

Spring 5-31-2018

Halal certification for an industrial machine intended to come in contact with food

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ABSTRACT

HALAL CERTIFICATION FOR AN INDUSTRIAL MACHINE INTENDED TO COME IN CONTACT WITH FOOD

by

Luca Caffarelli

Halal Certification is a worldwide recognition that the products are permissible under Islamic law. These products are thus edible, drinkable or usable by Muslims. It can be extended to industrial machinery and tools. This Certification must be issued by a Notified Body under the supervision of an IMAM. Focus of the Certification are GMPs and Food Contact Materials and Articles. Four main phases to achieve Certification (the scheme is the same of ISO 14001, ISO 18001 and ISO 9001):

- **Pre-Audit** - The activity is to evaluate the documentation describing our internal system.
- **Audit** – The activity is to evaluate how the Organization works in coherence with the documentation.
- **Issue of Certification** – Released by an accredited Imam.
- **System verifications** – The Certification has to be revised and confirmed every year by the Notified Body and after three years a new complete audit has to be carried out.

**HALAL CERTIFICATION FOR AN INDUSTRIAL
MACHINE INTENDED TO COME IN CONTACT WITH
FOOD**

**by
Luca Caffarelli**

**A Dissertation
Submitted to the Faculty of
New Jersey Institute of Technology
in Partial Fulfillment of the Requirements for the Degree of
Master of Science in Engineering Management**

Department of Mechanical and Industrial Engineering

May 2018

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HALAL CERTIFICATION FOR AN INDUSTRIAL MACHINE INTENDED TO COME IN CONTACT WITH FOOD

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ACKNOWLEDGMENT

I would first like to thank my thesis advisor Professor Abdel-Malek Layek of the Mechanical & Industrial Engineering Department at the New Jersey Institute of Technology and Professor Roberto Montanari of the Industrial Engineering Department at University of Parma for giving me the opportunity to join the Double Degree Program they created. I would also like to thank my Italian advisor Professor Alberto Ivo Dormio of the Industrial Engineering Department at the University of Parma, for providing me with all the necessary sources for the research and for allowing me to find a traineeship in one of the most important companies in Parma as Sidel. Moreover, I would like to thank my tutor in Sidel Massimo Porcari and all his team to support me during my six months of traineeship. I take this opportunity to express gratitude to Professor Sanchoy K. Das and all the faculty members at the New Jersey Institute of Technology for their help and support during my period stay at their university. I also thank my parents for the encouragement, support and attention. Finally, I would like to thank my friends for their support and my colleagues who shared with me this overseas experience.

TABLE OF CONTENTS

Chapter	Page
1 INTRODUCTION.....	1
1.1 Background Information	1
1.2 Research Objectives	3
1.3 Problem Statement.....	3
2 HALAL CERTIFICATION.....	5
2.1 Religious and Ethics Aspects.....	5
2.2 Halal Choice Motivation.....	7
2.3 Market Analysis Halal Products.....	10
3 COMPANY DESCRIPTION.....	15
3.1 Company History.....	15
3.2 Company Business.....	19
3.3 Sidel Group Organizational Chart.....	22
3.4 Working Team.....	26
4 REGULATIONS, DIRECTIVES, DECISIONS.....	30
4.1 Food Safety.....	30
4.2 Halal Legal Aspect	31
4.3 European Union Regulations.....	32
4.4 European Union Directives.....	33
4.5 European Union Decisions.....	35

TABLE OF CONTENTS (continued)

Chapter	Page
4.6 Certifications and Standards.....	38
4.7 EN ISO 9001.....	39
4.8 EN ISO 14001.....	41
4.9 EN ISO 22000.....	42
4.10 Codex Alimentarius.....	45
4.11 Machinery Directive.....	47
4.12 Italian Food Safety Regulation.....	49
4.13 Regulations for Halal.....	50
 5 HALAL CERTIFICATION PROCEDURE.....	 54
5.1 Notify body TUV.....	54
5.2 Halal Certification Process.....	55
5.3 Audit Steps.....	61
5.4 Pre-Audit Halal Preparation.....	62
5.5 Gap Analysis.....	63
5.6 Pre-Audit Halal.....	72
5.7 Pre-Audit Halal Conclusions.....	76
 6 HALAL CERTIFICATION RELEASE.....	 78
6.1 Audit Halal Preparation.....	78
6.1.1 Halal responsible in Sidel.....	78
6.1.2 Measurable Objectives.....	80

TABLE OF CONTENTS
(continued)

Chapter	Page
6.1.3 Customer Satisfaction.....	80
6.1.4 Internal Audits.....	86
6.1.5 Supplier Involvement.....	91
6.1.6 Management Review.....	96
6.1.7 Staff Training Program and Design and Development.....	96
6.2 Audit Halal.....	102
 7 CONCLUSIONS.....	 103
7.1 Future Research.....	105
 APPENDIX (IF ANY)	
 REFERENCES.....	 106

LIST OF TABLES

Table	Page
5.1: Pre-Audit Report.....	74
6.1: Internal Audit Report.....	89
6.2: Staff Training Program.....	97

LIST OF FIGURES

Figure	Page
3.1: Sidel Building in Parma.....	15
3.2: Sidel Technology Evolution.....	17
3.3: Super Combi.....	18
3.4: Different Activity System.....	20
3.5: Tetra Laval group.....	21
3.6: Sidel Customers.....	22
3.7: Sidel Functional Structure.....	23
3.8: Product Management and Development Organizational Chart.....	25
3.9: Working Team.....	26
4.1: Sidel Requirements.....	30
4.2: Italian Food Safety Regulation.....	50
5.1: Food Safety Flow Chart.....	69
6.1: NPS Question Example.....	81
6.2: NPS Customers Categories.....	82
6.3: CSAT Question Example.....	82
6.4: Example of Customer Satisfaction Survey.....	83
6.5: Criteria in Pre-Contracting Approach.....	84
6.6: NPS and CSAT Customers Categories.....	85

LIST OF SYMBOLS

Symbol	Page
1.1: Halal Logo.....	1
3.1: Sidel Logo.....	15

CHAPTER 1

INTRODUCTION



Symbol 1.1: Halal Logo

1.1 Background Information

In the nineteenth century Muslims awoke from a deep slumber to reassert themselves with a distinct identity. Muslim leaders took up the task of establishing the Muslim ummah as an entity. To realize this objective, they conceived the idea of creating Islamic sciences, distinct from mainstream sciences. They talked about ‘Islamic science’, ‘Islamic education’, ‘Islamic anthropology’, ‘Islamic economics’ and so on. They tried to argue that Muslims are a distinct people from other religious communities and should preserve the original and pristine version of their civilization, culture and knowledge.

The Halal Certification is a document that guarantees that products and services aimed at the Muslim population meet the requirements of Islamic law and therefore are suitable for consumption. Halal Certification is a process which ensures the features and quality of the products according to the rules established by the Islamic Council that allow the use of the mark Halal. It is mainly applied to

food products such as meat products, milk, canned food and additives. Specifically, for meat products Halal certifies that the animals were slaughtered in a single cut, thoroughly bled, and their meat have not been in contact with animals slaughtered otherwise and, especially, with pork.

The global Halal market is rising, while worldwide many standardization and certification organizations have been established. Halal food certification is a different process in order to approve the food is Halal. This process starts from at the processing of raw materials, processing of food, packaging, labelling, storing, and transportation. The complete process of production must be controlled in order to ensure the food product is Halal. A Halal Certification Organization is responsible for inspecting and monitoring food manufacturers seeking to obtain Halal Certificates. A Halal Certificate is an official document, issued by a Halal Certification Organization, which clarifies to government authorities and consumers that food producers and manufacturers are applying Halal food standards. Obtaining Halal Certificates has many advantages for food manufacturers and food premises.

In general, procedures for Halal Certification can be summed up in four stages. The first stage is formal application for certification, providing product and production details. The second stage is a review of the formal application in respect of both technical and Islamic requirements. The third stage is an audit of the premises concerned, to ensure that it complies with technical and Islamic requirements, and by taking laboratory samples, if necessary. This stage is divided in Pre-Audit phase and Audit phase. The fourth stage is the certifying of the

company by issuing a Halal Certificate valid for one to five years. There are two types of certification. The first type includes certification of the product, including the ingredients (raw materials), production processes, and the end-product or the output of the slaughter process. The second type certifies sites, slaughterhouses, food establishments, transport companies, or storage buildings having the capacity to produce, process, or transport Halal products.

1.2 Research Objective

The research objective is to achieve Halal Certification for Sidel. This certification will take to Sidel many advantages as strategic position in the global market and improvements in internal activities. Moreover, this certification will prove to have a good quality management system.

1.3 Problem Statement

The research is divided in three phases: the first phase is a description part in which there is a presentation of concepts related to Halal and Sidel company. Halal presentation is focused on ethical and religious principles and demonstrates the reason of Halal Certification choice for Sidel. Sidel description begins with a general background regarding the company history, the business area and the organizational chart. It continues with the presentation of Standards and Regulations team which is responsible to Halal Certification achievement. In the second phase there is a framing on Halal legal aspect. This means a depth study of

European regulations, directives, decisions, standards and certifications. The third and the last phase is divided in two steps: the first is the preparation to Pre-Audit and the second is the execution Pre-Audit; whereas the second is the implementation and filling the gap underlined during the Pre-Audit and the Audit to Halal Certification release.

CHAPTER 2

HALAL CERTIFICATION

2.1 Religious and Ethics Aspects

Halal Certification is a worldwide recognition that the products are permissible under Islamic law. These products are thus edible, drinkable or usable by Muslims. Halal is accepted as a quality standard applied to product supply and manufacturing. The Halal standard encompasses processed food, cosmetics, pharmaceutical and medical products. In maintaining the Halal standard, Halal suppliers or manufacturers must abide to the Halal quality regulation enforced by the public, semi-public and private regulatory bodies offering the Halal Certification.

The term Halal is a Koranic term meaning "lawful" and, with specific reference to the alimentary field, it is the term with which the correct relationship of the Muslim believer is established with nourishment. With regard to food, it is therefore definable as Halal everything that a Muslim is fully allowed to eat. The basic religious principles of food are contained in the Koran and Sunnah (the example given by the life of Prophet Muhammad), while the subsequent jurisprudence of the four juridical schools present within Sunni Islam (Hanafi school, Maliki, shafi 'ita and hanbalita) has proceeded to draw from these fundamental principles the further specifications. In fact, the juridical schools have derived from the principles of Revelation application translations capable of adapting also to new situations emerging gradually over time. It is important to underline that there are no "lists" of lawful or Halal foods in the Koran simply because the general rule is that

all good things offered by God's Providence are lawful and beneficial to man, whereas things are forbidden (haram) to constitute an exception to this rule and to be therefore explicitly indicated. According to the Koran all foods are Halal (legitimate) with the exception of those belonging to the following four categories:

- Meat of dead animals (if dead by no human action)
- Blood
- Pork meat
- Meat of animal subjected to false sacrifices

Moreover, there is a fifth prohibition on beverages and on intoxicating drinks in general. While the principles contained in the Koran and the Sunna constitute mandatory rules common to all Muslims, further indications from the four law schools may differ. Each of the different interpretative schools recognizes, however, that the different positions of the others are also orthodox. For this reason, it will be necessary to reconsider not only the basic rules of the Koran and the Sunna, but also the more detailed rules set out by the specific legal school prevailing in the geographical area of reference.

Certification is issued by a Notify Body under the supervision of an Imam. An Imam is selected at the community level. He is a respected member of the community. Members of the community choose someone who is considered knowledgeable and wise. The Imam should know and understand the Koran and be able to recite it correctly and beautifully. Imam is responsible to say if something is Halal or Haram.

Regarding the ethic aspect that Halal certified company must demonstrate in its activities, staff must be competent on the basis of an adequate level of education,

training, skills and experience. Each machinery and all equipment used in the preparation of Halal foods should be different from that used for the preparation of non-Halal foods. Hygiene, cleanliness and health rules must be observed for both the working environment and the staff, since according to Islamic tradition dirt or impurities of any kind are harmful.

2.2 Motivation Halal Choice

Halal Certification can be an added value for a company. Market is estimated about 2,300 billion US dollars and grows 6% every year. A research conducted by the Canadian government projected a global Halal market of more than 632 billion dollars annually. In addition, the Canadian domestic Halal meat market value is estimated to be \$214 million with an average annual household expenditure of \$1623. These statistics project a huge demand of Halal products that will spur the growth of the Halal industry and in turn will naturally scale up the supply for Halal certificates. Sidel conceives Halal Certification like a key to enter in new markets and consequently to improve its business. In fact, the Halal Certification requests to meet the Halal requirements from the importing countries which can help the business expands its marketplace to increase its sales and revenue. To remain competitive the efficiency of Halal Certification must be emphasized. In this context, some important potential customers, during the offer phase, have ask us if Sidel has this certification. Moreover, there are two other reasons to achieve Halal Certification for Sidel. Firstly, it's a strategic decision. If Sidel obtains this certification, it will demonstrate to have a good quality management system to its customers. In fact, Halal Certification is a light quality management system. This is useful also internally because the Halal

system adoption allows to improve internal procedures as internal audit or corrective actions. Secondly, in Italy on 18 March 2017 the Legislative Decree 29/2017 was published. The Decree came into force on 2 April 2017 and define the rules on penalties for violation of the obligations contained in different European regulations on materials and objects intended to come into contact with food, also called Food Contact Material (FCM). FCM are all materials and articles intended to come into contact with food (packings and receptacles, containers used to transport food, kitchen equipment such as dishes, glasses, film-sheets etc.), including materials used for food processing (coffee machines, meat grinders, etc.) and those in contact with drinks and water (bottles, cans, etc.), excluding public or private fixed installations for water supply. The safety of FCM is evaluated by the European Food Safety Authority (EFSA). EFSA is a European agency funded by the European Union that operates independently of the European legislative and executive institutions (Commission, Council, Parliament) and EU Member States. It was set up in 2002 following a series of food crises in the late 1990s to be a source of scientific advice and communication on risks associated with the food chain. The agency was legally established by the EU under the General Food Law - Regulation 178/2002. The General Food Law created a European food safety system in which responsibility for risk assessment (science) and for risk management (policy) are kept separate. EFSA is responsible for the former area, and also has a duty to communicate its scientific findings to the public. This authority is in Parma. The new FCM disciplinary decree sets the basis for sanctions concerning the failure to meet the requirements for the following regulations:

- Reg. (CE) 1935/2004 concerning materials and objects intended to come into contact with food products;
- Reg. (CE) 2023/2006 on good manufacturing practices of materials and objects intended to come into contact with food;
- Reg. (EC) 282/2008 on recycled plastic materials and objects intended for contact with food;
- Reg. (EC) 450/2009 concerning active and intelligent materials intended to come into contact with food;
- Reg. (EC) 10/2011 concerning plastic materials and objects intended to come into contact with food products;
- Reg. (CE) 1895/2005 on the restriction of the use of some epoxy derivatives in materials and objects intended to come into contact with food products.

The decree states that all materials and objects must be produced in compliance with the good manufacturing practices and, under normal or foreseeable conditions of use, must not transfer components to the food in quantities such as: constitute a danger to human health, lead to an unacceptable change in the composition of food products, lead to a deterioration of the organoleptic characteristics. In this context, Halal system adoption can help Sidel to respect new FCM requirements.

Why pay attention to materials-foods compatibility is important for Sidel?

- 1) Eliminate any possibilities of contamination due to the contact among foods and machine materials;
- 2) A food contamination caused excessive costs for Sidel;

- 3) Give to customer and final user a complete reliability about quality and safety of purchased products. The final consumer requires safe food; paradoxically, as disposal information about food characteristics and production processes increase, consumers are more suspicious.

So, for Sidel Halal Certification would be important to avoid bad reputation and to decrease the costs.

In order to answer to those needs many countries implemented a Legislation pointing out to: the prevention the management of unsuitable foods to human use whether they are on the market.

2.3 Market Analysis Halal Products

Marketing of products and services in the Muslim countries presents a very challenging task to multinational companies due to the difference in political, economy and socio-cultural aspects. At the same time, multinational companies could not “avoid” targeting Muslim countries as their source of expansion as these countries represent almost 20% of the World’s population. Furthermore, Muslim population is expected to increase to 30% by 2025.

The market segment for Halal products includes about 2 billion potential consumers concentrated not only in the majority Islamic countries, but also in Canada, USA, Great Britain, France. In Italy, Muslims are about 1 million, of which 10,000 Italians are converted. As Islam is the second largest religion in the world, the Halal product market is expected to grow from 45.3 billion U.S. dollars in 2016 to over 58.3 billion by 2022. The largest sector of the global Halal industry is Islamic finance with a 43 percent share of the market, followed by Halal food with a 36

percent market share. Growth in the world of the Islamic population has increased the demand for Halal food and has created new opportunities for companies that transform food products. Some of the most important companies in the food sector, including Nestlè (snacks, breakfast cereals, dessert yogurt), Baskin Robbins (ice cream, desserts, ice cream cakes) and Campbell Soup (a vegetarian restaurant supplier), have dedicated products to this segment of consumers who follow the Koran rules on nutrition. For example, in Malaysia, standards for Halal Certification have been drawn up, the Halal Certification issued by recognized certification agencies is essential for distributing food products in Malaysia. In various countries of the World, very interesting market surveys have been conducted to plan possible actions. In Great Britain for instance Halal marketing is taking on a certain importance. The English market has experienced a real Halal emergency that has not only involved the food sector, but many other sectors: cosmetics, pharmaceuticals, medicines, biotechnology, travel and tourism, banking and finance, insurance, packaging, storage, maritime transport, advertising, branding, clothing and fashion and many other categories that link to the concept of Halal. The Halal product does not only feed the small shops, restaurants, butchers, distributors and importers serving the Muslim communities. Today this sector is important for large shopping centers, for supermarket chains and large retailers. Moreover, these products are used in university and school canteens, public institutions and hospitals. Malaysian suppliers operating in the Halal sector are very aggressive and are very interested in the English market. However, access to this market is limited by regulations that establish the list of countries from which slaughtered meat comes. Regarding Halal

products, the label, the brand and the packaging for the Muslim consumer become crucial.

Another important example is Canada. Alberta Agriculture, Food & Rural Development (AAFRD) and Farming for The Future Farm Demo Project (FFF) funded the Canadian Halal Meat Market: An Alternative Market for Alberta's Meat Industry. The objective of the project is to qualify and quantify the market opportunities for Alberta meat producers and processors to supply Halal meat within Canada. The information contained in this report was obtained from both primary and secondary research. The primary research entailed the development and implementation of a written consumer survey targeting Muslim households in Toronto, Ottawa, Vancouver, Calgary and Edmonton. Secondary research entailed data gathering from trade magazines, business and government sources. The Canadian domestic Halal meat market value is estimated to be \$214 million with an average annual household expenditure of \$1623. Muslims are ardent consumers of meat and meat products, with feast days and celebrations that often include several different meat dishes. On average, Muslim households spend \$31 per week on Halal meat products. This is almost double the Canadian household meat expenditure of \$17 per week. This difference in weekly household expenditures may partially be explained by the difference in average household size. The survey respondents' average household size was 4.4 people per household whereas the Canadian Food Expenditure study's average household size is 2.5 people per household.

In response to the growing demographics of the Muslim population in Canada, the demand for Halal meat is predicted to demonstrate consistent growth rate. According to 2001 Canadian census, there are approximately 600,000 Muslims

in Canada and an estimated 8 to 11 million in the United States with a purchasing power of \$12 billion (US). The Canadian Muslim population is expected to double by the end of this decade and 30% of the world's population is expected to be Muslim by the year 2025.

The average Canadian Muslim household consumes 5.6 meat servings per day. Halal beef and chicken are the most widely consumed followed closely by lamb and goat. Out of all consumed meat cuts, ground beef ranks first at 16% followed by chicken legs (15%) then bone-in beef and whole chicken (14%). Boneless beef stands in fifth place (12%), followed closely by chicken breast (11%), then beef steak and chicken drums at 10%.

Consumers purchasing decisions are primarily influenced by their confidence that the meat is Halal. Price was the third ranked attribute to influence purchasing decisions. The majority of Canadian Muslims (74%) would pay a premium of at least \$0.50 per pound over "regular" meat. Thirteen percent seem to be willing to pay at least a premium of \$1.50 per pound for quality Halal meat. The Canadian Halal meat industry is fragmented. Approximately 15% of Canada's federally inspected cattle slaughter and 35% of calf slaughter is processed in Halal certified establishments. Alberta's largest Halal food processor, AL-NOOR Canada Inc., manufactures Halal meat and cheese. Prior to the USA export restraints associated with BSE, AL-NOOR Canada Inc., exported 95% of its total production to the USA. Beef based product was approximately 40% of its product line.

Given the speed of trade globalization, the advancement in science and technology, the continuous change in products' formulation, and the on-going initiatives to simplify manufacturing processes, it is essential that the Halal concept

be fully understood especially by the marketers of consumer goods be it for food or for non-food product categories. This is important because as the consumers become more religious or Halal conscious, they will be looking for products that not only satisfy their needs but also give them “peace of mind.” From a strategic point of view, competitiveness in the Halal industry can be achieved by tackling the issues of operational efficiency.

3 Company Description



Symbol 3.1: Sidel Logo



Figure 3.1: Sidel Building in Parma
Source: Sidel figures database

3.1 Company History

In 1961 Sidel was founded in Le Havre (France) by Georges Lesieur. The name is an acronym resulting from original French, “Société Industrielle Des Emballages Légers”. Sidel has started developing packaging technologies for PET bottles, in addition to cans and glass.

In the same year, in fact, he developed the first PVC bottle (polyvinylchloride) for the containment of edible oils and subsequently water, carbonated soft drinks, wine and milk. In 1973 the company designed and produced the first HDPE (high density polyethylene) bottle for UHT milk. In 1980 Sidel introduces the world's first SBO commercial production solution for PET beverages, with the SBO blower for carbonated soft drinks, with output at 3,600 bottles per hour. Several years later, in 1998, Sidel introduced into the market a system that was able to combine a bottle blowing, filling and capping module allowing its customers to increase production efficiency and reduce the total cost of property (TCO). In that year the first sterilization system of preforms and stoppers was created using hydrogen peroxide (hydrogen peroxide).

Today, Sidel is able to operate on the entire filling process for food liquids providing solutions in its own right or in line also with aseptic packaging; these latest technologies include sterilization treatments in both "wet" bottles with peracetic acid and "dry" preforms with hydrogen peroxide. The company also produces pasteurizers, bottle washers and labeling machines, as well as end-of-line modules such as palletizers and robotic manipulators for handling finished and packaged products. Another field of activity of the company is the design and industrialization of PET bottles. In addition to the development of different shapes, weights and dimensions, this technology includes the construction of molding plants flexible that allow to obtain containers having optimal characteristics according to the specifications required by the different customers and able to be sustainable and at the same time ideal to face the challenges proposed by the supply chain up to the

final consumer. In the last years, Sidel has given great importance to COMBI, that is the coupling of the two main machines, blow molding and filling machines.



Figure 3.2: Sidel Technology Evolution
Source: Sidel figures database

What has been requested by the market for twenty years is the complete solution. Not just lines composed of machines, but also complete solutions. Indeed, before and after the sale of the line, the company offers optimal packaging, engineering and customized line layouts, installation project management activities, as well as service solutions designed to maintain or even increase performance over time.

In 2017, the Sidel Group launched Super Combi, integrating five process stations (preform, blowing, labelling, filling and capping) into a single system for optimized carbonated soft drinks and water production. In the same year, the Sidel

Group introduced its Agility 4.0 program to provide customers with the “Factory of the Future” through smart technologies. The potential of agility 4.0 is expressed by:

- Up to 30% cut in production time
- Allow mass customization of nearly all products
- Boost manufacturing efficiency by 25%
- 10-20% cost savings due to improved quality processes and troubleshooting

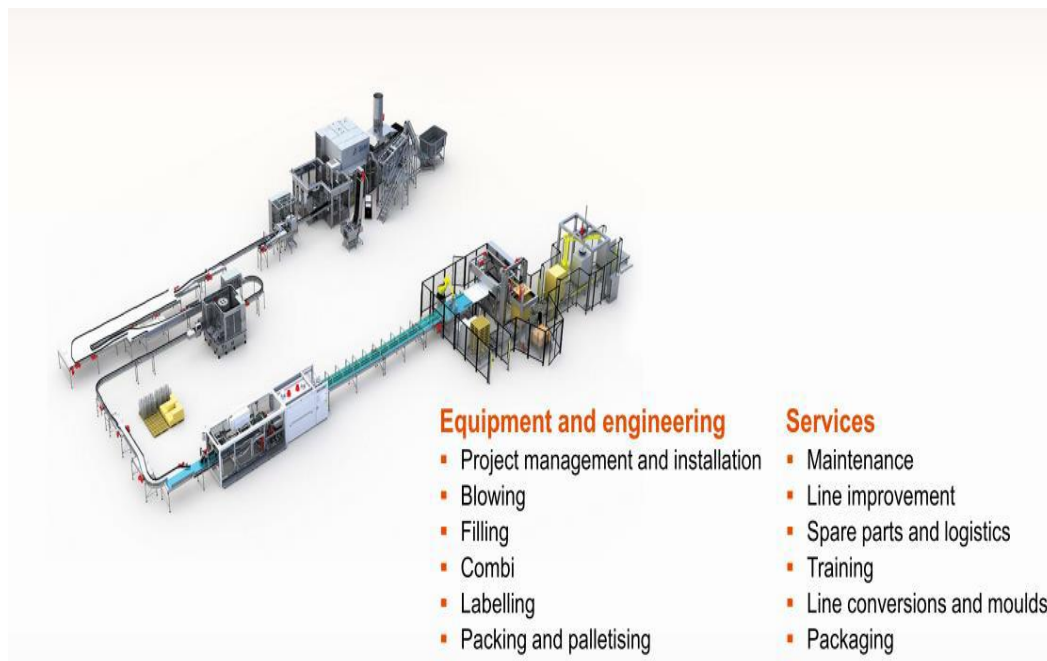


Figure 3.3: Super Combi
Source: Sidel figures database

The Sidel Group, including Gebo and Cermex, joins the Tetra Laval Group, becoming one of its three main industrial groups alongside Tetra Pak and De Laval. Simonazzi joins the Tetra Laval Group to provide complete liquid-packaging solutions for the beverage industry. The newly expanded Sidel launches its third-generation of blowers, the SBO Universal, capable of producing 1,800 bottles per

hour per mould. Simonazzi Workshops is founded in Parma in 1850, Italy by Pompeo Simonazzi, who sees an opportunity to offer mechanical equipment to local farmers. In the following years, Simonazzi extends its capabilities to filling and bottling of beverages.

Listed on the stock exchange in France, Sidel has 13 production sites. Those of Parma, which has recently become the headquarters of the company, specialized in the production of fillers, process machines (mixers and cip units) and palletizers, and Octeville (France), specialized in the production of blowers, they are the most important Sidel sites in the world. The third site, by order of importance, is Beijing (China). On the Italian territory, Sidel is also present with a site in Mantua, a center of excellence for what concerns the labeler (labeling machines).

3.2 Company activities

Sidel Group is a company operating worldwide in the food industry and especially in the food packaging sector. In fact, there are numerous types of food products on which the company can boast considerable experience as well as complete bottling lines solutions, such as for mineral water, carbonated soft drinks, sensitive drinks such as nectars, fruit juices, milk, tea, energizing drinks, as well as for food oil, beer and wine, looking for the optimal solution for each beverage.

Over the years, the Sidel Group has gained a high level of engineering and plant engineering expertise in filling technologies in PET containers, cans or glass bottles, such as aluminum and stainless steel; for most of these materials it is able to provide its customers with complete technological solutions that include machines for the production of the containers themselves (such as blowers for PET

bottles of different sizes), or capping machines, labelling machines, handling systems and packaging systems.



Figure 3.4: Different Activity Systems

Source: Sidel figures database

Nowadays, Parma is the center of excellence for product development and filling machines with over 140 years of history, with over 800 employees.

To quote some numbers:

- 1.4 bln turnover;
- More than 30,000 machines installed;
- More than 5000 employees;
- 8 research centers;
- 21,600 molds produced in 2015 that enter the blowing machines to give shape to the bottles.

38% of Sidel employees have more than 20 years of seniority, but the average age is relatively low (45 years with 16 years of seniority in the company). 34% of employees were born as Sidel and 42% of managers were born as Sidel managers.

Over 30% of employees have a university degree. 4% of employees are not Italian, number destined to increase. The goal is to give value to the beverage industries, offering customers sustainable and reliable solutions over time.



Figure 3.5: Tetra Laval group
Source: Sidel figures database

All the different categories of drinks follow:

- Water;
- Carbonated Soft Drinks (CSD);
- Juices, Nectars, Soft Drinks, Isotonics, Teas (JNSDIT);
- Milk and Liquid Dairy Products;
- Beer, Wine and Spirits.

Then some of the Sidel customers who are among the leaders of the beverage business:

- Brand owners;
- Co-packers;

- Plastic converters

CSD	     
WATER	       
JUICE & TEA	        
BEER	       
DAIRY	        
CONVERTERS	     
WINE & SPIRITS	   
CO-PACKERS	 
OTHER	   

Figure 3.6: Sidel Customers
Source: Sidel figures database

3.3 Sidel Group organization chart

Sidel is a company organized in according to a functional structure, that is a hierarchical organizational model in which people are grouped by area of specialization and supervised by a functional manager.

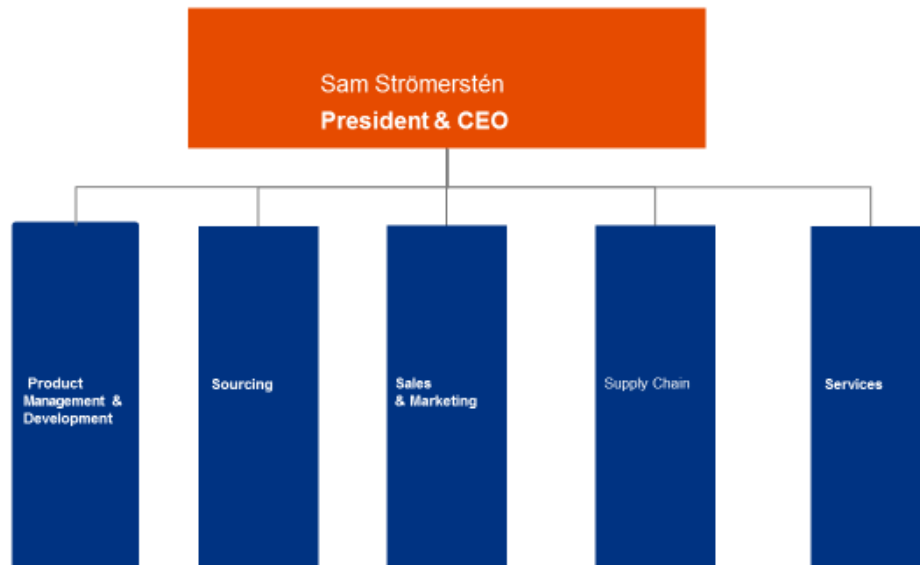


Figure 3.7: Sidel Functional Structure
Source: Sidel figures database

The main purposes of the principal functions are:

- The goal of Product Management and Development is to ensure a long-term profitable and reliable product portfolio of equipment and complete lines, based on a modular and standardized architecture, which meets the needs of the market and creates value for our customers and Sidel;
- The goal of Sourcing is to define and implement Sidel's sourcing strategy over the short, medium and long term, to improve quality, delivery, cost and asset management. The function's overall objective is to ensure economical and timely quality sourcing of raw materials, components, parts, modules, equipment and services that we require globally. Sidel is committed to fully making use of its

collective buying power on a global basis, by moving our sourcing approach from components to modules;

- The purpose of Sales and Marketing is to bring more focus to effective customer management. It will maximize sales and profitability of our complete lines, equipment and services through value selling techniques and driving enhanced customer service. In partnership with the Product Management and Development function, it will also deliver the customer voice to the company's research and development strategy;
- Supply Chain is accountable for executing all equipment and complete line customer orders, from order intake to final customer acceptance. It partners with the Services function to ensure end-to-end execution of services orders also;
- The goals of the Services function are to develop Sidel's services strategy, product offering and excellence in execution to grow the services business and its profitability in a sustainable way. In doing so it co-ordinates services activities and works especially closely with the Product Management and Development, Supply Chain and Sales and Marketing functions.

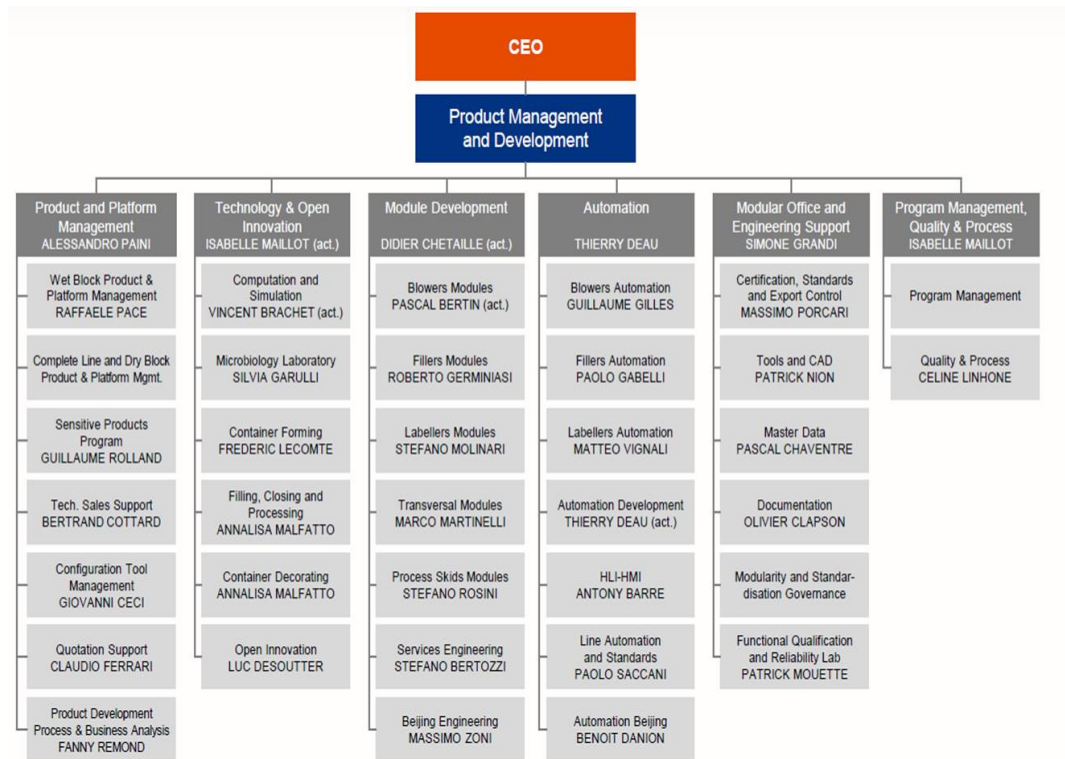


Figure 3.8: Product Management and Development Organizational Chart

Source: Sidel figures database

In my internship I worked in Modular Office and Engineering Support. This team takes part of Product Management and Development. Modular Office and Engineering Support acts as a key driver of projects and initiatives to optimize Sidel's modular and standardized global product architecture; identify opportunities to decrease product costs; and secure governance for a consistent engineering approach for platform evolutions, and new product and module development. This team also defines the technical tools and standards for engineering quality excellence; analyzes engineering business needs; and scouts and validates engineering tools, processes and solutions. The team drives the methodology (such as Six Sigma) and related tools to qualify new modules and new platforms (for both functionality and reliability) and reduce testing costs and time-to-qualification. The team also develops

relations with external partners (such as universities and scientific institutions) to ensure Sidel can take advantage of the very latest engineering trends. This team is also the home of compliance with legal engineering requirements (local and global). This includes managing related company standards, and monitoring and scouting updates in related laws and international standards. This also includes securing technical master data and documentation systems, securing company-wide alignment on processes, procedures and tools.

3.4 Working team

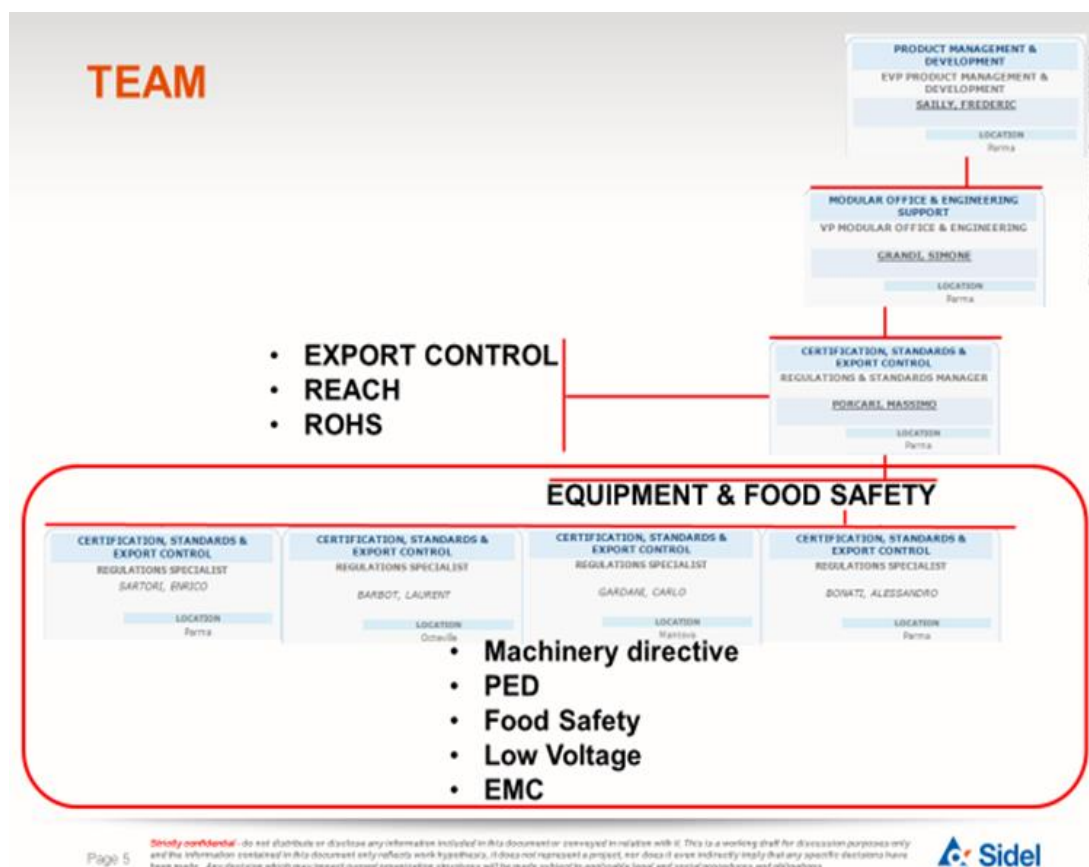


Figure 3.9: Working Team
Source: Sidel figures database

I was in Certification, Standard and Export Control area under the supervision of Massimo Porcari. During my internship I followed the project “Halal”, in addition I reworked entire Global Management System of equipment and food safety area. Basically, the GMS is an online reference for the processes Sidel employers need in their work (activity diagrams, accountability matrix, standard contracts, templates, work instructions and so on). The GMS is also the single repository for all Sidel policies, procedures and guidelines. It is important to demonstrate employers are consistent in their job. With the GMS, it’s easy to stay up-to-date and contribute to giving Sidel customers the best service and creating the highest levels of customer satisfaction.

Equipment and food safety GMS is composed by several processes: Assess Design Conformity, Assess Execution Conformity, Assess Putting into service Conformity, Support Equipment Safety, Support Food Safety, Assess of Delivery of Deliverables for customers. In these processes there are the different actions, responsibilities, roles for each company functions, among which Certification, Standard and Export Control.

The team is responsible for compliance (Export Control, REACH, ROHS). There is a complicated network of agencies and inter-related regulations that govern exports collectively referred to as Export Control. In brief, Export Control regulate the shipment or transfer, by whatever means, of controlled items, software, technology, or services out of Italy. Whereas REACH is a regulation of the European Union, adopted to improve the protection of human health and the environment from the risks that can be posed by chemicals, while enhancing the competitiveness of the EU chemicals industry. It also promotes alternative methods

for the hazard assessment of substances in order to reduce the number of tests on animals. At last, RoHS is the acronym for Restriction of Hazardous Substances. RoHS, also known as Directive 2002/95/EC, originated in the European Union and restricts the use of specific hazardous materials found in electrical and electronic products. Moreover, the team is responsible for equipment and food safety (machinery directive, PED, food safety, low voltage, EMC).

The Machinery Directive (Directive 2006/42 / EC) is a Directive of the European Parliament and of the Council which establishes the health and safety requirements that must respect the machines. The Pressure Equipment Directive (PED) 2014/68/EC of the EU sets out the standards for the design and fabrication of pressure equipment ("pressure equipment" means steam boilers, pressure vessels, piping, safety valves and other components and assemblies subject to pressure loading) generally over one liter in volume and having a maximum pressure more than 0.5 bar gauge. It also sets the administrative procedures requirements for the "conformity assessment" of pressure equipment, for the free placing on the European market without local legislative barriers. Regarding Food Safety, the EU's food safety policy covers food from farm to fork. The Low Voltage Directive (LVD) (2014/35/EU) ensures that electrical equipment within certain voltage limits provides a high level of protection for European citizens, and benefits fully from the Single Market. The Electromagnetic Compatibility (EMC) Directive 2014/30/EU ensures that electrical and electronic equipment does not generate, or is not affected by, electromagnetic disturbance. The EMC Directive limits electromagnetic emissions from equipment in order to ensure that, when used as intended, such equipment does not disturb radio and telecommunication, as well as other equipment.

The Directive also governs the immunity of such equipment to interference and seeks to ensure that this equipment is not disturbed by radio emissions, when used as intended.

CHAPTER 4

REGULATIONS, DIRECTIVES, DECISIONS

4.1 Food safety

Sidel has to respect requirements of foodstuff industry and of machineries manufactures. As shown below, Sidel should be conformed to both in the respective Directives & Regulation, Standards, Guidelines.

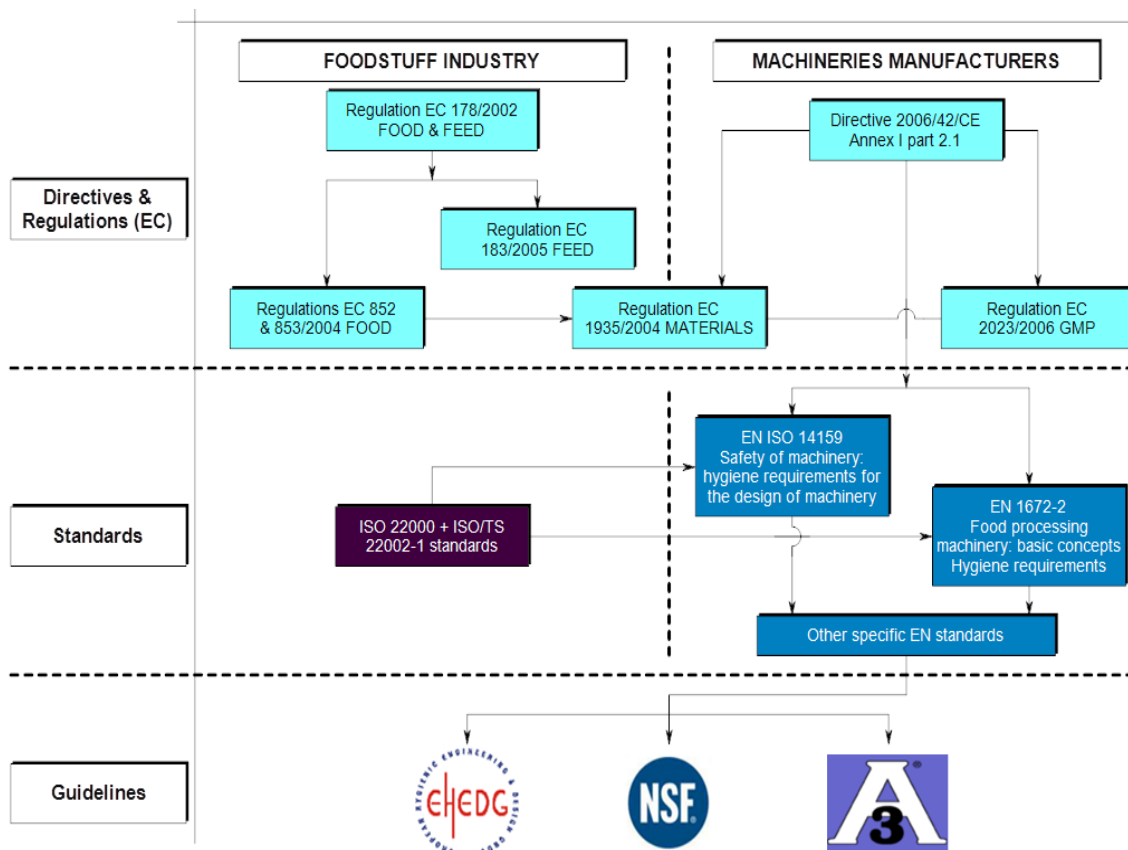


Figure 4.1: Sidel Requirements

Source: Certification, Standard and Export Control team documentation

Regarding the achieving of Halal Certification, the focus is on food safety of Sidel machines, so there are elements of foodstuff industry, but also of machineries manufacturers.

4.2 Halal Legal Aspect

As all food safety certifications, the legal aspect is essential in Halal Certification.

Legal aspect is focused on international standards and European regulations.

In particular, the reference standards are:

- EN ISO 9001: 2015 Quality management systems;
- EN ISO 14001 : 2015 Environment management systems ;
- EN ISO 22000: 2005 Food safety management systems - Requirements for any organization in the food chain;
- Codex Alimentarius;

The main regulatory references are:

- Machinery Directive;
- Regulation (EC) n. 1831/2003 of the European Parliament and of the Council;
- Commission regulation (EC) n. 1831/2003;
- Ministerial Decree of 11 June 1980 - Authorization to slaughter animals according to Jewish and Islamic religious rite.

In this context, it is useful understanding what are Regulations, Directives, Decisions and how international standards work like EN ISO 9001: 2015 or EN ISO 14001: 2015.

4.3 European Union Regulations

A "regulation" is a binding legislative act. It must be applied in its entirety and directly applicable in all European Union countries. The regulation is adopted following a legislative procedure. For example, when the EU decided to take action to protect human health and the environment against the risks associated with chemical substances, it adopted a regulation on this issue. "A regulation shall have general application. It shall be binding in its entirety and directly applicable in all Member States." The regulation forms part of the EU's secondary law. It is adopted by the European institutions on the basis of the founding treaties. It aims to ensure the uniform application of EU law in all EU countries.

The regulation is addressed to abstract categories of persons, not to identified persons. This is what distinguishes it from the decision, defined in Article 288 of the TFEU. A regulation must be complied with fully by those to whom it applies. It is a legal act binding upon:

- The EU institutions;
- EU countries;
- The individuals to whom it is addressed.

The regulation is directly applicable in all EU countries. This means that it:

- Applies immediately as the norm in all EU countries, without needing to be transposed into national law;
- Creates rights and obligations for individuals and they can therefore invoke it directly before national courts;

- Can be used as a reference by individuals in their relationship with other individuals, EU countries or EU authorities.

It is applicable in all EU countries from the date of its entry into force (a date that it sets or, failing that, 20 days after its publication in the Official Journal). Its legal effects are simultaneously, automatically and uniformly binding in all the national legislations.

4.4 European Union Directives

Article 288 states “A directive shall be binding, as to the result to be achieved, upon each Member State to which it is addressed, but shall leave to the national authorities the choice of form and methods.” A Directive is a legislative act that sets out a goal that all EU countries must achieve. However, it is up to the individual countries to devise their own laws on how to reach these goals. One example is the EU consumer rights directive, which strengthens rights for consumers across the EU, for example by eliminating hidden charges and costs on the internet, and extending the period under which consumers can withdraw from a sales contract.

The directive forms part of the EU’s secondary law. It is therefore adopted by the EU institutions in accordance with the founding Treaties. Once adopted at EU level, it is then transposed by EU countries into their internal law for application. For example, the directive on the organization of working time sets mandatory rest periods and a limit on weekly working time authorized in the EU. However, it is up to each individual country to develop its own laws to determine how to apply these rules.

Article 288 of the Treaty on the Functioning of the EU states that a directive is binding on the countries to whom it is addressed (one, several or all of them) as to the result to be achieved, while leaving national authorities competence as to form and means. However, a directive is distinct from a regulation or a decision: unlike a regulation, which is immediately applicable in EU countries' internal law immediately after its entry into force, a directive is not directly applicable in EU countries. It must first be transposed into national law before governments, businesses and individuals can have recourse to it, unlike a decision, the directive is a text with general application to all EU countries. The directive is adopted following a legislative procedure. It is a legislative act adopted by the Council and Parliament under the ordinary or special legislative procedures. For a directive to take effect at national level, EU countries must adopt a law to transpose it. This national measure must achieve the objectives set by the directive. National authorities must communicate these measures to the European Commission. EU countries have room for maneuver in this transposition process. This allows them to take into account specific national characteristics. Transposition must take place by the deadline set when the directive is adopted (generally within 2 years). When a country does not transpose a directive, the Commission may initiate infringement proceedings and bring proceedings against the country before the Court of Justice of the EU (the non-enforcement of the judgment on this occasion can lead a new conviction which may result in fines). In principle, the directive only takes effect once transposed. However, the Court of Justice of the EU considers that a directive that is not transposed can produce certain effects directly when:

- The transposition into national law has not taken place or has been done incorrectly;
- The provisions of the directive are unconditional and sufficiently clear and precise;
- The provisions of the directive give rights to individuals.

When these conditions are met, individuals may rely on the directive against an EU country in court. However, an individual may not rely on making a claim against another individual with respect to the direct effect of a directive if it has not been transposed. The Court of Justice also allows, under certain conditions, individuals the possibility of obtaining compensation for directives whose transposition is poor or delayed.

4.5 European Union Decisions

A "decision" is binding on those to whom it is addressed (e.g. an EU country or an individual company) and is directly applicable. For example, the Commission issued a decision on the EU participating in the work of various counter-terrorism organizations. The decision related to these organizations only. A decision is a binding legal act which may either be of general application or may have a specific addressee. A decision forms part of the EU's secondary law. It is adopted by the EU institutions in accordance with the founding Treaties. According to Article 288 of the Treaty on the Functioning of the EU (TFEU) a decision is binding in its entirety. Like a regulation, it cannot be applied incompletely, selectively or partially.

A decision may be a legislative or a non-legislative act. Decisions are legislative acts when they are adopted jointly by:

- The European Parliament and the Council under the ordinary legislative procedure;
- The European Parliament with the participation of the Council;
- The Council with the participation of the European Parliament under the special legislative procedure.

In other cases, decisions are non-legislative acts. They may be adopted, for example, by the European Council, the Council or the Commission. Non-legislative decisions may also take the form of delegated and implementing acts.

There are two types of decision: with a specific addressee and without specific addressee. A decision with a specific addressee may have one or more addressees (one or several EU countries, one or several companies or individuals). For example, when the Commission's decision imposed a fine on software giant Microsoft for abuse of its dominant market position, the only company directly concerned was Microsoft. A decision which specifies to whom it is addressed must be notified to the party concerned, and it takes effect upon such notification. This notification may consist of the sending of a registered letter with acknowledgement. A decision which specifies to whom it is addressed may also be published in the Official Journal of the European Union. However, the publication does not do away with the need for notification, which is the only way to ensure the act is enforceable against the addressee. Decisions addressed to one or several specific individuals and companies have direct effect (i.e. they can directly create rights and obligations for the addressees, who can invoke them and rely on them before courts). However,

decisions addressed to a specific EU country or EU countries as the addressee(s) may have a direct effect. Whether such decisions have a direct effect, depends on the nature, background and their wording. The Court of Justice of the EU recognizes only a ‘vertical’ direct effect of decisions addressed to one or several EU countries. This means that individuals may rely on a decision only against the EU country to which it is addressed (and not against another individual).

Since the entry into force of the Lisbon Treaty, a decision no longer necessarily specifies to whom it is addressed. In particular, Article 288 of the TFEU clarifies that a decision may specify to whom it is addressed, while its predecessor (Article 249 of the Treaty Establishing the European Community) referred only to a decision specifying to whom it is addressed. Decisions without specified addressees may be adopted by legislative procedures. Decisions which do not specify to whom they are addressed and which are not adopted by legislative procedures, are non-legislative acts. Such non-legislative decisions have become the basic legal act in the field of common foreign and security policy(CFSP). According to Article 25 of the Treaty on European Union (TEU), the EU shall conduct the CFSP by:

- Defining the general guidelines,
- Defining **actions** to be undertaken by the EU,
- Defining **positions** to be taken by the EU,
- Defining arrangements for the **implementation of the above actions and positions**.

For those purposes and on the basis of the TEU, the European Council and the Council adopt non-legislative decisions (Article 31(1)of the TEU). Decisions which do not specify to whom they are addressed, irrespective of whether they are

legislative or non-legislative acts, must be published in the Official Journal of the European Union. They enter into force on the date specified in them, or if no date is specified, on the 20th day after the day on which they are published.

4.6 Certifications and Standards

The provision by an independent body of written assurance (a certificate) that the product, service or system in question meets specific requirements. The standardization of a certain activity or of a product with its certification is often confused. The standard defines the requirements to be met and the certification certifies that indeed that specific activity, or that specific product, complies with the requirements of the standard. Product/service certification is a form of "direct insurance", which ensures that a product or service meets the applicable requirements.

System certification ensures the ability of an organization to structure itself and manage its own resources and processes in order to recognize and satisfy the needs of customers and the needs of the community, committing itself to continuous improvement. It is a form of "indirect insurance" and concerns in particular quality management systems (EN ISO 9001); the environment (EN ISO 14001); the food safety management (EN ISO 22000). ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). ISO is an independent, non-governmental international organization with a membership of 161 national standards bodies. Through its members, it brings together experts to share knowledge and develop voluntary,

consensus-based, market relevant International Standards that support innovation and provide solutions to global challenges.

The ISO story began in 1946 when delegates from 25 countries met at the Institute of Civil Engineers in London and decided to create a new international organization ‘to facilitate the international coordination and unification of industrial standards’. On 23 February 1947 the new organization, ISO, officially began operations. Since then, ISO has published over 22051 International Standards covering almost all aspects of technology and manufacturing. Today ISO has members from 161 countries and 778 technical committees and subcommittees to take care of standards development. More than 135 people work full time for ISO’s Central Secretariat in Geneva, Switzerland.

4.7 EN ISO 9001: 2015

ISO 9001 is a standard that sets out the requirements for a quality management system. It helps businesses and organizations to be more efficient and improve customer satisfaction. ISO 9001 is based on the idea of continual improvement. The adoption of a quality management system based on this International Standard is a strategic decision for an organization that can help to improve its overall performance and provide a sound basis for sustainable development initiatives. A quality management system is a way of defining how an organization can meet the requirements of its customers and other stakeholders affected by its work.

ISO 9001:2015 sets out the criteria for a quality management system and is the only standard in the family that can be certified to (although this is not a requirement). It can be used by any organization, large or small, regardless of its

field of activity. In fact, there are over one million companies and organizations in over 170 countries certified to ISO 9001. This standard is based on a number of quality management principles including a strong customer focus, the motivation and implication of top management, the process approach and continual improvement. Using ISO 9001:2015 helps ensure that customers get consistent, good quality products and services, which in turn brings many business benefits.

The quality management principles are:

- Customer focus
- Leadership
- Engagement of people
- Process approach
- Improvement
- Evidence-based decision making
- Relationship management

This International Standard specifies requirements for a quality management system when an organization:

1. Needs to demonstrate its ability to consistently provide products and services that meet customer and applicable statutory and regulatory requirements
2. Aims to enhance customer satisfaction through the effective application of the system

ISO 9001:2015 is designed to respond to the latest trends and be compatible with other management systems such as ISO 14001.

4.8 EN ISO 14001: 2015

The ISO 14000 family of standards provides practical tools for companies and organizations of all kinds looking to manage their environmental responsibilities. ISO 14001:2015 and its supporting standards such as ISO 14006:2011 focus on environmental systems to achieve this. The other standards in the family focus on specific approaches such as audits, communications, labelling and life cycle analysis, as well as environmental challenges such as climate change.

ISO 14001:2015 sets out the criteria for an environmental management system and can be certified to. It maps out a framework that a company or organization can follow to set up an effective environmental management system. It can be used by any organization regardless of its activity or sector. Using ISO 14001:2015 can provide assurance to company management and employees as well as external stakeholders that environmental impact is being measured and improved. There are more than 300,000 certifications to ISO 14001 in 171 countries around the world. ISO 14001:2015 specifies the requirements for an environmental management system that an organization can use to enhance its environmental performance. ISO 14001:2015 is intended for use by an organization seeking to manage its environmental responsibilities in a systematic manner that contributes to the environmental pillar of sustainability. ISO 14001:2015 helps an organization to achieve the intended outcomes of its environmental management system, which provide value for the environment, the organization itself and interested parties. Consistent with the organization's environmental policy, the intended outcomes of an environmental management system include:

- Enhancement of environmental performance;
- Fulfilment of compliance obligations;
- Achievement of environmental objectives.

ISO 14001:2015 is applicable to any organization, regardless of size, type and nature, and applies to the environmental aspects of its activities, products and services that the organization determines it can either control or influence considering a life cycle perspective. ISO 14001:2015 does not state specific environmental performance criteria. ISO 14001:2015 can be used in whole or in part to systematically improve environmental management. Claims of conformity to ISO 14001:2015, however, are not acceptable unless all its requirements are incorporated into an organization's environmental management system and fulfilled without exclusion.

4.9 EN ISO 22000: 2005

The ISO 22000 family of International Standards addresses food safety management. The consequences of unsafe food can be serious and ISO's food safety management standards help organizations identify and control food safety hazards. As many of today's food products repeatedly cross-national boundaries, International Standards are needed to ensure the safety of the global food supply chain. Food safety deals with the dangers caused by foods until the time of consumption. As the origin of dangers to food safety can take place at any stage of the food chain, proper control over the food chain is essential. ISO 22000:2005 sets out the requirements for a food safety management system and can be certified to. It maps out what an organization

needs to do to demonstrate its ability to control food safety hazards in order to ensure that food is safe. It can be used by any organization regardless of its size or position in the food chain. This International Standard specifies the requirements for a management system for food safety that combines the following key elements to ensure food safety along the food chain:

- Interactive communication;
- System management;
- Prerequisite programs (PRP);
- HACCP principles.

Communication along the food chain is essential to ensure that all relevant food safety hazards are identified and adequately controlled at each step within the food chain. This implies communication between organizations both upstream and downstream in the food chain. Communication with customers and suppliers about identified hazards and control measures will assist in clarifying customer and supplier requirements. Recognition of the organization's role and position within the food chain is essential to ensure effective interactive communication throughout the chain in order to deliver safe food products to the final consumer. The most effective food safety systems are established, operated and updated within the framework of a structured management system and incorporated into the overall management activities of the organization. This provides maximum benefit for the organization and interested parties. This International Standard has been aligned with ISO 9001 in order to enhance the compatibility of the two standards.

This International Standard can be applied independently of other management system standards. Its implementation can be aligned or integrated with existing related management system requirements, while organizations may utilize existing management system(s) to establish a food safety management system that complies with the requirements of this International Standard. This International Standard integrates the principles of the Hazard Analysis and Critical Control Point (HACCP) system and application steps developed by the Codex Alimentarius Commission. By means of auditable requirements, it combines the HACCP plan with prerequisite programs (PRPs). The organization must establish, implement and maintain active PRPs to check on: the likelihood of introducing dangers in the product through the working environment; biological, chemical and physical contamination of the product, including cross-contamination between products; levels of danger to food safety in the product and in the environment of product processing. Hazard analysis is the key to an effective food safety management system, since conducting a hazard analysis assists in organizing the knowledge required to establish an effective combination of control measures. This International Standard requires that all hazards that may be reasonably expected to occur in the food chain, including hazards that may be associated with the type of process and facilities used, are identified and assessed. Thus, it provides the means to determine and document why certain identified hazards need to be controlled by an organization and why others need not. During hazard analysis, the organization determines the strategy to be used to ensure hazard control by combining the PRP(s), operational PRP(s) and the HACCP plan.

The aim of this International Standard is to harmonize on a global level the requirements for food safety management for businesses within the food chain. It is particularly intended for application by organizations that seek a more focused, coherent and integrated food safety management system than is normally required by law. It requires an organization to meet any applicable food safety related statutory and regulatory requirements through its food safety management system.

4.10 Codex Alimentarius

The Codex Alimentarius international (food standards, guidelines and codes of practice) contributes to the safety, quality and fairness of this international food trade. Consumers can trust the safety and quality of the food products; the importers can trust that the food they ordered will be in accordance with their specifications.

The Codex Alimentarius is a collection of internationally adopted food standards and related texts presented in a uniform manner. These food standards and related texts aim at protecting consumers' health and ensuring fair practices in the food trade. The publication of the Codex Alimentarius is intended to guide and promote the elaboration and establishment of definitions and requirements for foods to assist in their harmonization and in doing so to facilitate international trade.

The Codex Alimentarius includes standards for all the principle foods, whether processed, semi-processed or raw, for distribution to the consumer. Materials for further processing into foods should be included to the extent necessary to achieve the purposes of the Codex Alimentarius as defined. The Codex Alimentarius includes provisions in respect of food hygiene, food additives, residues

of pesticides and veterinary drugs, contaminants, labeling and presentation, methods of analysis and sampling, and import and export inspection and certification. Codex standards and related texts are not a substitute for, or alternative to national legislation. Every country's laws and administrative procedures contain provisions with which it is essential to comply.

Codex standards and related texts contain requirements for food aimed at ensuring for the consumer a safe, wholesome food product free from adulteration, correctly labelled and presented. A Codex standard for any food or foods should be drawn up in accordance with the Format for Codex Commodity Standards and contain, as appropriate, the sections listed therein. General Standards, Guidelines and Codes of Practice are the core Codex texts and apply to all products and product categories. These texts typically deal with hygienic practice, labelling, additives, inspection & certification, nutrition and residues of veterinary drugs and pesticides. An important part in Codex Alimentarius is GMP (Good Manufacturing Practices). Good manufacturing practices are a set of technical principles and recommendations used in processing food products in order to guarantee that they are safe and suitable for consumption, and to prevent contamination or adulteration. Before implementing an HACCP system, it is important to have satisfactorily implemented good manufacturing practices (GMP). Prior establishment of an HCCP system can result in the identification of critical control points that should be addressed with GMP. For example, for a building the internal structure of a food processing plant, GMP will recommend that doors have a smooth and non-absorbent surface, are easy to clean and to disinfect.

The Codex Alimentarius Commission accepts that there may be minor differences in opinion in the interpretation of lawful and unlawful animals and in the slaughter act, according to the different Islamic Schools of Thought. As such, these general guidelines are subjected to the interpretation of the appropriate authorities of the importing countries. However, the certificates granted by the religious authorities of the exporting country should be accepted in principle by the importing country. Codex Alimentarius recommends:

1. Measures to be taken on the use of Halal claims in food labelling
2. Use of the term Halal and equivalent terms in claims as defined in the General Standard for the Labelling of Prepackaged Foods and include its use in trademarks, brand names and business names.

4.11 Machinery Directive

The Machinery Directive (Directive 2006/42 / EC) is a Directive of the European Parliament and of the Council which establishes the health and safety requirements that must respect the machines. This is the revised version of the Machinery Directive, the first version of which was adopted in 1989. The new Machinery Directive, which applies from 29 December 2009, has a dual purpose: to harmonize the health and safety requirements applicable to machines on basis of a high level of health and safety protection, while ensuring the free movement of machinery on the European market. The Machinery Directive 2006/42/EC does not introduce, however, radical changes compared to previous versions. Clarifies and consolidates the requirements of the directive, in order to improve its practical application and provides that the CE marking is affixed to machines complying with the essential

health and safety requirements (RES). The Machine Directive defines the concept of machine in the following way: "A set equipped or intended to be equipped with a drive system different from direct human or animal force, composed of parts or components, at least one of which mobile, connected to each other solidly for a well-determined application. "

Machinery intended for use with food or with cosmetics or pharmaceutical products must be designed and constructed in such a way as to avoid any risk of infection, sickness or contagion. The following requirements must be observed:

- (a) Materials in contact with, or intended to come into contact with, food products must satisfy the conditions set down in the relevant Directives. The machinery must be designed and constructed in such a way that these materials can be cleaned before each use;
- (b) All surfaces in contact with food products must:
 - Be smooth and have neither ridges nor crevices which could harbor organic materials;
 - Be designed and constructed in such a way as to reduce the projections, edges and recesses of assemblies to a minimum.
- (c) It must be possible for liquids, gases and aerosols deriving from food, products as well as from cleaning, disinfecting and rinsing fluids to be completely discharged from the machinery (if possible, in a 'cleaning' position);

- (d) Machinery must be designed and constructed in such a way as to prevent any substances or living creatures, in particular insects, from entering, or any organic matter from accumulating in, areas that cannot be cleaned;
- (e) Machinery must be designed and constructed in such a way that no ancillary substances hazardous to health, including the lubricants used, can come into contact with food products.

4.12 Italian Food Safety Regulations

The most important Regulations and Directives for Food Safety are shown in the figure below:

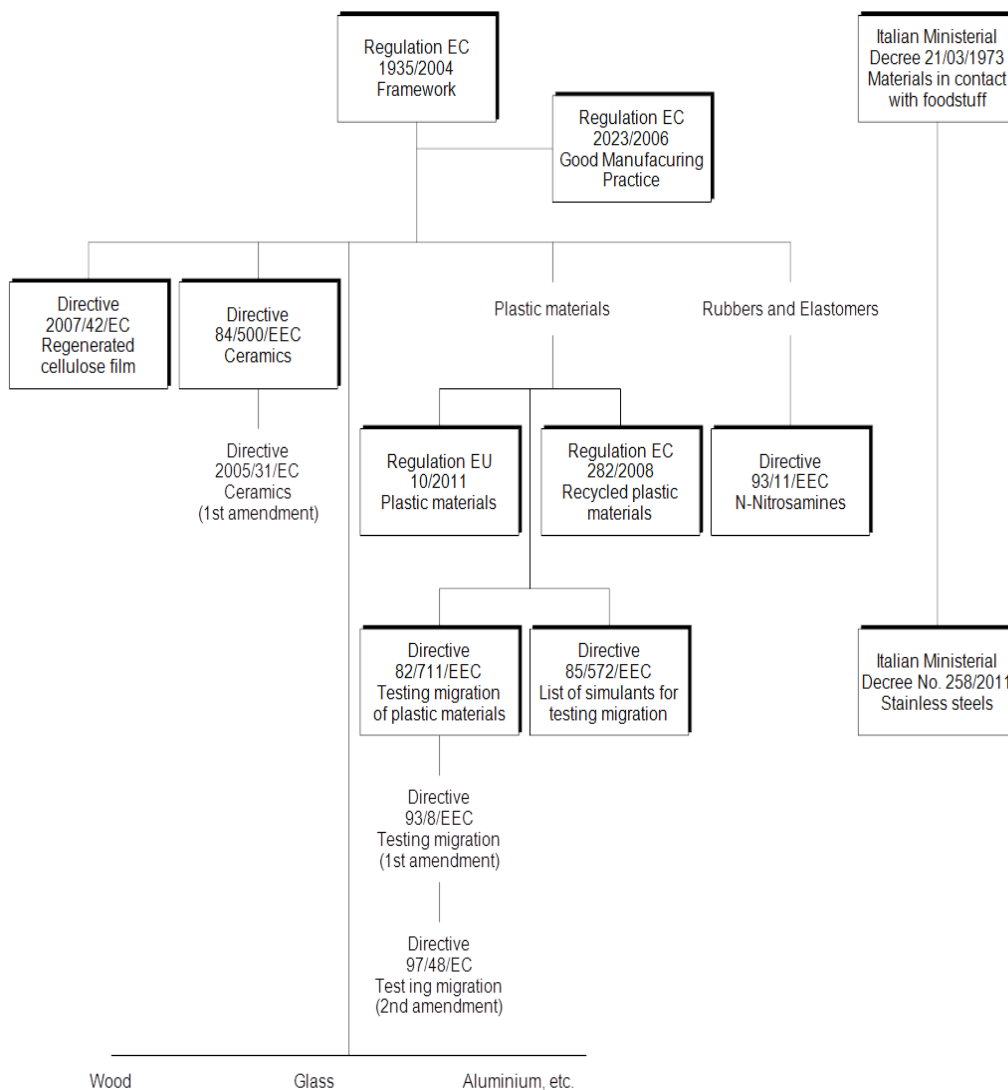


Figure 4.2: Italian Food Safety Regulations

Source: Certification, Standard and Export Control team documentation

4.13 Regulations for Halal

4.13.1 Regulation (EC) No 1935/2004

The principle underlying this Regulation is that any material or article intended to come into contact directly or indirectly with food must be sufficiently inert to preclude substances from being transferred to food in quantities large enough to endanger human health or to bring about an unacceptable change in the composition of the food or a deterioration in its organoleptic properties. This Regulation shall apply to materials and articles, including active and intelligent food contact materials and articles, (hereinafter referred to as materials and articles) which in their finished state:

- (a) Are intended to be brought into contact with food;
- (b) Are already in contact with food and were intended for that purpose;
- (c) Can reasonably be expected to be brought into contact with food or to transfer their constituents to food under normal or foreseeable conditions of use.

4.13.2 Commission regulation (EC) No 2023/2006

This Regulation lays down the rules on good manufacturing practice (GMP) for the groups of materials and articles intended to come into contact with food listed in Regulation (EC) No 1935/2004 and combinations of those materials and articles or recycled materials and articles used in those materials and articles. This Regulation shall apply to all sectors and to all stages of manufacture, processing and distribution of materials and articles, up to but excluding the production of starting substances. Good manufacturing practice (GMP) means those aspects of quality assurance which ensure that materials and articles are consistently produced and controlled to ensure

conformity with the rules applicable to them and with the quality standards appropriate to their intended use by not endangering human health or causing an unacceptable change in the composition of the food or causing a deterioration in the organoleptic characteristics thereof.

4.13.3 Ministerial Decree of 11 June 1980 - Authorization to slaughter animals according to Jewish and Islamic religious rite.

The most important articles states:

- “Slaughter without previous stunning carried out according to the Jewish and Islamic rites by the respective communities is authorized.” (Article 1);
- “Slaughter must be carried out by qualified persons having the knowledge and skill necessary to carry out the respective ritual methods.” (Article 2);
- “The operation shall be performed through a very sharp knife in such a way as to cut with one only incision the esophagus, the trachea and the neck’s big blood vessels at the same time.” (Article 2);
- “Animals shall be spared any avoidable excitement, pain or suffering during movement, breeding, restraint, stunning, slaughter or killing.” (Article 3).

During slaughter all precautions must be adopted in order to avoid as far as possible any unnecessary suffering or state of excitement. For this purpose, animals must be moved to the slaughter room only when all preparations have been completed. The preparation and jugulation of animals must be carried out immediately. Slaughter without previous stunning according to the Islamic rite may be carried out in slaughterhouses that have been authorized to export meat according to Article 7 of

the Decree of the President of the Republic no. 264 of 11 February 1961, provided that:

- 1) Slaughter shall be carried out in compliance with the provisions of Articles 2 and 3;
- 2) The owners of such slaughterhouses shall make a formal request, for the purpose of export to Islamic countries, to the Ministry of Health who, upon inspection, shall certify that the conditions required to slaughter animals according to the provisions of Articles 2 and 3 are met.

CHAPTER 5

HALAL CERTIFICATION PROCEDURE

5.1 Notify Body TÜV

Halal Certification issued by a Notify Body under the supervision of an IMAM. The Notify Body responsible for Halal Certification issue is TÜV Italia. TÜV Italia is an independent certification, inspection, testing and training body, which offers certification services in the areas of quality, energy, environment, safety and product. Since 1987 it is in Italy and belongs to the TÜV SÜD group, founded in 1866 by some Bavarian entrepreneurs and technicians who, worried about the frequent explosions involving the generators and the pressure tanks, created the Bavarian Inspection Association for the tanks pressure, today known all over the World under the name of TÜV SÜD. The structure has grown over the years and the internationalization of the business has contributed to a strong growth of activities abroad and the development of 800 offices all over the world. Present in over 60 countries for a total of over 24,000 employees, in 2016 the TÜV SÜD group had a turnover of 2,220 million euros. TÜV Italia, almost thirty years after its presence in Italy, has a structure of about 500 employees and 400 employees, with ten offices operating in Italy, which are flanked by the laboratories of Scarmagno (TO) and those of the subsidiaries Bytest, in Volpiano (TO) and Benevento, and of the pH in Tavarnelle Val di Pesa (FI), acquired respectively in January 2012 and January 2013. TÜV's goal is to satisfy a wide range of certification requests, from the system to the product one, laboratory tests, verifications, homologations, according to different national and international standards and directives. And also, to provide useful tools

to achieve sustainable development, in harmony with the environment and give work more safety and efficiency, improving the quality of life.

5.2 Halal Certification Process

The compliance of the HALAL system is verified through an Audit Program which normally includes:

- An initial certification audit conducted in two stages (document analysis and audit);
- From the second year a certification renewal audit with annual frequency.

In establishing the Audit Program are taken into consideration: the size of the organization, the scope and complexity of the HALAL system, the processes and products, the level of effectiveness of the HALAL system, the result of previous audits.

The document analysis includes the verification of the descriptive documentation of the HALAL system and the visit to the sites of the Organization.

The required documentation is as follows:

1. Evidence of payment as per accepted offer;
2. Certificate of registration with the C.C.I.A.A.;
3. Health Authorization congruent with the object of certification;
4. Self-control plan on food hygiene and safety according to the HACCP model or other;
5. Documentation certifying compliance with HALAL requirements;

6. Authorization to slaughter according to the Islamic rite according to the MINISTERIAL DECREE 11 June 1980 (only for slaughterhouses).

The objectives of this documental analysis are:

- Evaluate the suitability of HALAL system documentation in consideration of the requirements of the HALAL specification;
- Evaluate the location of the organization and the specific conditions of the sites;
- Find information on the application of the self-control plan on food hygiene and safety and compliance with it;
- Start the deepening, the analysis and the dialogue with the staff of the Organization, in order to determine the degree of application of the system;
- Assess whether internal audits and management reviews have been planned and executed effectively;
- Collect the information necessary to formulate the scope (processes and products) and the sites subject to certification;
- Review the necessary resources and agree with the Organization the details to perform the stage 2 of the audit;
- Provide clarifications on the details of the certification process.

The results, both documental and operational, resulting from the stage 1 of the audit, can be classified according to severity, such as: shortage, comment. If there are any shortcomings in the documentation or need to adjust the procedures, the organization must provide for document integration or corrective actions. The permanence of shortages at the time of the audit will prevent the issuance of the certificate and will make it necessary to carry out a mail audit.

The Halal certificate is approved by the Halal Certification Committee. The Committee is composed and directed by a President (Muslim qualified on the Islamic doctrine in food matters and on its modalities of translation in the current context), the Imam Saifeddine Maaroufi (Imam of Lecce and Director of the Islamic Cultural Center NOI Salento) and one or more certification experts (qualification of LA), appointed by the President, who have technical competence in the sectors subjected to certification. The Committee has the task of periodically meeting for:

- Examine the technical specification;
- Make any changes and/or additions to the specification;
- Approve the specification;
- Implement in the Halal Certification process any adaptations in the method of translation and application of the principles of Islamic tradition in food;
- To deliberate the issue, maintenance, suspension and revocation of the company conformity certificate;
- Decide to issue, maintain, suspend and revoke the qualification to the auditors for the Halal scheme.

The President has the right of veto on the certification deliberations, while the other members of the Committee act as advisors to the President regarding the evaluation of the requirements that are not Halal (technical requirements on the conduct of audits and application of the self-control system in hygiene and safety and related GMP).

5.3 Audit Steps

The Audit must be performed within 6 months of the document analysis, otherwise the Chairman of the Halal Certification Committee will assess the need to repeat the document analysis completely or partially, possibly on a documental basis. To achieve this certification is necessary a Pre-Audit step.

The Audit or Pre-Audit must include the following steps:

1. Opening meeting;
2. Collection and verification of information;
3. Facilities visit;
4. Sample collection;
5. Audit Team Meeting;
6. Closing meeting.

1. Opening meeting

- a) Present and identify the members of the audit team;
- b) To know the members of the organization that will participate in the audit and the respective roles within the organization;
- c) Complete the list of participants;
- d) Giving information to all members of the audit team on the confidentiality obligations;
- e) Confirm the purpose of the audit and the object of the certification;
- f) Confirm the audit plan;
- g) Describe the classification, methods for reporting and managing any non-compliance that may be detected during the audit;

h) Request for a meeting room to be reserved for use by the audit team.

2. Collection and verification of information

During the audit, information relevant to the objectives and scope of the audit, including information on the interfaces between functions, activities, processes, is collected through appropriate sampling. Methods for gathering information include: interviews, observation of activities, documents and company records.

The following aspects are studied during the audit: management commitment, scope of Halal procedures and requirements, responsible for Halal procedures and any collaborators with their respective job functions, a correct description of the product and intended use, layout of the facilities, flow chart of the production process, correct application of Halal procedures and requirements, Hazard Analysis and Critical Points Control (HACCP), control of suppliers, production equipment, cleaning and hygiene, staff, training.

3. Facilities visit

On-site verification of the process flow chart. Check on location of places, equipment, processes, procedures, materials, documents, food products.

4. Sample collection

If the state of the material is uncertain it is necessary to take a sample to be analyzed. Obtained precise information on the type of product, takes at least three samples of material, seals them and identifies them with the name, date and time of sampling

done, leaves a sample rate for the company, sends the second rate to the laboratory of analysis and retains the third as a reference sample.

5. Audit Team Meeting

The audit team discusses the elements detected.

6. Closing meeting

- Thanks for hospitality, collaboration and assistance;
- Compilation of the list participants;
- Indication of the fact that the audit is based on objective evidence collected on a sample basis;
- General impressions of the company's compliance status;
- Resolution of the issues not yet resolved;
- Presentation of the NC (non-conformities) detected and request of the CA (corrective actions);
- Reconfirmation of the certification field and of Halal products;
- Summary of the procedures following the audit;
- Delivery of the audit report.

5.3 Audit Renewal

The renewal audit aims to ensure that the Organization maintains an effective HALAL system, in compliance with the requirements, on products falling within the scope of the Halal Certification.

The renewal audit must be concluded, with a positive outcome (including any post-audit or approval of any proposal for Corrective Actions received from the Organization), by the validity date of the certificate to maintain its validity and historicity. Therefore, Imam Saifeddine Maaroufi or his delegate will contact the Organization in time to define the date of the renewal audit about 3 months before the expiry of the certificate. The renewal audit is based on the same procedures as the certification audit and the effective implementation of the results and comments that emerged from the previous audit is verified. As a rule, no derogation is applied to the date of execution of the renewal if not limited to serious situations communicated in writing by the Organization and evaluated and authorized by the Chairman of the Certification Committee.

If the organization does not intend to carry out the renewal audit, it must immediately send written notification to Imam Saifeddine Maaroufi. The execution of the renewal audit is subject to regular payment of previous activities by the Organization, otherwise Imam Saifeddine Maaroufi reserves the right not to perform the activities scheduled for the renewal audit. At the end of the renewal audit the relative report is delivered.

5.4 Pre-Audit Halal Preparation

Pre-Audit is conducted in the same way of Audit. In Pre-Audit step, there are several requirements to be respected for each system element:

1) System directional elements:

They are "mandatory elements", viewed and evaluated at each visit, that the top management of the organization should use to express and communicate their guidelines, establish the adequacy of the system and finalize the actions that lead to a continuous improvement of the system and the organization.

Requirements:

- Food and Equipment Safety Policy;
- Definition of the corporate indicators and objectives, their assignment to the different areas and consequent schedule for their achievement;
- Management review in which the company's top management analyzes the data of the system and gives directives on "how to move forward" and on "what to pay more attention", triggering certain corrective, preventive and improvement actions and their consequent control;
- System and organization changes;
- Internal inspections;
- Customer orientation/satisfaction, founding which information from the customer is necessary;
- Food Safety process mapping (actions performed in according to set goals);

- Resources availability;
- Corrective actions based on previous reviews.

2) System control elements:

They are the elements that more than any other should add value to the system, allowing it to evaluate effectiveness and efficiency by top management.

Requirements:

- Product non-conformity;
- Product non-conformity analysis;
- Corrective, preventive and improvement actions.

3) Certification and brand

Requirements:

- Use “HALAL” logo.

5.5 Gap analysis

Sidel has to be conformed to previous requirements to achieve Halal Certification.

To do this, we made some changes in Sidel policy and internal procedures adding Halal interested points:

- Additions to **Food and Equipment Safety Policy:**

- 1) Sidel emphasizes Islamic ethics and the importance of providing products and services that can be integrated into GMP management of a HALAL-based agri-food business according to Islamic Sharia (Islamic Law);
- 2) Sidel monitors and respects other relevant regulatory regimes and work with its customers to identify relevant specific requirements, including those resulting to the Islamic regime of the Koran and the Sunna regarding Halal products/services;
- 3) Sidel provides assurance that its products are designed, manufactured and put on service under the strictest hygienic and sanitary condition, in accordance to the Islamic faith.

- Additions to **procedure 05 “reviews, objectives, system programs”**:

- 1) **Top management** must ensure that the Halal policy is appropriate to the Halal principles, providing a structural framework for defining and reviewing the objectives, both communicated and understood within the organization, and reviewed periodically to verify their eligibility. Senior management must provide evidence of its commitment to the development and implementation of the Halal management system, ensuring the availability of adequate resources;
- 2) The **customer orientation** is a primary task of the company for which it must set objectives clearly understood by all resources and included in an effective system of operational processes having definite sequences and interactions, with decisions made on facts and analysis of data and information. It is the management's responsibility to communicate to the whole company the importance of being focused on the customer and to ensure that it: determine and understand the requirements of current and potential customers, identify the

implicit needs of customers in terms of the social environment in which they operate (such as, for example, geographical areas populated by Muslims), increase customer satisfaction, obtaining advantages in economic terms;

- 3) **Resources** must be identified, made available and appropriately managed: the appropriate infrastructures and the conditions of the working environments suitable for obtaining the conformity of the products/services to these requirements, human resources and tools necessary to meet the requisites required by the Islamic regime (Halal). People, at any level, are the essence of each organization; the management and planning of human resources development is an activity of strategic importance for the company. Sidel expressed a negative judgment against religious discrimination, both during the pre-employment phase and during the employment relationship. In particular: it has chosen not to use selective criteria that imply distinctions, exclusions, restrictions or preferences based on religious affiliation or opinions on religious matters or on religious practices. It has forbidden to assume the criteria of assumption of convictions in religious matters, protecting the worker's right not to suffer detrimental consequences due to the faith he believes. The Company promotes and manages activities aimed at training staff, believing that its adequacy at all levels is an essential condition for achieving company objectives deriving from the desire to meet the requirements imposed by the Islamic regime (Halal). To this end, the Company: ensures that staff are aware of the relevance and importance of their activities and how they contribute to achieve the goal, and preserves appropriate training records for staff;

4) **Management review** is necessary. Top management must, at pre-established intervals, review the organization's Halal management system to ensure its continued suitability, adequacy and effectiveness. This review should include evaluating opportunities for improvement and the need for changes to the quality management system, including the policy and objectives for compliance with the Halal principles.

- Additions to **procedure 04 “internal inspection of the environment and safety management system”**:

1) The organization must carry out internal audits at scheduled intervals to determine whether the Halal management system:

- complies with the planned provisions, the requirements of the Halal specification and the requirements of the Halal management system established by the organization itself;
- has been effectively implemented and maintained updated.

A program of audits must be planned that takes into account the status and importance of the processes and areas subject to verification. The criteria, extent, frequency and modalities of the audits must be established. The selection of the auditors and the conduct of the audits must ensure the objectivity and impartiality of the inspection process. The auditors cannot carry out inspections on their work;

- Additions to **procedure 05 “Management of non-compliance, preventive, corrective and improvement actions”**:

- 1) **Non-conformity of product:** It must be clearly defined what treatments should be performed on the product when monitoring shows that a parameter has exceeded the established critical limit and therefore the CCP is out of control (management of non-conformities). Having exceeded this critical limit, the product does not comply with the specified requirements and therefore cannot proceed to the subsequent stages, if not after an adequate resolution of the non-compliance relating to it;
- 2) **Analysis of product non-conformities:** A documented procedure must be prepared that specifies the requirements for: the review of non-compliance (including customer complaints), identification of the causes of non-compliance, assessment of the need to take action to avoid recurrence of non-compliance, identification and implementation of the necessary actions;
- 3) **Analysis of process nonconformities:** It must be clearly defined what actions need to be taken on the process when, from monitoring its performance, it appears that its logical structure may not achieve the desired objectives (management of corrective actions on the process);
- 4) **Corrective actions:** The organization must implement corrective actions to eliminate the causes of real non-conformities in order to prevent their recurrence. Corrective actions must be appropriate to the effects of the non-conformities found.

A documented procedure must be prepared that specifies the requirements for: review of non-compliance (including customer complaints), identification of the causes of non-compliance, the assessment of the need to take actions to avoid

recurrence of non-compliance, identification and implementation of the necessary actions;

- 5) **Preventive actions:** The organization must identify actions to eliminate the causes of potential non-compliance, to prevent these from occurring. The preventive actions implemented must be appropriate to the effects of potential problems. A documented procedure must be prepared that specifies the requirements for: identification of potential non-conformities and their causes, the assessment of the need to implement actions to prevent the occurrence of non-compliance, identification and implementation of the necessary actions.

- Addition to **procedure 16 “Legal requirements”:**

- 1) The company, in order to implement a proper Halal management system, must be previously in compliance with all the binding legislation relating to hygiene and safety requirements, such as the hygiene of building structures, facilities, auxiliary services, personnel, packaging and raw materials and semi-finished products.

- **Food Safety process mapping:**

The company clearly and in detail defines the process in the areas of its competence from procurement to transformation, marketing and distribution. This description is documented with a flow chart. The flow chart was designed

and implemented taking into account the company criteria for the execution.

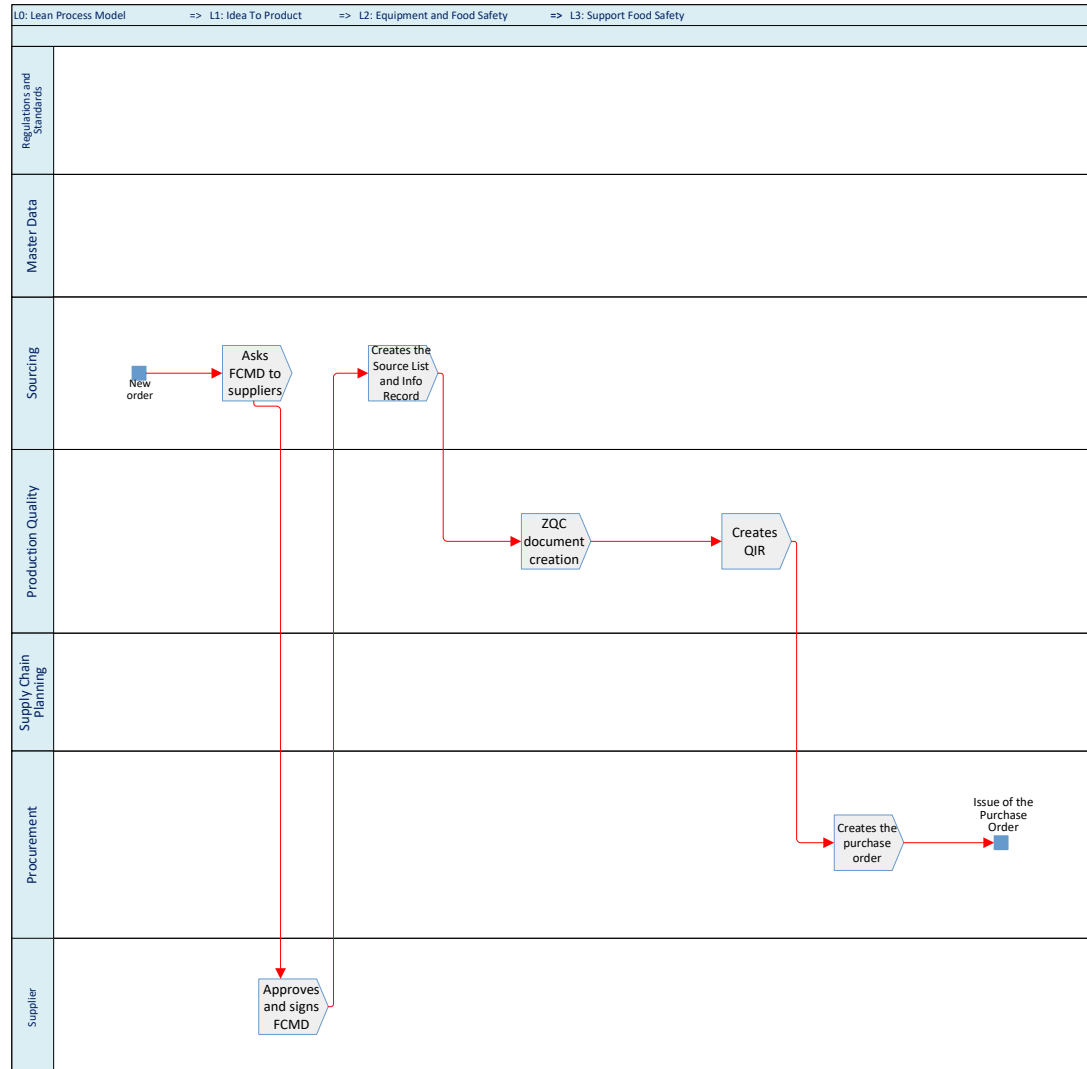


Figure 5.1: Food Safety Flow Chart

Source: author elaboration from Sidel Global Management System

Important documents are used in this flowchart like:

- 1) **FCMD**: A Declaration of Compliance states the compliance with relevant European and US Regulations and standards.

This Food Contact Materials Declaration of Compliance (FCMD) is used to ensure that a Supplier to SIDEL has its food contact materials documentation in

place, so that SIDEL can issue its own Declaration of Compliance related to the complete machine. In order for SIDEL to ensure that machines intended to come in contact with food respect Regulations, SIDEL must be confident that a supplier has manufactured or supplied an article compliant with the FCM legislation according to SIDEL's specification. The Food Contact Material Declaration (FCMD) document is used for this purpose. By completing this Declaration, you, as a Supplier, ensure that: for parts not designed by SIDEL, the part complies with the food contact materials legislation, the relevant requirements for Food Contact Materials set forth in the following documents:

- Regulation (EC) No. 1935/2004 on materials and articles intended to come into contact with food;
- Regulation (EC) No. 2023/2006 on good manufacturing practice for materials and articles intended to come into contact with food;
- US Regulation No. 21 CFR 117, Subpart B, that lists components that establish the conditions and practices the food industry must follow for processing food under sanitary conditions; Chinese Food Safety National Standard No. GB 4806.1-2016 on General Safety Requirements on Food Contact Materials and Articles;
- Chinese Food Safety National Standard No. GB 31603:2015 on Good Manufacturing Practice for Food Contact Material and Articles;
- Substances and mixtures participating in finished parts manufactured on SIDEL design, shall not be included on the Candidate List of Substances of Very High

Concern for Authorization according to Regulation (EC) No. 1907/2006 (REACH) Article 59;

- Substances and mixtures participating in finished parts shall not belong to the category of substances classified as "carcinogenic", "mutagenic" or "toxic to reproduction" (CMR) in accordance with the criteria set out in Annex I of Regulation (EC) No. 1272/2008.

Moreover, Sidel's commitment is in the following points:

- Traceability exists for all materials used to manufacture the part sold to SIDEL;
 - the manufacturing process of the part has followed Good Manufacturing Practices (GMP) for food contact materials;
 - all relevant tests for the qualification of the material/part have been carried out according the normal condition of use. SIDEL has defined the operating conditions since it is understandable that the Supplier does not know the details associated with the specific use of the parts.
- 2) **ZQC:** ZQC document safeguards and organizes certifications for the suitability to the contact with food and it is created and managed by the owner of the quality control documents. The connected document is the FCMD (Food Contact Material Declaration). The document description is always "Declaration of conformity".
- 3) **QIR:** Quality Info Record must be created only after FCMD determination and ZQC identify, following standard rules. QIR Goal is to unlock food contact items for procurement, at material master creation on plant, selecting the items that are relevant for the specific plant. Each Plant entity in charge of QIR creation and

management has the possibility to make analysis of new introduced items in a certain time window. This will enable to ask to supplier, or apply if already existing, the correct FCMD (stored in the proper ZQC document). Create the appropriate QIR link to the correct ZQC and enable the procurement of the item. The tool supporting this activity is SAP custom transaction ZRCGCPD.

5.6 Pre-Audit Halal

On 30th November 2017, Halal Lead Auditor (Imam Saifeddine Maaroufi) and a Notify Body TUV manager (Franco Tagliaferri) came in Sidel to check if Sidel processes are conformed to Halal system. A preliminary investigation or Pre-Audit service is an additional check prior to the audit to see whether the organization is ready for certification. This gives a clear picture of the status of Sidel system. During the Pre-Audit we received specific feedback from the auditor. A Pre-Audit is a good basis for the final certification and it is considered it a baseline measurement.

The Pre-Audit was organized in four phases:

- 1) Company presentation: in this phase there is an introduction to auditors about what Sidel produced, Sidel's history, presentation of different functions in the organization, which is its market role, Halal choice motivation, processes description. During this phase auditors didn't underline critical points which wouldn't allow certification release;
- 2) Facilities visit: during this phase the auditors interviewed several manufacturing workers to understand how they work and if they respect Halal requirements during their working activities. Auditors visited assembly area, final assembly area, machine tools area, acceptance of goods area, acid room, design area. In

particular, auditors were focused on the hygienic requirements adopted by operators, but also to the organic composition of the product contact material. In this context, they wanted to see all product sheets to check Halal conformity. Another critical point is the way in which machines were washed, in particular which chemical products are used to wash machines;

- 3) Documentation check: in this phase auditors studied Sidel policy and all procedures in which Halal should be involved. After this check several gaps emerged. Fortunately, they aren't difficult problem to resolve. For example, in Sidel documents there wasn't the indication of the Halal responsible name in Sidel organization. Another gap was a lack of religious aspects in Sidel customer satisfaction survey;
- 4) Pre-Audit Report: this is the official document released by Notify Body TUV in accordance with the Imam Saifeddine Maaroufi about Pre-Audit. In particular, what is wrong it is underlined. There are two measures: implementation and gap. The implementation is less difficult to resolve and it needs not much time. Basically, it is an action aimed to improve a specific activity like in the case of "It is recommended to extend the customer satisfaction survey with the integration of the HALAL requirements in order to assess the customer's perception of the satisfaction and compliance with the requirements dictated by the Islamic religion". Whereas gap is more difficult to resolve and it needs more time respect of implementation. An example is "The management review must be integrated with the review of the HALAL system".

Table 5.1: Pre-Audit Report
Source: Notify Body TUV

Referment regulations	Ḥalāl (حلال, ḥalāl, halaal)
Pre- Audit date	30/11/2017
Audit place	La Spezia Street, 241/A 43126 Parma (PR)

Ḥalāl (حلال ḥalāl, halaal) – Disciplinary HMS 01 rev. 0
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Organization	Sidel S.p.A.			
Legal address	La Spezia street, 241/A 43126 Parma (PR)			
Facilities address	La Spezia street, 241/A 43126 Parma (PR)			
Organization responsible	Alessandro Bonati			
HLA / HTA / Oss.	Imam Saifeddine Maaroufi / Franco Tagliaferri			
Manual (ed. / rev. / data)	Man. HALAL rev. 00 29.11.2017 Food safety risk assessment rev. Del 9.6.2017			
Certification application field:	Design, manufacturing, machines assistance for the conditioning of food liquids			
Encoding EA / NACE	Primary	HALAL - 18	Secondary	///
Total number employed	800		Work shifts:	2

Element	Implementation yes / no	GAP	Comments
5.3	X		Determinate the Responsible for the HALAL system
5.3	X		Formalize measurable objectives on Halal system
5.8.4	X		It is recommended to extend the customer satisfaction survey with the integration of the HALAL requirements in order to assess the customer's perception of the satisfaction and compliance with the requirements dictated by the Islamic religion
5.8.3	X	Internal audits must be integrated with the verification of the Halal requirements	
5.5	X	The management review must be integrated with the review of the HALAL system	
5.7	X		It is recommended to further emphasize the HALAL requirements between the elements involved in design and development
5.9	X		It is recommended to verify the suppliers' involvement where

			products or processes impacting the Halal principles are purchased from the suppliers, in order to ensure that procurement information describes the products to be purchased in accordance with the Halal principles
5.2.4	X		It is recommended to finish training program foreseen for the HALAL staff

5.7 Pre-Audit Halal Conclusions

From the document released by Notify Body TUV in accordance with the Imam Saifeddine Maaroufi it can be concluded that Pre-Audit was positive. This is a proof of Sidel commitment in food safety. In fact, there were only two gaps that aren't difficult to fill. Regarding the implementations emphasized in the report by the auditor, the most difficult to resolve was the customer satisfaction survey. In Sidel customer satisfaction survey is essential and many resources are spent to improve that. However, there isn't defined criteria about ethics, social, religious context. For this reason, it wasn't easy to insert this criteria to Sidel customer satisfaction survey. Other factors to be implemented are: identify the management representative of the Halal system, formalize measurable objectives on Halal system, emphasize Halal requirements in the design and development phase, suppliers involvement, staff

training program. Whereas the two gaps to fill are internal audits and management review.

Top management review was essential to respect Halal requirements and to fill the gaps. Top management should ensure the necessary resources (human, material, economic) and its decisions should address Sidel products to conform to Halal requirement. In this context, top management involvement should be consistent and fast to respond in the best way to middle management. For example, to a middle management request to modify an internal document or a procedure top management should be responsiveness.

CHAPTER 6

HALAL CERTIFICATION RELEASE

6.1 Audit Halal Preparation

It took a period of four months to fill the gaps and to implement the critical factors.

It focused on the different aspects working step by step.

6.1.1 Halal Responsible

Establish a management representative who is responsible for Halal within Sidel and in representation of Sidel. Halal responsible should be a person with both human psychology as well as expert tactics. In the following sentences there is a description how Halal leader should be.

An Halal leader must lead himself, only then he can lead others. He must be committed on personal and professional front. He must be a role model for others and set an example for them. He should motivate the employees well so that they are committed to respect Halal requirements. He should be well acquainted with them, have concern for them and encourage them to take initiatives. This will result in more efficient and effective employees and ensure organizational success. He should not hurt any employee. A true leader should not be too bossy and should not consider him as the supreme authority. He should realize that he is part of the organization. A leader drives and influences the followers to achieve the Halal goals, in case of team work, organizational quest, or any project. It is an ethical job of the leader to treat his subordinates with respect as each of them has unique personality. The ethical environment in an organization is built and developed by a leader as they have an

influential role in the organization and due to the fact that leaders have an influence in developing the organizational values, in this case Halal values. An effective and ethical Halal leader has the following characteristics:

- Dignity and respectfulness: ethical leader respects others. He should not use his followers as a medium to achieve his personal goals and he should respect their feelings, decisions and values. Respecting the followers implies listening effectively to them, being compassionate to them, as well as being liberal in hearing opposing viewpoints. In short, it implies treating the followers in a manner that authenticate their values and beliefs;
- Serving others: he serves others. An ethical leader should place his follower's interests ahead of his interests. He should be humane. He must act in a manner that is always fruitful for his followers;
- Justice: he is fair and just. An ethical leader must treat all his followers equally. There should be no personal bias. Wherever some followers are treated differently, the ground for differential treatment should be fair, clear, and built on morality;
- Community building: he develops community. An ethical leader considers his own purpose as well as his followers' purpose, while making efforts to achieve the goals suitable to both. He is considerate to the community interests. He does not overlook the followers' intentions. He works harder for the community goals;
- Honesty: he is loyal and honest. Honesty is essential to be an ethical and effective leader. Honest leaders always earn respect of their followers. An honest leader presents the fact and circumstances truly and completely, no matter how critical

and harmful the fact may be. He does not misrepresent any fact. Halal leadership has a moral and ethical aspect. Leaders can use the above-mentioned traits as rules for influencing their own behavior.

6.1.2 Measurable Objectives

Sidel sets the following objectives regarding Halal system:

1. Short-term objectives: Halal certification achievement;
2. Long-term objectives: new version of Food Contract Material Declaration (FCMD). The target is to insert Halal product conformity in the document after management approval.

6.1.3 Customer Satisfaction

Sidel customers base in one of company biggest asset. Customers have invested on Sidel to grow their business while Sidel needs to invest on customer relationship to sustain and grow our business.

Particularly, Sidel customer satisfaction has given great insight into how customers perceive the company and a chance to improve their perception and strengthen Sidel customer relationships. When customers are satisfied, they renew their confidence in Sidel company. Customers need to see Sidel a partner from beginning to end, and the company needs to take every opportunity to show it understands their needs, and to improve its relationships with each of them. This is what Sidel means with “Performance through Understanding”. From data provided by Sidel, in 2017, 4 274 surveys were sent to customers at various customer touchpoints on the customer journey and 1140 responses were received (27%

response rate). 110 responses were from customers who had been through the pre-contracting phase, 82 were from customers who had been through the execution phase and 948 responses were for other touchpoints. Sidel collected feedbacks from 480 promoters and 181 detractors for which specific action plans have been defined. Some of the customers' feedback included Sidel is "an excellent company to deal with" and is a "knowledgeable and flexible team that works quickly to meet project/customer needs" to more constructive feedback like "project management needs to be improved" during execution.

Sidel market analysts have defined four priority touchpoints to drive the Customer experience journey:

1. Pre-contracting: When Sidel wins or loses an equipment deal;
2. Project execution: When Sidel completes the equipment project and hands it over to customer;
3. Services intervention: When Sidel performs a repair intervention;
4. Sidel services online: When Sidel sells spare parts and kits;

Sidel have chosen two main metrics:

- Net Promoter Score (NPS): measuring overall Company loyalty. On a scale from 0-10, how likely are you to recommend company X to a colleague or a friend

How likely are you to recommend "BU" to a colleague or an industry peer?

Not at all likely Extremely likely

0 1 2 3 4 5 6 7 8 9 10

Figure 6.1: NPS Question Example
Source: Sales and Marketing team documentation

Depending on the NPS results Sidel customers are divided in three categories like in the scheme below

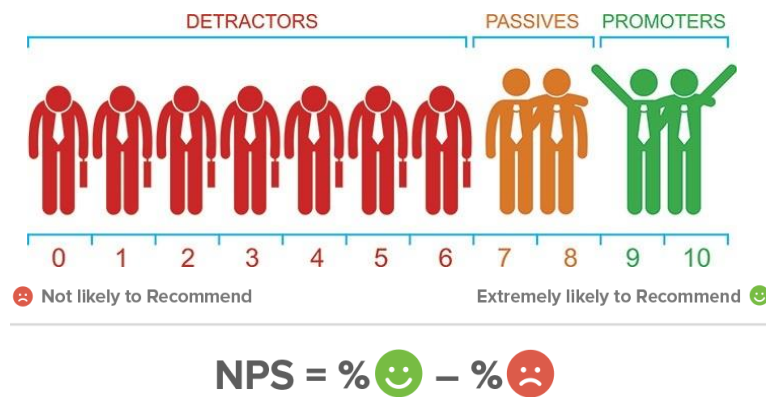


Figure 6.2: NPS Customers Categories
Source: Sales and Marketing team documentation

- a. Customer Satisfaction Score (CSAT): measuring specific product/service satisfaction. On a scale from 1-5, how satisfied are you with product Y/Service Z;

How satisfied are you with the execution approach of the project "pipng project info"?

Very dissatisfied Somewhat dissatisfied Neither satisfied or dissatisfied Somewhat satisfied Very satisfied

Figure 6.3: CSAT Question Example
Source: Sales and Marketing team documentation

Below an example of Sidel customer satisfaction and how pre-contracting survey works, which includes both Net Promoter Score (NPS) and Customer Satisfaction Score (CSAT).

Sidel Performance through Understanding

English

How likely are you to recommend Sidel to a colleague or an industry peer?

Not at all likely Extremely likely

0 1 2 3 4 5 6 7 8 9 10

What is the **main reason** for your rating?

How **satisfied** are you with the **offer preparation approach** of the project in ?

Very dissatisfied Somewhat dissatisfied Neither satisfied or dissatisfied Somewhat satisfied Very satisfied

Figure 6.4: Example of Customer Satisfaction Survey
Source: Sales and Marketing team documentation

When customer clicks on a score, he is automatically redirected to the platform to complete the other questions. Between the four touches the most appropriate survey

for our intent is the pre-contracting survey. In fact, in pre-contracting survey the “understanding and meeting your requirements” phase is fundamental. This phase could include the Halal requirements. Let Sidel know how important the following criteria are in the pre-contracting approach and allow customers to share their experience.

	Level of satisfaction				
	Very poor	Poor	Fair	Good	Very good
Relationship with Sales and Project teams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understanding and meeting your requirements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Responsiveness of the proposal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Innovation of our solutions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quality of the line concept / solution	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Confidence in delivering commitments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Total Cost of Ownership (TCO)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
After-sales support capabilities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Price of the solution	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Easiness to do business with	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other, please specify: <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Do you have any additional comments to help us **improve your experience** with us?

Figure 6.5: Criteria in Pre-Contracting Approach
Source: Sales and Marketing team documentation

The combination between NPS and CSAT allows Sidel to categorize the customers and take corrective actions, the categories are:

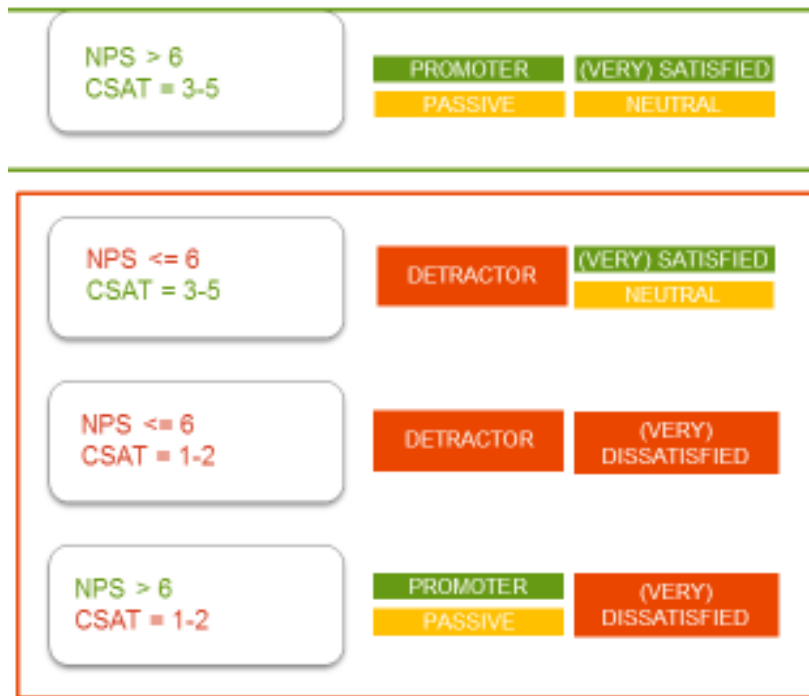


Figure 6.6: NPS and CSAT Customers Categories
Source: Sales and Marketing team documentation

To respect Halal conformity, we have to modify this customer survey. More specifically we should add a specific survey for safety and food safety.

The targets for this survey are:

- Achieve customer feedback regarding our approach to Safety and Food Safety topic;
- Measure specific product/service satisfaction;
- Support our continuous improvement.

Whereas the questions are:

- 1) One of the top priorities for SIDEL is Equipment Safety and Food Safety;
- 2) The activities with which SIDEL acts in relation to the Equipment Safety and Food Safety topics are in line with market demands;

- 3) The activities with which SIDEL acts in relation to the Equipment Safety and Food Safety topics are aligned with its major competitors;
- 4) Fulfilling the legal requirements related to the Equipment Safety and Food Safety topics matches customer's expectations;
- 5) Ethical, social and religious requirements (Halal, Torah, etc.) related to food safety is perceived as added value in the policy implemented in SIDEL;
- 6) Achieving third-party certifications (for example Halal) adds credibility to the food safety policy implemented in SIDEL.

The answers are evaluated by Customer Satisfaction Score (CSAT) which measures specific product/service satisfaction. On a scale from 1-5.

6.1.4 Internal Audits

The Internal Audits should demonstrate that Sidel activities are integrated with Halal requirements. In particular, food contact material is conformed to Halal principles.

In order to carry out these tests, the internal audit is designed to:

- Interview several manufacturing workers to understand how they work and if they respect Halal requirements during their activities;
- Emphasize the hygienic requirements adopted by operators;
- Retrieval information about organic composition of the product contact materials;
- Material respects food safety internal documentation.

Internal Audit program follows this planning rules:

- Duration: three hours;

- Periodicity: once a year;
- Auditors team: PM&D Regulation & Standards team;
- Audit application field: Food contact material;
- Areas subjected to the Audit: assembly area, spare parts area, quality control area;
- Personal interviewed: assembly responsible, spare parts responsible, quality control responsible;

Audit targets are:

- Evaluate if the material is in contact with the product and it is conformed to Halal system;
- Check the existence of documentation (instructions, procedures) related to contact material;
- Verify that the materials in contact with the product have valid QIR and FCMD.

In the next page, there is an example of an Internal Audit executed.

INTERNAL AUDIT REPORT

Date of drafting the report: 01/02/18

Audit Data: 01/02/18

Subjected area to the Audit: assembly area, spare parts area, quality control area

Audit application field: Food contact material

Audit team: Luca Caffarelli, Alessandro Bonati

NOTE: The selection of the evaluators and the conduct of the audit ensure the objectivity and impartiality of the audit itself

Personal interviewed: assembly responsible, spare parts responsible, quality control responsible

NOTE: The presence of the people listed above makes the audit considered "internal" only partially; in fact, a part of the verification is considered to be of 2nd part.

Audit targets:

1. Evaluate whether the material is in contact with the product
2. Check the existence of documentation (instructions, procedures)
3. Verify that the materials in contact with the product have valid QIR and FCMD

Table 6.1: Internal Audit Report

Source: author elaboration

REQUIREMENTS	C	O	NC	EVIDENCE
System elements	X			Food contact material
Evaluation process objective	X			Verify that the food contact material has valid QIR e FCMD and conformed to Halal system
Process map	X			Food process map is in share point

REQUIREMENTS	C	O	NC	EVIDENCE
Reference documentation		X		<p>Correct assembly procedure (emission date and valid date not found)</p> <p>Product sheets of material into contact with the product:</p> <p>LAC061 (exposed code not found) Product name: PARALIQ GTE 703 Article number: 022148 Chemical nature: silicone oil, PTFE</p> <p>LAC079 Product name: Klüberpaste UH1 84-201 Article number: 005113 Chemical nature: synthetic hydrocarbon oil, PTFE, solid lubricant</p> <p>LAC068 Product name: Klübersynth UH1 14-222 Article name: 096071 Chemical nature: synthetic hydrocarbon oil, ester oil complex aluminum soap, solid lubricant</p>
Responsibility definition	X			Each operator knows what he must do

Process input definition	X			Material into contact with the product
Product/service realization and management	X			Supplier Control (purchase request reception, FCMD and QIR validity verification, ZQC control key on SAP, acceptance purchase request)
Process output definition	X			Materials into contact with the product conformed to the Halal safety requirements
Infrastructures	X			Presence system of derating, processing areas adequately circumscribed
Process efficiency/ effectiveness indicators	X			Product sheets, SAP documents

LEGEND

Conformity = What has been found during the inspection is compliant with what is reported in the system documentation and/or the reference standard.

Opportunity = The operation is compliant with the applied standard and/or as reported in the system documentation, in fact the registrations are not properly completed or the activities are not shared with the competent authority, in short, improvements are needed.

Non-Conformity = What has been found during the inspection is different from what is reported in the system documentation (non-existent records, activities carried out in a manner inconsistent with what is described). The anomaly cannot be resolved immediately and corrective actions are needed.

CONCLUSIONS INTERNAL INSPECTION REPORT

Are the processes analyzed to be carried out in an effective manner?

☒ yes ☐ no

Are there corrective actions for previous checks?

☐ yes ☒ no

Are there serious non-conformities that influence the operation of the process?

☐ yes ☒ no

Are there minor non-conformities that need to be resolved in short time?

☒ yes ☐ no

1) Lack of certain procedures and product codes exposed

There are observations that are suggested to be taken into consideration to evaluate opportunities for improvement of the whole process?

☐ yes ☒ no

From these conclusions, it is possible to conclude that the Internal Audit demonstrates that Sidel activities are integrated with Halal requirements.

In particular, food contact material is conformed to Halal principles.

6.1.5 Supplier Involvement

Sidel gives great importance to the relationship with suppliers. The company focuses on continuous improvement of strategic and preferred suppliers with the aim of operating best practice and improving productivity, quality and lead times.

Now there is a collaboration between Sidel and suppliers, in which both respect

mandatory requirements, So, Sidel commitment, regarding Halal topics, is to involve suppliers in the Sidel system. In particular the idea is to include Halal requirements in FCMD. This won't take difficulties because probably most of suppliers are conformed to Halal requirements.

6.1.6 Management review

Management review must be integrated with the review of the Halal system. Our idea is to insert Halal system review in:

1) Equipment & Food Safety Governance Forum:

The purpose is to govern Equipment & Food Safety across the organization including policy elaboration, implementation, initiatives and standards, review of A&I (the term Accident & Incident covers actual, potential or perceived risks of harm to: people at a customer's site (ex. machine related injury), customer's property (ex. fire, or falling heavy load), consumer health due to actual or potential food contamination (chemical, microbiological, foreign bodies)), risks management, initiative prioritization and roadmap approval and follow up.

The chairperson forum is Modular Office & Engineering Support Vice President, while the owner is Product Management & Development and Regulation & Standards Manager.

The main activities are:

- Manage Equipment & Food Safety policy and Recommend approval to GLT;
- Approve & Govern policy implementation (escalate to GLT/management);
- Collect & Evaluate Risks;

- Assess the maturity of the business in regards of Equipment & Food Safety;
- Decide on focus areas for Equipment & Food Safety, New legislations;
- Approve actions to address regulatory and industry trends on Equipment & Food Safety;
- Prioritize initiative and validate Initiative Roadmap – Priority vs Costs, Customer Requests;
- Approve internal food safety standards and be informed of all unit/function specific standards changes;
- Act as escalation forum for all Equipment & Food Safety related to A&I (excluding issues escalated through crisis management);
- Decide on attendance in regulatory body, participation and objectives (escalate to GLT/management).

So, in Governance Forum Halal system can be reviewed and it is possible to take corrective actions about this system if Top Management agrees. In particular Halal can be included in “Act as escalation forum for all Equipment & Food Safety related to A&I (excluding issues escalated through crisis management)”.

2) Equipment & Food Safety Technical Forum:

The purpose is to drive Equipment & Food Safety across the organization, review of A&I, initiative identification and roadmap proposal, implementation and follow up. Moreover, another aim is to prepare Equipment & Food Safety Governance Forum described previously. The chairperson and the owner forum are the same manager that is Product Management & Development and Regulation & Standards Manager.

The main activities are:

- Apply, drive & track policy and process implementation;
- Collect, evaluate & analyze and prioritize risks;
- Implementation of actions on focused areas for Equipment & Food Safety, new legislations;
- Implement actions to address regulatory and industry trends on Equipment & Food Safety;
- Define & Prioritize initiative Roadmap – Priority vs Costs, Customer Requests;
- Define internal food safety standards and be informed of all unit/function specific standards changes;
- Act as a preparation forum for all Equipment & Food Safety related to A&I (excluding issues escalated through crisis management);
- Identify, apply & report back on participation in regulatory;
- Define, implement & track trainings on Equipment & Food Safety to all Sidel community;
- Share best practices and implement harmonization.

Regarding Halal system, Technical Forum is useful to discuss inside the team how Halal system works and to generate new proposals for Top Management in Governance Forum. In particular Halal can be included in “Act as escalation forum for all Equipment & Food Safety related to A&I (excluding issues escalated through crisis management)”.

3) Equipment & Food Safety Policy:

- The Sidel Group is committed to food and equipment safety. Food and equipment safety are a critical element of its business and success in the market place. This Policy aims to help the Sidel Group to deliver on this commitment by clarifying the scope and the ambitions to secure and improve the capability of the company in the area of food and equipment safety. The Policy is the responsibility of all Sidel employees to implement within their respective responsibilities. All Sidel business processes must integrate food and equipment safety requirements as relevant to the products and services. Sidel ambitions in terms of food and equipment safety are determined by its role as a manufacturer of equipment and provider of processing and packaging equipment to food producers:
- Sidel commits to delivering products and services that are safe for their intended use;
- Sidel recognises the expectations of customers in terms of food and equipment safety and will retain responsibility for its own supply chain, in return we place the same expectations on our suppliers;
- Sidel sees itself as a partner to its customers to deliver safe food products to the market;
- Sidel emphasizes Islamic ethics and the importance of providing products and services that can be integrated into GMP management of a HALAL-based agrifood business according to Islamic Sharia (Islamic Law).

In the context of this role, in the value chain of food industry:

- Sidel will not compromise with food or equipment safety;

- Sidel will work in an aligned way within Sidel to provide a seamless solution to customers, working with our suppliers as needed for instance where a Sidel line incorporates non-Sidel pieces of equipment;
- internationally leading regulations and industry-wide recognised standards are applied as the global baseline for our equipment safety assessment, for this reason all equipment supplied globally comply with EU machinery safety requirements, as evidenced in Declaration of quality;
- Sidel monitors other relevant regulatory regimes and work with our customers to identify relevant specific requirements, including those resulting to the Islamic regime of the Koran and the Sunna regarding Halal products / services;
- Sidel provides assurance that our products are designed, manufactured and put on service under the strictest hygienic and sanitary condition in accordance to the Islamic faith;
- Sidel bases its decisions, relating to food and equipment safety, on scientific facts and evidence. It shares common goals with its customers and leverage input from customers and leading industry standards to improve food and equipment safety and include this input in Sidel decision making.

6.1.6 Staff Training Program and Design and Development Phase

In the table below, there is the staff training program. Each worker takes part to a course of the duration of 15 hours. This course is divided in two main topics:
Machine safety, Food safety.

Table 6.2: Staff Training Program

Source: author elaboration from Certification, Standard and Export Control team documentation

ITEM	DESCRIPTION	DURATION	WHERE	TO WHOM
1				
1.1.	<i>Safety of machineries</i>	2 h	PARMA	PM&D – Automation PM&D – Module Development PM&D – Product & Platform Mgmt. SC – Plants SC – Project & Field Execution
	General elements (legal, standards, policies)		MANTOVA	
	Conflicts between SIDEL legal authority to make technical safety choices and customers requests for safety Safety of SIDEL workers and customers workers Machine assessment and Notify Bodies intervention		OCTEVILLE	
1.2	<i>Risk assessment</i>	1,5 h	PARMA	PM&D – Automation PM&D – Module Development SC – Plants SC – Project & Field Execution
	Risks analyses and risk evaluation		OCTEVILLE	
	Risk evaluation methodologies Residual risks and documentation for Customers			

	Safety checks and requested tests			
1.3	<i>Calculations and reports</i>	1 h	PARMA	PM&D – Automation PM&D – Module Development
	Performance Level evaluation Performance Level calculation systems		OCTEVILLE	
1.4	<i>Low Voltage and EMC</i>	6 h	PARMA	PM&D – Automation
	Low Voltage requirements in the design phase EMC requirements in the design phase		OCTEVILLE	
2				
2.1	<i>Requirements for machinery intended for use with food products</i>	1,5 h	PARMA	PM&D – Module Development SC – Project & Field Execution Sourcing
	Customers’ obligation and SIDEL responsibilities Laws and regulations structure		MANTOVA	
	Food Contact Material Declaration (FCMD) and Suppliers responsibilities Halal requirements		OCTEVILLE	

2.2	<i>Food safety risk assessment</i>	1,5 h	PARMA	PM&D – Module Development Sourcing
	Hygienic design principles Food safety management process and procedures Food risk assessment and evaluation methodologies		MANTOVA	
			OCTEVILLE	

To conform to Halal Pre-Audit recommendations, we add in Food safety topic Halal requirements. Moreover, the design and the continuous development are emphasized during the staff training. So, for example, hygienic design principles in Food safety risk assessment are important elements.

In order to verify the correct understanding of the staff, each worker is subjected to a questioner which is evaluated by the top management.

The questions are the following:

- 1) Why sidel created the food contact material declaration (FCMD)?
 - a) In case of food contamination, without that signed form, the competent Authorities are able to proceed with an entry of the crime report
 - b) Eliminate risks, claims and give safety to customers, conformed to SIDEL Food Safety Policy
 - c) Because requested by food products machine manufactures to be conformed to regulation CE 1935/2004
 - d) Only if our customers ask us

- 2) Which of these items can be considered into contact?
- a) The filling valve fixing plate
 - b) The traditional roof fillers for cans
 - c) The base of the aseptic filling machines for PET bottles
 - d) The CIP relay pump
- 3) Which articles are declared to contact with the food product?
- a) Only articles belonging to the circuit that carries the bottled food product
 - b) All items that can enter directly or indirectly in contact with the food product or with the container
 - c) All items that can enter directly or indirectly with food only
 - d) When the article in contact with the food product changes its color
- 4) Who has the responsibility of signing FCMD?
- a) The Supplier of the article, even if it is not the manufacturer of the same
 - b) The Supplier of the article, but only if it is also the manufacturer
 - c) All the designers of the SIDEL Technical area
 - d) The Supplier of the article and, if it is not also the Manufacturer, with a joint signature by the latter
- 5) In Sidel, who has the responsibility to request the signature on the fcmd?
- a) Procurement staff, in case of renewal of FCMD expired
 - b) All the designers of the Technical area, for each new codification
 - c) Personnel belonging to the Sourcing area, in case of re-sourcing
 - d) The set of the three previous answers, according to the cases (renewal, new coding, re-sourcing)

- 6) What are the responsible area in the management of FCMD?
- a) All areas of SIDEL involved in the procedure
 - b) Only the Technical area of SIDEL
 - c) Only the Sales area
 - d) Only the SIDEL Procurement area
- 7) IN SIDEL, who has the responsibility to check the presence of correct FCMD?
- a) Both the activities are under the Technical area
 - b) FCMD check is under the responsibility of Sourcing area, while the check of the correct filling is the responsibility of Quality area
 - c) FCMD check is under the responsibility of Quality area, while the check of the correct filling is the responsibility of Sourcing area
 - d) Only to A. Mameli; in his absence M. Porcari for rubber / plastic articles and A. Bonati for stainless steel items are delegates
- 8) What is a massive certificate?
- a) A certificate issued by SIDEL Sourcing with which all missing FCMDs are remedied
 - b) A mass certificate higher than the reference code
 - c) A certificate issued by the Technical area of SIDEL which certifies the compatibility of a product family to food contact
 - d) A certificate signed by the Supplier certifying the food compatibility of a family of articles

The answers are b); d); b); a); c); a); b); c); b); a).

Basing on the staff answers, the management understands if the workers received the main Machine safety and Food safety principles and the course was useful and taught in right way. If the main topics of the course don't understand by the personal it would be possible to organize the training.

6.2 Audit Halal

All this preparation work aims to Halal Audit which it will be on 14 and 15 on May 2018. This audit will decide if Sidel is Halal certified.

CHAPTER 7

CONCLUSIONS

The research objective was to achieve Halal Certification for Sidel. Halal Certification project can be summed up in four main stages. The first stage was the application for Certification by submission of a formal request, providing product and production details. The second stage was a review of the formal application in respect of both technical and Islamic requirements. The third stage was an audit of the premises concerned, to ensure that it complied with technical and Islamic requirements, and by taking laboratory samples, if necessary. This stage was divided in Pre-Audit phase and Audit phase. The fourth stage was the certifying of the company by issuing a Halal Certificate valid for one to five years. While the first two stages were substantially documental phases and the work was to collect the different documents, the third took long time and commitment.

First of all, the Pre-Audit preparation. There are several requirements to be respected for each system element conformed to Halal system:

- 1) System directional elements: Food and Equipment Safety Policy, definition of the corporate indicators and objectives, management review, system and organization changes, internal inspections, customer orientation/satisfaction, food safety process, resources availability, corrective actions based on previous reviews;
- 2) System control elements: product non-conformity analysis, corrective, preventive and improvement actions.

Sidel must comply to previous requirements to achieve Halal Certification. To do this, we made some changes in Sidel policy and internal procedures.

Secondly, the Pre-Audit execution. Halal Lead Auditor (Imam Saifeddine Maaroufi) and a Notify Body TUV manager (Franco Tagliaferri) came in Sidel to check if Sidel processes are conformed to Halal system. A preliminary investigation or Pre-Audit service is an additional check prior to the audit to see whether the organization is ready for certification. This gives a clear picture of the status of Sidel system. During the Pre-Audit we received specific feedback from the auditor. Pre-Audit report is the official document released by Notify Body TUV in accordance with the Imam Saifeddine Maaroufi. In particular, it is underlined what is wrong. There are two measures: implementation and gaps. The implementation is less difficult to resolve and it needs not much time. Basically, it is an action aimed to improve a specific. Whereas gap is more difficult to implement and it needs more time respect of implementation.

Thirdly, Audit Halal preparation. The primary objective of this phase was to fill the gaps and to implement the critical factors emphasized in Pre-Audit Report. So, the followings problems are studied and resolved: determinate the responsible for the Halal system, formalize measurable objectives on Halal system, extend the customer satisfaction survey with the integration of the Halal requirements in order to assess the customer satisfaction and compliance with the requirements dictated by the Islamic religion, integrate internal audits with the verification of the Halal requirements, integrate the management review with the review of the Halal system, emphasize the Halal requirements between the elements involved in design and development, verify the suppliers involvement.

Lastly, the Audit execution. The Audit is planned for 14 and 15 on May 2018. This audit will decide if Sidel is Halal certified. The execution scheme is the same of the Pre-Audit.

The fourth stage is the Halal Certification release after Halal Audit. The Certification has to be revised and confirmed every year by the Notified Body and after three years a new complete audit has to be carried out.

7.1 Future Research

The future research regarding Halal Certification could be aimed to improve the entire supply chain in Sidel from supplier to customer. In this way, the products and the services will improve their performances. Consequently, Sidel customers will be more satisfied. A long-term objective is a new version of Food Contract Material Declaration (FCMD) to improve the collaboration with the suppliers.

Another future research could be addressed to extend ethical, cultural and religious requirements of the customers with other religions or cultures.

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