue: "We have tried to avoid talking about profits simply because if the profits are bad it creates unnecessary worry about the future of the company; and if the profits are good, it may stimulate our suppliers to increase prices unnecessarily." He suggested that privately-owned companies can plough profits back into research and development, and long-term gain need not be sacrificed to short-term performance.<sup>39</sup>

If the Rausing's won't discuss margins, others will. But estimates differ widely. Analysts have suggested that **pretax** profits may have been between 15 and 17 percent of turnover (In 1989 \$700 and in 1990 around \$800 million).<sup>40</sup>

Aaron Brody, management consultant with Scotland Business Research of Princeton, NJ, considers Tetra Pak the most profitable folding carton maker in the world: 'What goes into their plants costs 6 cents to 7 cents, total, and what goes out sells for 10 cents,' for an **operating** profit approaching 40%. Other carton companies, Brody explains, are lucky to make 20%. Moreover, the company's sales grew by a healthy 18% in 1989.<sup>41</sup>

The huge financial capability of Tetra Pak is illustrated by the fact that it payed about 50% above market value for the acquired Alfa-Laval shares,<sup>7</sup> and that it financed the purchase from internal funds.<sup>42</sup>

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<sup>7</sup> According to Hagman the bit was based on a market quotation of Alfa-Laval shares of 6 months before the deal was concluded.

"Samenwerking Tetra Pak en Alfa Laval in wereld voedselproductie". In: Misset Pakblad. May 1991, p. 53.

## 2. Industrial strategy.

### 2.1. The end of high growth rates in Western Europe.

Tetra Pak largest market is Europe (54 per cent of turnover), followed by Asia (26 per cent), North and South America (12 per cent) and Africa (5 per cent). (figures 1989).<sup>43</sup> But for various reasons the Western European market gets saturated:

- Although the aseptic carton packaging industry worldwide was looking for annual growth in 1990 of 6-8 percent, the main growth areas lay outside Western Europe: in Eastern Europe, Asia and the USA.<sup>44</sup>

Moreover environmental legislation and environmental awareness with the consumer has brought in several countries in Western Europe the fast growth of liquid cartons of the last decades to an end, in favour of returnable packaging (glass bottle, PET bottle).

- Moreover Tetra Pak has reached in its two major market segments, dairy (aseptic and non-aseptic)<sup>8</sup> and fruit juices (aseptic), maximum achievable market shares. Some global estimates put for example aseptic packages world usage at about 40-50 billion units or 30 billion litres/year, with the West European market accounting for about half. But in Western Europe Tetra Pak has reached a near monopoly position (around 90 per cent).<sup>45</sup> The market share for non-aseptic carton packages is substantial (between 35 and 45 per cent).

So there is hardly room to grow in non-aseptic (milk) packaging or it must be at the expense of its competitors.<sup>9</sup>

One of the ways Tetra Pak has established its dominant position in the past in different West European countries was by means of illegal practices vis a vis its competitors.

In July 1991, the European Commission fined the company a record Ecu75m (\$88m, £52.8m) for abusing its dominant market position in western Europe claiming Tetra Pak had pursued a 'deliberate policy aiming to eliminate actual or potential competitors.'<sup>10</sup>

In a reaction on the condemnation Tetra Pak said it is making some changes in its contracts to address some of the commission's concerns, including codifying the customers' choices between purchase or lease of packaging systems 'within a framework of assuring the safety and reliability' of the systems.<sup>46</sup> However part of

<sup>8</sup> Of the different pack types, Tetra Pak's Tetra Brik dominates with the company reported to hold 90 per cent of the West European market for aseptic milk packs.

<sup>9</sup> Main competitors in Europe are PKL/Combibloc, recently taken over by the Swiss company SIG, and the Norwegian based Elopak.

<sup>10</sup> It was the companies' second breach of the EC treaty in 10 years. An EC official said the offence had been aggravated, because Tetra Pak had already broken the treaty rules on abuse of a dominant position. The Commission rebuked Tetra Pak after a 1988 investigation but decided not to impose a fine because it wanted to establish its legal position. That position was unsuccessfully challenged by Tetra Pak in the European Court in 1990.

"Tetra Pak faces big fine from Brussels." Financial Times. July 24, 1991.

the practices of Tetra Pak are common within the industry.

Presently the 'legal' industrial strategy focuses on:

- Penetration of new market segments like wine, (still) mineral waters, dogs food (partly on the basis of technology development). See part I.
- Technical integration with food processing through the merger with Alfa Laval, and subsequent marketing of total food processing, packaging and distribution systems. See part I.
- Continuous improvement of existing products.
- Expansion in (potential) growth markets. Notably Eastern Germany, the United States and Asia.
- A vigorous reaction on the legal ban of liquid cartons in two states in the USA and on the introduction of waste legislation in Western Europe. This comprises
  - + the introduction and promotion of collection schemes and recycling initiatives.
  - + a very active Public Relations policy in the United States and Western Europe.
  - + cooperation in this with its competitors PKL/Combibloc and Elopak (a.o.).
- Optimisation of the production process in a continually effort to improve quality and cost and performance.

## 2.2. Future product development.

There is likely to be continued development and innovation in the liquid and aseptic carton market, especially in connection with the developments currently in progress to pack particulate products in cartons. In this connection there is likely to be increasing use of raw material substrate with coextruded film replacing aluminium foil laminated board structures, thus facilitating the use of cartons in microwave ovens.

With the development of different sizes, there will be a need for new tear tabs and easy opening features and a further range of profile/dimension options can be confidently expected.

Filling machine size and speed will continue to increase and more sophisticated techniques will be developed for downstream wrapping and collation systems. Decoration will be improved with further development of Web offset litho printing together with electron beam curing.

The speed of development of the new markets depend upon major R&D investments by food equipment manufacturers, food processors and package manufacturers as well as consumer acceptance.

The Tetra Pak Alfa-Laval combination has taken the lead in the development of new integrated liquid food processing, packaging and distribution technologies and new approaches to total automation of food processing.

In the future total systems concept carton packaging may disappear. Bertil Hagman

(former CEO) stated on this: "Our policy is to protect the world food supply with the best possible means and not to protect the interests of carton." The same goes for the self imposed restriction to liquid food. "This was short term policy. We always aimed to be a total packager and distributor." (...) "We already set in motion developments in soup and food with high viscosity." (...) "The first sectors to develop are those that require high quality packaging like milk. First thing to do here is to further develop process and packaging technology. After this we contemplate juices, water, edible oils and so on." <sup>47</sup>

### 2.3. Tetra Pak in Central and Eastern Europe.

In comparison with Western Europe, the packaging industry in Eastern Europe is under developed. The EIU-report on the market, prepared by the Budapest-based Echo consultancy<sup>48</sup>, says that investment in packaging always had a low priority. This resulted for example in the former Soviet Union in an estimated 25 percent loss of total food produced.

But despite the great potential in Eastern Europe, companies have, until now, shown little interest in carrying out direct investments, mainly due to the political uncertainty and financial risk.

From 1988 on Tetra Pak actively perused to set up production facilities in Eastern Europe. First in the former Soviet Union and in Hungary.

These projects can be seen as a first anticipation of stagnating demand in the West European markets in which Tetra Pak realized maximum seizable market shares in its traditional product area's (especially milk) and as the logical extension of Tetra Pak's policy to manufacture locally where demand is thought to justify operations.

And from 1989 on, after the collapse of the communist system in the other East European countries and the Soviet Union the same logic persuaded Tetra Pak to double its efforts and to develop a production base in other countries as well. But this time Tetra Pak not only tries to open up a new market from a local production plant, but aims to establish a production and distribution system of packaging materials factories and filling and sealing machines assembly plants and service centra comparable with that in Western Europe and the United States. See table below. The imports of base board by Tetra Pak's packaging materials plants will be (probably partly) switched from the nordic countries to Poland.

Table 2: Involvement of Tetra Pak in Central and Eastern Europe.

Country / location	Year of agreem.	Type of company	Sales office	Packaging factory	Machine assembly	Service centre	Food processing / distribution
Ukraine / Kiev	1988	JV		X			
Ukraine / Lipetsk	1988	JV					X
Hungary / Budaörs	1988	JV	X	X		X	
Poland / Kielce	1989	JV		X			X
Russia / Podolsk	1990	JV		X	X	X	
Slovakia / Skalica	1991	JV		X			
Rumania / ?	1991		X				
Russia / Kuban*	1992	JV		X			X
Bulgaria / ?*	1992	?			X		

\* negotiation phase.

Tetra Pak has invested SKr1.5bn in three joint ventures in the former Soviet Union: in Lipetsk, Podolsk and Kiev (and recently Kuban). It also plans further investment of more than SKr2bn making it one of the biggest western investors in the region.<sup>11</sup>

It is interesting to note that Tetra Pak committed itself in an early phase to additional activities not undertaken in western countries by involving itself in joint ventures that process and distribute (packaged) food. So the company is not only involved in the production of packaging materials and in machine assembly (and renting) but in food processing and food distribution as well thereby creating the necessary outlets for its liquid food cartons.

The stakes are high. According to 'Marketpower, a UK research company, between 1990 and 1995 the value of the total packaging market is estimated to rise from Ecu37.8 billion to Ecu74 billion. Growth rates of 14 per cent per year are predicted in the Commonwealth of Independent States (CIS), Czechoslovakia and Poland, and even higher in the former East Germany. Although the overall market may increase significantly, individual segments are likely to perform very differently. The liquid food packaging belonging to the growth segments.

Hans Rausing, Chief Executive Officer of the Tetra Pak group is well aware of this situation stating that investments in the Soviet Union make commercial sense. He said in a interview with Financial Times<sup>49</sup> that Tetra Pak could win a sizeable share of a potentially huge market for a comparatively small outlay. 'If you were to try to achieve that same market share in the US it would cost you 10, maybe 100, times more,' he says. He believes commercial loans should be channelled through joint ventures. In his

<sup>11</sup> "Tetra pak believes it has a role to play in the new Soviet Union." Financial Times. September 2, 1991.

opinion Western governments could provide the loans in hard currency.<sup>12</sup> He sees Tetra Pak as a prime candidate for such loans. 'I can achieve a certain result with the means of Tetra Pak but if we are talking about large quick improvements in the food supply we need more money.

Especially in Russia, around Moscow (and St. Petersburg) the Tetra Pak Alfa-Laval group has formulated a plan and started discussions with authorities and officials in the CIS for major investments in processing, packaging and distributing of baby food. This scheme is part of a broader project proposed by a consortium of Tetra Pak, together with the Swedish Axel Johnson Group and the national farmers organization LRF to help former communist countries revamp their food systems. Next to this Tetra Pak want to start negotiations to obtain the necessary financing. from western governments and banks, and the Swedish government to obtain credit guarantees and contributions through a planned aid programme.

Whether and when these plans will materialize is unclear. Other packaging companies may have the same plans and will apply for western loans and guarantees. Anyhow, the packaging sector has been targeted as an area of strategic importance by national governments and investing institutions from the West, such as the European Bank for Reconstruction and Development (EBRD). They argue that good quality packaging will not only improve living standards within these countries, but will also facilitate the export of goods, enabling manufacturing companies to earn hard currency, vital for buying western capital plant to upgrade the manufacturing base.<sup>50</sup>

Tetra Pak commitment in the region dates back to 1958. The company has today operating 120 machines in the CIS and has established offices throughout the region. Alfa Laval has the same long standing relation but until now dit not invest in manufacturing capacity. Instead the company established sales offices in several countries.<sup>13</sup>

There is to be increased co-ordination between Tetra Pak and Alfa-Laval in Eastern Europe in 1992. Tetra-Laval is already well positioned in various Central and East European countries and will push hard to take advantage of this position. The company is already making necessary organisational changes and established this year a separate company (Tetra Pak Alfa-Laval Systems AB) to coordinate marketing in Russia and the Baltic states.<sup>51</sup>

Tetra Pak's involvement in Eastern Europe is prominent but not unique. To a lesser extend its major competitors move eastward as well.

One example is PKL/Combibloc Verpackungssysteme (Austrian branch). This company has set up in 1988 a joint ventures with six Hungarian companies, including two state farms, two agricultural cooperatives, a wine-making enterprise and a canning factory, covering the packaging of milk and fruit juices. PKL holds a 52 per cent stake in the joint venture, located near Budapest. The Austrian company supplies Combibloc

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<sup>12</sup> To be repaid in roubles - the collapse of Soviet exports making it impossible for the country to generate sufficient hard currency for the foreseeable future.

<sup>13</sup> Including. St. Petersburg and Budapest.

packaging technology, production equipment and knowhow as well as cardboard materials. The joint venture introduced Combibloc technology and exports semifinished cartons to other East European markets.<sup>52</sup>

Elopak (Norway) seems to have until now only exported milk-packaging lines and Packaging materials to Poland.<sup>53</sup>

It is interesting to note that Tetra Pak stresses the need to get food properly packed while little or no attention is given to the consequences for existing packaging systems and possible environmental problems. Hans Rausing stressed recently that packaging and distribution are vital, if food produced in the CIS is to reach the consumer.<sup>54</sup> He claimed on a conference on "International Packaging and the Environment" (March 23/24 1992) that he was "ashamed" to be participating in a debate about a "pseudo-problem" while ignoring the true problem of packaging - how to get food to the starving people of the world.<sup>55</sup>

#### 2.4. Environmental policy, recycling and public relations.

Tetra Pak claims to pursue a preventive environmental policy, based on circulating as little material as possible and trying to make its production process as non-pollutive as possible. The company is emphasizing its commitment to environmental protection, taken into account environmental issues in all stages of the product cycle. Already in 1985 a so called 'eco-balance' study was performed (by G. Sundström) to identify priority area's for improvement.

Still, from 1989 on, paperboard packaging and especially the laminated (aseptic) paperboard cartons of Tetra Pak came under fire from local and state governments and environmental pressure groups particularly in United States and in Western Europe. The debate about environmental aspects of packaging and waste problems has led in several West European countries to legislation aiming at recycling. Notably in Germany. In the United States Aseptic packaging was banned in two states in 1990 and 1991.

The public discussions about problems of environmental pollution of packaging and the growing awareness of consumers threatened, in several especially West European countries, sales volumes of liquid cartons which were already dampening because of saturation of the main market segments (dairy, juices).<sup>14</sup>

Tetra Pak (together with other producers) vigorously responded on the public discussions and legal actions.

Tetra Pak is involved in various R&D and commercial recycling projects. In most cases (see below) Tetra Pak has financed and/or developed technology but has established the recycling facilities with joint venture agreements. One cannot but conclude that Tetra Pak wants to limit financial involvement and risks and only wants to initiate recycling schemes.

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<sup>14</sup> In the Netherlands for example returnable glass bottles regained in 1991 part of their lost market share.

Table 3: Overview of Tetra Pak's involvement in R&amp;D and recycling initiatives.

Country	Agreement/initiative	Type of process	Product
Spain (1992)	Agreement with Nesa (Valencia) to recycle Tetra brik cartons.	Separation and recovering raw materials using water and ambient temperatures (no polluting additives).	Paper bags Cement bags.
	Fatec (mentrida) receives plastic residue.	Injection moulding	Trial stage.
Germany (1990)	Recycling plant of Tetra Pak in Diez with Uriel.	Construction	materials.
Austria (1990)	recycling scheme with Mayr Melnhof Karton (Vienna).		
Canada (1990)	Superwood with Markham, (Tetra Pak is main creditor of Superwood in Missisauga NO).	Recycling mixed plastics post and beverage boxes. Converting the plastic lumber.	FenceRoad markers and other products exposed to the elements.
	R&D supported by Tetra Pak.	Close-loop (i.e. box to box) recycling.	
	R&D at Forintek supported by Tetra Pak, and, Development of commercial scale plant with other partners.		Fibre board.
USA (1991)	Pilot project at Weyerhaeuser, longview, Washt. (pulp mill)	Recycling paper from beverage boxes.	Paper products.
Australia (1991)	Investigating commercial possibilities (with 'Chem Re-Action').	Recovering the paper content of beverage cartons.	paper chips
	Research & Development.	Removal of foil in aseptic cartons.	

## 2.5. Optimisation of the production process.

Process 'optimisation' has been a continuous development within Tetra Pak production plants in Europe. In the last five years it coincided in existing packaging materials plants with vast investment projects in capacity expansion. We take two examples from the Wrexham plant in the UK. The Wrexham plant appears to be a kind of testing plant for process automation.

### Process automation.

At Wrexham Tetra Pak is developing a £2 million robotic system for its Tetra Rex lines. This system eliminates the need for manual loading/unloading of the printers and side slitters used in Tetra Rex production. One line already features such a system, and if things go well robotics should be used on all three lines by next spring.

Wrexham is the first again with "NQUIRA", a computerised quality control system developed in-house. It is being tested in the site's raw materials laboratory, but is due to be used throughout the factory and, eventually, throughout the Tetra Pak group.<sup>56</sup>

### Printing.

Digital artwork & reproduction, or DAR technology allows designs and colour separated artwork and pictures to be electronically manipulated, replanned and transferred to suit different printing processes and products while maintaining range consistency and image quality.

Tetra Pak UK offers both repro and design services for customers using a studio set up in its Wrexham plant three years ago with Barco equipment. Concept work and new artwork can be produced on an Aesthedes system, while existing artwork can be manipulated on a recently installed Digipack system. Tetra Pak says 90 per cent of its repro requirements can now be handled in-house.

DAR can reduce the time it takes to turn round a design; helps reduce costs; ensures any changes are made quickly; helps to increase accuracy and quality; and reduces confusion between client, repro house and printer.

The technology is helping to deskill the pre-press process and making it attractive for the packaging producer - especially the bigger groups - to take on this role. Ultimately, the major retailers may decide to bring all production in-house; or perhaps a design, repro, printing and carton production operation could be formed to serve an electronic hole-in-the-wall operation. Such propositions may be fanciful - but DAR, and the associated technology, make it all realistic.<sup>57</sup>

## Appendix I. Overview of subsidiaries of Alfa-Laval AB.

ALFA-LAVAL AB, Box 12150, S-10224 Stockholm 4 Tel: 08-80 99 00	3523, 3585, 5063, 5072, 5074		
A-L (East Asia) Ltd.	Taiwan	B & L Industrie Automation Beteiligungs- GmbH	West Germany
ALPRO Info Services AB (A)		Bran + Luebbe GmbH	Austria
AL Tie Inc. (A)	U.S.A.	Bran + Luebbe Inc.	U.S.A.
Agri Shop GmbH	West Germany	Bran + Luebbe (Great Britain) Ltd.	U.K.
Westal France S.A.	France	Bran + Luebbe Industrie Automation GmbH & Co.	West Germany
Westal Versand AG	Switzerland	Bran + Luebbe S.A.R.L.	France
Albia Hydrocyclones Inc.	Canada	Bran + Luebbe S.L.	Spain
Alfa-Fastigheter AB		Bran + Luebbe S.r.l.	Italy
Alfa-Laval AG	Austria	Lavrids Knudsen Handelsgesellschaft GmbH	West Germany
Manus Landmaschinen Vertriebsgesellschaft mbH	Austria	Alfa-Laval International AB	
Westfalia Werkzeug Co. GmbH	Austria	Alfa-Laval Iran Co. Ltd.	Iran
Alfa-Laval AG	Switzerland	Alfa-Laval (Ireland) Ltd.	Republic of Ireland
Alfa-Laval Ab, Oy	Finland	Alfa-Laval K.K.	Japan
Alfa-Laval Agri Ges. m.b.H.	Austria	Alfa-Laval Service K.K.	Japan
Alfa-Laval Agri Scandinavia AB	Finland	Alfa-Laval Korea Ltd.	South Korea
Alfa-Laval Agri Scandinavia A/S	Norway	Alfa-Laval Liceis AB	
Alfa-Laval Agri Scandinavia Ab, Oy	Finland	Alfa Laval Livsmedelsteknik Norden AB	
Alfa-Laval Agri S.r.l.	Italy	Alfa-Laval Ltd.	Kenya
Alfa-Laval Agriculture International AB		Alfa-Laval Ltd.	Canada
Alfa-Laval Australia Pty. Ltd.	Australia	Windelerer Controls Ltd.	Canada
Alfa-Laval Agri Pty. Ltd.	Australia	Alfa-Laval (Malaysia) Sdn. Bhd.	Malaysia
Manus Nu-Pulse Pty. Ltd.	Australia	Alfa-Laval Marine & Power Engineering AB	
Alfa-Laval Engineering Pty. Ltd.	Australia	Alfa-Laval Marine & Power (S) Pte. Ltd.	Singapore
Alfa-Laval Hamilton Pty. Ltd.	Australia	Alfa-Laval Materials AB	
Bioquip Australia Pty. Ltd. (A)	Australia	Alfa Laval Mejeri A/S	Denmark
Bran + Luebbe Pty. Ltd.	Australia	Alfa-Laval Middle East AB.	
Control Instrumentation Pty. Ltd.	Australia	Alfa-Laval N.V.	Netherlands
Heat Transfer Pty. Ltd.	Australia	Alfa-Laval Agri B.V.	Netherlands
Alfa-Laval Biotechnology AB		Alfa-Laval Industrie B.V.	Netherlands
Alfa-Laval Caribbean Ltd.	Jamaica	Alfa-Laval Vastgoed B.V.	Netherlands
Alfa-Laval Centritech AB		Alfa-Laval N.V., S.A.	Belgium
Alfa-Laval (China) Ltd.	China	Alfa-Laval Chemicals N.V.	Belgium
Alfa-Laval et Cie. S.A. (SORENEV)	France	Alfa-Laval (N.Z.) Ltd.	New Zealand
Alfa-Laval Co. Ltd.	U.K.	Alfa-Laval (Nigeria) Ltd. (A)	Nigeria
Alfa Laval Agri Ltd.	U.K.	Alfa-Laval Oil & Gas A/S	Norway
C & M Dairy Supplies Ltd.	U.K.	Alfa-Laval Overseas AB	
Dairy Care Ltd.	U.K.	Alfa-Laval Pakistan AB	
Dairy Services (Lancs) Ltd. (d)	U.K.	Alfa-Laval Portugal Ltd.	Portugal
Dairy Supplies (Hereford) Ltd.	U.K.	Alfa Laval (Pte.) Ltd.	Zimbabwe
Wessex Milker Services Ltd. (d)	U.K.	Alfa-Laval Quality Management AB	
Alfa-Laval Cheese Systems Ltd.	U.K.	Alfa-Laval Raco Inc. (A)	Philippines
Alfa-Laval Contracting & Trading Ltd. (d)	U.K.	Alfa-Laval Re (Luxemburg) S.A.	Luxembourg
Alfa Laval Engineering Ltd.	U.K.	Alfa-Laval S.A.	France
Alfa-Laval Agencies Ltd. (d)	U.K.	Agri Bretagne S.A.	France
British Separators Ltd. (d)	U.K.	Alfa-Laval Elvage S.N.C.	France
Zeta Engineering Ltd. (d)	U.K.	Alfa-Laval Export S.N.C.	France
Alfa-Laval Finance Co. Ltd.	U.K.	Alfa-Laval Industrie S.N.C.	France
Alfa-Laval Flow Equipment Ltd.	U.K.	Diabolo Manus S.A.	France
Alfa-Laval Sharples Ltd.	U.K.	Jean Pages et Fils S.A.	France
Ibex Engineering Co. Ltd.	U.K.	Sharples Stokes S.A.	France
Infer-Personnel & Administration Co. Ltd. (A)	U.K.	Alfa-Laval S.A.	Peru
International Agricultural Development Co. (U.K.) Ltd. (d)	U.K.	Alfa-Laval S.A.	Argentina
PDP Pumps Ltd.	U.K.	Alfa-Laval S.A.	Spain
SattControl UK Ltd.	U.K.	Manus Agro-Iberica S.A.	Spain
Saunders Valve Co. Ltd.	U.K.	Torraval S.A.	Spain
Saunders Valve Australia Pty. Ltd.	Australia	Alfa-Laval S.A.C.I.	Chile
Saunders Valve Inc.	U.S.A.	Alfa-Laval S.A. de C.V.	Mexico
Alfa-Laval de Colombia S.A.	Colombia	Sharples-Stokes S.A. de C.V.	Mexico
Alfa-Laval Contracting AB		Alfa-Laval SANICA (A)	Venezuela
Alfa-Laval Contracting Ltd.	U.K.	Alfa-Laval S.p.A.	Italy
Alfa-Laval Contracting and Trading AG	Switzerland	Alfa-Laval Separation AB	
Alfa-Laval Credit AB		Alfa-Laval Service Partner AB	
Alfa-Laval (East Asia) Ltd.	Hong Kong	Alfa-Laval South East Asia Pte. Ltd.	Singapore
Alfa-Laval Energy & Cooling Systems AB		Alfa-Laval (Thailand) Ltd. (A)	Thailand
Alfa-Laval Equipamentos Ltda.	Brazil	Helmsford Pte. Ltd.	Singapore
Sharples Stoke S.A.	Brazil	Bahagia Ukor Sdn. Bhd. (A)	Malaysia
Alfa-Laval Flow Equipment AB		Haven Automation Guangzhou (JV) Co. Ltd. (A)	China
Alfa-Laval Fondforvaltning AB		Haven Automation (Hong Kong) Ltd.	Hong Kong
Alfa-Laval Food & Dairy International AB		Haven Automation International Ltd.	Hong Kong
Alfa-Laval Food Engineering AB		Haven Automation (Singapore) Ltd.	Singapore
Alfa-Laval Food Engineering GmbH	West Germany	Milford Haven Automation (Malaysia) Sdn. Bhd.	Malaysia
Alfa-Laval Food Systems AB		Milford Haven Engineering (Malaysia) Sdn. Bhd.	Malaysia
Alfa-Laval Grundstücksobjekt "Zentrallager Glinde" GmbH & Co. Verwaltungs-KG	West Germany	SEA Automation Services (Singapore) Pte. Ltd.	Singapore
Alfa-Laval Hamra Gård AB		Usahasama Bahagia Haven Sdn. Bhd. (A)	Malaysia
Alfa-Laval Hellas S.A.	Greece	Alfa-Laval Stainless Products AB	
Alfa-Laval Holding GmbH <sup>1</sup>	West Germany	Alfa-Laval Technical Engineering & Consulting AB	
Alfa-Laval (Hong Kong) Ltd.	Hong Kong	Alfa-Laval Technology AB	
Alfa-Laval Inc.	U.S.A.	Alfa-Laval Thermal AB	
Alfa-Laval Agri Inc.	U.S.A.	Alfa-Laval Treasury AB	
Alfa-Laval Leasing Corp.	U.S.A.	Alfa-Laval Unimex AB	
Celleco Inc.	U.S.A.	Alfa-Laval Venezolana S.A.	Venezuela
G & H Inc.	U.S.A.	Alfa-Laval Verwaltungs- und Beratungs-GmbH	West Germany
West Agro Inc.	U.S.A.	Alfa-Star AB (A)	
West Agro Ltd.	Canada	Alfinad S.A.	Belgium
Alfa-Laval India Ltd. (A)	India	Alekulla AB	
Alfa-Laval Industriegesellschaft AG	Switzerland	Autosort AB (A)	
Alfa-Laval Industriechnik GmbH	West Germany	BMD Foundry Machinery Ltd. (A)	India
Alfa-Laval Wärmetechnik GmbH	West Germany	Bran + Luebbe Analyzing Technologies Inc.	U.S.A.
Atmos Lebensmitteltechnik GmbH	West Germany	Bran + Luebbe K.K.	Japan
Alfa-Laval Trading GmbH	West Germany	Byggnadsfirma Strömsholmen i Norrköping AB	
Bran + Luebbe GmbH	West Germany	CPM AG	Switzerland

CTC Ronneby AB			
CTC Wärmetauscher GmbH	West Germany		
Cashin Systems Corp.	U.S.A.		
Celleco AB			
Celleco Ltd.			
Centrifugas Peruanas S.A.	Canada		
Chemap AG	Peru		
Biolink K.K.	Switzerland		
	Japan		
Alfa-Laval AB <i>contd.</i>			
Chemap AG <i>contd.</i>			
Chemap GmbH	West Germany		
Chemap Inc.	U.S.A.		
Chemap Ltd.	U.K.		
Chemap S.A.R.L.	France		
Chérifienne Alfa-Laval, Sté. (A)	Morocco		
Comeureg S.A. (A)	France		
Control Development SPI AB (A)			
Corral S.A.	France		
Dansk Alfa-Laval Holding A/S	Denmark		
Alfa-Laval Agri Scandinavia A/S	Denmark		
Alfa-Laval Finans Management A/S	Denmark		
Alfa-Laval Fish & Meat Engineering A/S	Denmark		
Alfa-Laval Separation A/S	Denmark		
Alfa-Laval Zeta A/S	Denmark		
Danish Membrane Filtration & International Dairy Engineering A/S	Denmark		
O.G. Höyer A/S	Denmark		
Danice Services A/S	Denmark		
O.G. Höyer Inc.	U.S.A.		
Lavrids Knudsen Maskinfabrik A/S	Denmark		
Manus Agroteknik A/S	Denmark		
Nirex Engineering A/S	Denmark		
De Laval Ljungström Pump AB			
El-Fi Innovationer AB (A)			
Epitac AB (A)			
Equipos Agrícolas S.A.	Spain		
Euroheat AB			
FAUCI S.r.l. (A)	Italy		
Fabriken Odin AB			
Finska Separator Ab	Finland		
Flavoring AB (A)			
Foga Försäljnings AB			
Formax Inc.	U.S.A.		
Four Seasons Venture Capital AB (A)			
GEFFROI S.A. (A)	France		
Grapendal Ingenjörsbyrå AB			
Haluwrap A/S (A)	Denmark		
Hamra Industrifastigheter HB (A)			
Hamra Invest AB			
Indo-Laval P.T. (A)	Indonesia		
International Marine Engineering Co. Ltd.	Hong Kong		
Johnson & Loft Inc.	U.S.A.		
Khartoum Dairy Products Co. Ltd. (A)	Sudan		
Klåvbens AB (A)			
Koltek Oy	Finland		
Koppens Holding B.V.	Netherlands		
Koppens International B.V.	Netherlands		
Koppens Food Machinery A/S	Norway		
Koppens Food Machinery Ltd.	U.K.		
Koppens Machinefabriek B.V.	Netherlands		
Koppens Onroerend Goed B.V.	Netherlands		
Koppens Holding Inc.	U.S.A.		
Koppens Industries Inc.	U.S.A.		
Kurose Chemical Equipment Co. Ltd. (A)	Japan		
T.W. Kutter Inc.	U.S.A.		
Kvarnby Verkstads AB			
Kyoto Machinery Co. Ltd. (A)	Japan		
LKM Industrial Flow Equipment B.V.	Netherlands		
Labora AB			
Ladish Co. of Canada Ltd.	Canada		
Lindova AB (A)			
Lingbo Verkstäder AB			
MAS Dairies Ltd. (A)	Pakistan		
MGI Inc.	U.S.A.		
MPL Dosiertechnik GmbH	West Germany		
Manus AB			
Manus (Great Britain) Ltd.	U.K.		
Midi Pyrenées Elevage S.N.C.	France		
Modulex Ab	Finland		
Natur- och Miljövars- teknik NMT AB (A)			
Nordinvest Ab, Oy	Finland		
Norsk Alfa-Laval Holding A/S	Norway		
Norsk Separator A/S	Norway		
Olofströms Energiservice AB			
Olofströms Kraft AB			
Parca Norrahammar Ab, Oy	Finland		
Pelzer GmbH	West Germany		
Pennwalt Equipment Italiana S.p.A.	Italy		
Pennwalt, S.A.I.C. y F.	Argentina		
Procla AB nr. 5			
Profila AB			
Prosemoc S.A. (A)	France		
Raco-Haven Automation (Philippines) Inc. (A)	Philippines		
Reginox Indústria Mecânica Ltda.	Brazil		
		Rema Electronics Inc.	U.S.A.
		Rydeco Handels- och Förvaltnings AB (A)	U.S.A.
		Safeset Inc. (A)	U.S.A.
		N.J. Sahlströms Maskin AB	
		SattControl AB	
		SattControl A/S	Denmark
		SattControl A/S	Norway
		SattControl GmbH	West Germany
		SattControl (India) Ltd. (A)	India
		SattControl Oy	Finland
		SattControl S.A.	France
		SattControl AG	Switzerland
		SattControl Benelux B.V.	Netherlands
		SattControl Inc.	U.S.A.
		SattControl Instruments AB	
		SattControl Rema AB	Norway
		SattControl Rema A/S	Finland
		SattControl Rema Ab, Oy	Italy
		SattControl S.r.l.	West Germany
		Saunders-Armaturen GmbH	
		Separator, AB	
		Sharples Inc.	U.S.A.
		Sharples Stokes Pty. Ltd.	Australia
		Sparmanfabriken AB	
		Square Co. AB	
		Stanex Heater AB	
		Straight Line AB	
		Sukab Finans, AB (A)	
		Sukab Intertrade GmbH (A)	Austria
		Svenska Rotor Maskiner AB	
		Metalform Safeset AB	
		Nacka Patentbyrå, AB (d)	
		Oktan AB	
		Systems Silkeborg A/S (A)	Denmark
		T.H.O.R. Process KB	
		T.H.O.R. Process Sweden AB	
		TL-Konsult AB (A)	
		Tagland (N.Z.) Ltd. (A)	New Zealand
		Tebel Machinefabriken B.V.	Netherlands
		Tecnica Agro-Industrial S.A. de C.V. (A)	Mexico
		Titan-Copenhagen S.A.	France
		Tomal AB	
		Tomal GmbH	West Germany
		Tomoe Saunders Ltd. (A)	U.K.
		Tri-Clover Inc.	U.S.A.
		Unimex AB	
		Universal Dairy Equipment Inc.	U.S.A.
		Upthorpe Computer Programs Ltd.	U.K.
		Vendona Beteiligungs- & Finanzierungs AG	Switzerland
		WIAL Communication AB (A)	
		Withers Farm Machine Ltd.	New Zealand
		Zander & Ingeström AB	
		Maskin AB Zeta (d)	
		Maskin A/S Zeta	Norway
		Zander & Ingeström Service AB	
		Zeta Vann og Avløp A/S	Norway

<sup>1</sup> See separate entry West Germany

**Appendix II. Principal companies and locations of Tetra Pak AB.**

Name of the company	Location	Production	No. of workers
<u>Europe.</u>			
Tetra Pak International AB	Lund, Sweden.	Operational group headquarters.	
Tetra Pak AB	Lund, Sweden.	(?)	2430 (1989)
Tetra Pak Innova.	Lomma, Sweden.	Research and development.	
Tetra Pak AB	Sunne, Sweden.	Packaging materials.	
Tetra Pak AB	Tomelilla, Sweden.	Packaging materials.	
Tetra Pak A.S.	Skoeyen/Oslo, Norway.	(?)	35 (1988)
Tetra Pak Oy.	Espoo, Finland.	(?)	
A/S Tetra Pak	Vallensbaekvej, Denmark.	(?)	43 (1988)
Tetra Pak Ltd.	Kingston-on-Thames, UK.	Headquarters UK.	
Tetra Pak Ltd.	Richmond, UK.	(?)	159 (1988)
Tetra Pak Ltd.	Wrexham, UK.	Packaging materials.	
Tetra Pak (Ireland) Ltd.	Stillorgan, Ireland.	(?)	
Tetra Pak B.V.	Nieuwegein, Netherlands.	Headquarters Netherlands. Sales office.	35 (1987)
Tetra Pak Moerdijk B.V.	Moerdijk, Netherlands.	Packaging materials.	500 (1990)
Tetra Pak Deutschland	Hochheim am Main, FRG.	Packaging materials. Filling and packaging machinery. Sales office.	900 (total Germany 1989)
Tetra Pak Berlin GmbH & Co.	Berlin Heiligensee, Germany.	Packaging materials.	
Tetra Pak Produktions GmbH.	Limburg, Germany.	Packaging materials.	

	Darmstadt, Germany.	Research and development.	
	Stuttgart, Germany.	Research and development.	
Tetra Pak Belgium N.V.	Groot-Bijgaarden, Belgium.	Sales office.	
Tetra Pak France	Paris, France.	Headquarters France. Sales office.	500 (total France 1989)
	Dijon, France.	Packaging materials.	
	Roissy, France.	Service centre.	
	Angers, France.	Regional agency.	115 (total regional agencies 1989).
	Toulouse, France.	Regional agency.	
Tetra Pak Systems SA	Lyon, France.	Regional agency	
	Pully, (Lausanne) Switzerland.	Regional Headquarters for Europe, Middle East, Africa.	550 (Total Sw. 1989)
	Romont, Switzerland.	Packaging materials.	305
Tetra Pak AG.	Zürich, Switzerland.	Sales office. (?)	
Tetra Pak GmbH	Wiener Neudorf, Austria.	Sales office. (?)	
Tetra Pak S.A.	Madrid, Spain.	Sales office. (?)	
Tetra Pak S.A.	Arganda del Rey, Spain.	Packaging materials.	
Tetra Pak Ltda.	Carnaxide, Portugal	Packaging materials. Printing	
Tetra Pak Italiana S.p.a.	Modena, Italia.	Headquarters Italy (?)	120 (1989)
Tetra Pak Development S.p.a.	Modena, Italy.	production packaging machines.	67 (1989)
Tetra Pak Carta S.p.a.	Rubiera, Rubieri, Reggio Emilia, Italia.	Packaging materials.	228 (1989)

	Latina, Italia.	Packaging materials.	
Tetra Pak Hellas Ltd.	Athens, Greece.	Sales office. (?)	
Machine assembly plants			
<u>Canada.</u>			
Tetra Pak Inc.	Aurora, Ontario.	Packaging materials.	
<u>USA.</u>			
	9 plants.		800
Tetra Pak Inc.	Chicago, Illinois.	Headquarters Sales office (?)	70
	Sikeston, Montana.	Gable top cartons	
	Fort Wayne, Indiana.	Gable top cartons	
	Pomona, California.	Gable top cartons	
	Denisson, Texas.	Packaging materials.	
Tetra Pak Equip US	St. Pauls (2), Minnesota.	Headquarters Machines to manufacture fill and seal gable-top- ped cartons.	230
Tetra Pak MatWest	Vancouver, Washington.	Packaging materials.	115
<u>South America.</u>			
Tetra Pak S.A. de C.V.	Edo. de Mexico, Mexico.	Sales office (?)	
Tetra Pak S.A.	Panama, Panama.	Sales office (?)	
Tetra Pak Envases S.A.I.C.	Buenos Aires, Argentina.	Sales office (?)	
Tetra Pak Ltda.	Monte Mor SP, Brazil.	Sales office (?)	
Tetra Pak de Chile C.I.	Santiago, Chile.	Sales office (?)	
<u>Oceanic.</u>			
Tetra Pak Pty. Ltd.	Fairfield, New South-Wales, Australia.	(?)	

Tetra Pak Ltd.	Manukau city, Auckland, New Zealand.	(?)	
<u>Asia.</u>			
Tetra Pak AS.	Istanbul, Turkey.	Sales office (?)	
Tetra Pak (Near East) Ltd.	Nicosia, Cyprus.	(?)	
Tetra Pak (?)	Jeddah, Saudi Arabia.	Sales office (?)	
Tetra Pak, Arabian construction company.	Safat, Kuwait.	Sales office (?)	
Tetra Pak Iran	Teheran, Iran.	Sales office (?)	
Tetra pak Yemen	Sana'a, Yemen.	Sales office (?)	
Tetra Pak Pvt. Ltd.	New Delhi, India	Sales office (?)	
Tetra Pak Pakistan Ltd.	Lahore, Pakistan.	Sales office (?)	
Tetra pak China Ltd.	Hong Kong.	Sales office (?)	
Tetra Pak East Asia Ltd.	Hong Kong.	Sales office (?)	
Tetra Pak Packaging Ltd.	Taipei, Taiwan (R.O.C.)	Sales office (?)	
PT. Brikindo Jaya.	Jakarta, Indonesia.	Sales office (?)	
Tetra Pak Ltd.	Bangkok, Thailand.	Sales office (?)	
Tetra Pak Philippines Inc.	Metro Manila, Philippines.	Sales office (?)	
Nihon Tetra Pak	2 plants, Japan.	Packaging materials	950
	1 plant, Japan.	Packaging machine assembly	
Tetra Pka Pte. Ltd.	Seoul, Korea.	Sales office (?)	
Tetra Pak Pasific Pte. Ltd.	Jurong, Singapore.	Packaging materials.	
Tetra Pak Sdn Bhd.	Jalan Sultan (?), Malaysia.	Sales office. (?)	

Africa.

Tetra Pak Converters Ltd.	Nairobi, Kenya.	Packaging materials. Recycling.
Tetra pak Nigeria (division of Linkup Investment Ltd.)	Lagos, Nigeria.	Sales office (?)
(?)	South Africa.	Packaging materials.

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