

# **Gaining marketing information for internationalization: Case industrial B-to-B product manufacturer**

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<p>The Company in this case study operates in the pneumatic sector. Company's main business field is manufacturing of pressure equipment for industrial applications for B-to-B customers. Company is motivated for internationalization but lacks adequate information about its target market and its requirements. This lack of information about target market is the research problem for this thesis.</p> <p>Company is based in Russia. It has decided to enter the Finnish industrial pressure equipment market. In order to gain knowledge on the new foreign market there were various secondary and primary sources researched using fundamental theoretical approaches.</p> <p>Research was aimed at collecting marketing information at three levels, namely: (i) the macro-environment level, (ii) the industry structure level and (iii) at the product suitability level. The research also informs decision making in the area of market entry, i.e. whether to enter the market via export or direct foreign investment. In addition, the research provides a description of the industry and helps the company determine the need for adapting its products according to the requirements of the new market.</p> <p>Research results are of three types: (i) regulations and requirements of target market, (ii) analytical information on market dynamics and relationships, and (iii) information concerning the product itself. Being an industrial product case, a basic assumption of this study is that the product is used for business customers. Therefore, it is subject to general legal issues and technological regulations. Awareness of the industry structure and its practices helps ensure successful decision making and strategies. Knowledge of target market requirements towards the product highlights prospects for product development which in turn can enhance the competitiveness of the case company on the international market in the long-run.</p> <p>Gained marketing information is considered to be either sufficient for internal strategic decision making purposes or useful as a base for the further research.</p>	
<b>Keywords</b> Pre-internationalization, search and translation of marketing information, macro-environment, industry structure, product suitability	

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# 1 Introduction

Internationalization of firms and foreign market entry requires developing of a strategy based on the country and industry markets features combined with the firm's capabilities. International business usually entails greater uncertainty and unknowns compared to domestic business. The more in-depth information firms have about target market and practicalities of doing business there the easier it is to make right strategic decisions, which are beneficial to the firms in the long-run. Making good choices depends on having objective evidence and hard data about what products to offer, where to offer them and how to offer them. (Cavusgil, Knight & Riesenberger 2012, 372.)

A basic scheme of internationalization involves: (i) identification of foreign customers' needs, (ii) developing the product to satisfy them, and (iii) delivery of the product using one or a combination of foreign market entry modes (Bradley 2002, 12). According to Hollensen's (2012, 35) internationalization is preceded by a pre-internationalization process, which starts from stimuli to initiate international markets expansion coming from inside or outside the firm, and ends with awareness of firm's capability to put internationalization into action. In all stages of the process, managers use information to get enough knowledge to be able to proceed with planning and implementing of internationalization. Moreover, search of the information and its translation is defined as a self-sufficient stage of the process. Hollensen (2012, 45) even names it "the most critical factor" of pre-internationalization. Acquiring appropriate information and translating it into usable knowledge bring the firm to the stage of "internationalization ready", and facilitates an expansion to foreign markets (Hollensen 2012, 35, 45).

Insufficient knowledge of target market and lack of adequate information on potential foreign customers, competition and foreign business practices is considered as one of the internal barriers, which might occur within a firm and hinder success of internationalization (Hollensen 2012, 46). Factors considered as external barriers are related to the business environment and include general market risks, commercial and political risks, competition, product usage, business practicalities and issues resulting from intervention by home and host countries (Hollensen 2012, 47-49). Analysis of the external environment and its evaluation seem to be prior and obligatory conditions for an effective assessment of internal capabilities of the firm. To be able to assess their potential and possibility for success abroad firms have to get insight into the foreign environment.

## 1.1 Background

The focal point of the study is external part of the pre-internationalization process. The thesis purpose is to conduct research of the foreign target market for the commissioning company (further Company) focusing on the issues relevant to its business operations. Company considers expanding into a foreign market. It is undergoing the stage of initiating the internationalization process. The problem, Company currently faces, is very limited information on the target market and poor knowledge of the business environment into which it aims to enter. At the moment Company does not have insight of how its internal capabilities fit the conditions of the target market. This thesis suggests an approach for searching and gaining information beneficial for strategic decision making.

According to Cavusgil et al. (2012, 372-373), before internalizing, firms should assess their "global market opportunities". The process involves analysis, assessment and estimation of: a) internal capabilities of the firm, b) possible partners, and c) external aspects of the environment. Analysis of the external environment focuses on:

- firm's product suitability to the requirements of the target market as it is determined by target market customers' preferences, laws and regulations affecting the product, competitors' offerings
- geographical market potential with regard to its size and growth, customer's buying power, infrastructure and practicalities of doing business, country risks
- industry market potential examining industry trends, intensity of rivalry, standards and regulations, specific requirement set by the industry (intermediaries, customers) (Cavusgil et al. 2012, 373)

Similar external aspects have to be also examined when choosing the most suitable mode to enter a foreign market. In addition to internal capabilities of the firm, decision on the most beneficial way of firm's presence abroad either through exporting, foreign direct investment (further FDI) or partnering depends also on the external circumstances of the business environment. Among external factors to be considered are: conditions of the target market, extent of competition on the market, and market requirements for the product. (Cavusgil et al. 2012, 402-404; Hollensen 2012, 202-207.) Both approaches must correlate with its fundamental view on the overall structure of the larger economic environment, which consists of the: 1) external macro-level, 2) industry-level, and 3) internal firm-level (Cotis 2004). An exception is that instead of abroad internal firm-level focus, the firm's focus is more narrowly tailored to the product level.

Therefore, essential aspects of the external environment to be examined in order to make strategic decisions, which will lead to successful implementation of internationalization, are the:

- 1) macro-environment of target market
- 2) industry level of target market
- 3) external requirements on its products, set by macro-environment and industry

The goal of the research is to acquire information on the target market from the different market levels, namely, the geographical market level, the industry and industry segment level, and the product requirements level.

### 1.1.1 Case company

Due to strategic reasons case Company wished to remain anonymous and not to present detailed information about it in the research. Company operates in pneumatics field in Russia, St. Petersburg. It designs, manufactures, installs and provides service for three lines of pneumatic products for industrial and safety applications. From Soviet Union times Company supplied its products only to Russian, CIS' (Ukraine, Kazakhstan) and Baltic countries' (Estonia) geographical markets with only few (less than 5) sales abroad (Company 2014; Company 20 Dec 2013). Now it aims to develop its business by entering foreign markets in the EU region. Finland was selected as a target country for entering the western market, partly due to its geographical location and ease of access from the base country.

### 1.1.2 Product

The product selected as the candidate product to enter the new market is the Air Cannon System for industrial applications. Air cannon systems offer an effective solution to problems of material flow in the industries which production processes involve storage of bulk-materials in the storage vessels (metallic or concrete silos or bins) (figure 1). Systems are used for emptying the storage vessels from different types of stagnant bulk-materials (wood chips, meals, feeds, sand, ores) (figure 2).



Figure 1. Pellet silos, Versowood Oy, Vierumäki (Antti-teollisuus 2014)

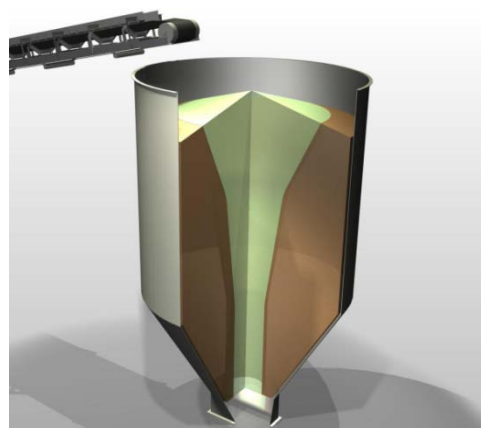


Figure 2. Discharge of the silo from bulk material (Lawrence Industries Inc. 2009-2013)



Due to the physical and chemical characteristics of the material, only a part of the material drops out instantly after outlet valve of the silo or bin is opened. The other parts of the material remain inside blocking the material flow. The most common types of blockages are: clinging (sticking to the sides), bridging, arching and rat-holing (figure 3). (Chicago Vibrator 2014; Flotec 2014; Roşca&Roşca2003, 50; Schmelzer 2008; Vibco 2014;Wamgroup 2014)

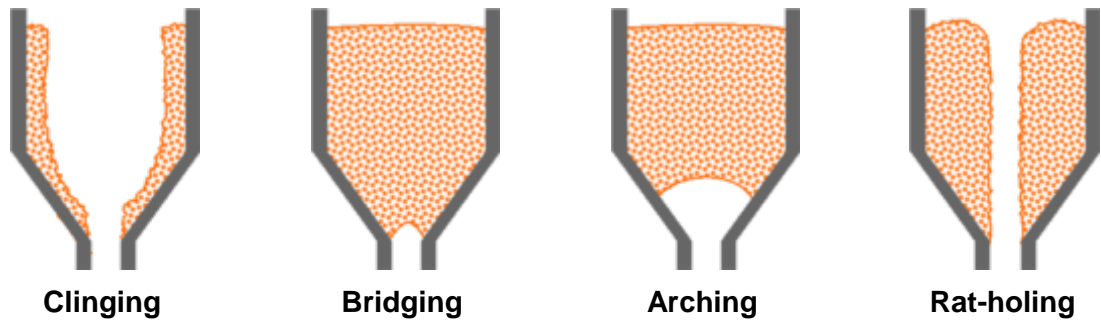


Figure 3. Common types of the material flow problems (Moritani 2014)

Material flow problems cause production lost and create extra costs such as: costly downtime, higher inventory costs, and expensive clean out (Chicago Vibrator 2014; Roşca & Roşca 2003, 50; Schmelzer 2008). Air cannon devices installed on the walls of the silo release compressed air or gas into the critical area inside the silo, which creates the explosion effect and breaks down build-ups and blockages resulting in a free flow of material (figure 4) (Chicago Vibrator 2014; Flotec 2014; Roşca&Roşca2003, 50; Schmelzer 2008; Vibco 2014; Wamgroup 2014).

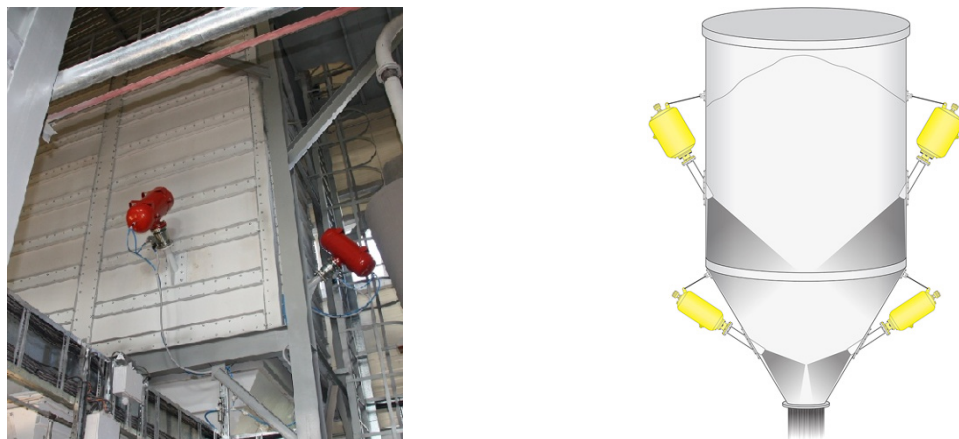


Figure 4. The blasts from the air cannons installed on the silo's walls affect the material and break the blockages (Company 2014; Chicago Vibrator 2014)

### **1.1.3 Air cannon applications**

Company's air cannon systems have been installed and utilized on the 710 plants operating in various industries such as:

- the food industry, including the baking, confectionery and dairy industries; bread, feed and sugar manufacturing
- the energy industry, including coal, peat and shale fueled power plants
- the construction industry, including cement manufacturing
- the chemical industry including fertilizer and chemical powders manufacturing
- the pulp and paper industry including furniture manufacturing and the building industry
- the mining industry (i.e. coal, metal and non-metal)
- the metallurgical industry, including ores and coal processing(Company 2014)

### **1.1.4 Intentions of the case company**

Company's goal in the long-run is to establish its presence in Finland by introducing its Air Cannon System product. Its current need is to develop a strategy for entering this new foreign market with its existing product. Company has to choose the appropriate method for entering the Finnish market, and decide whether the product meets the requirements of the market and has potential there or, alternatively, whether the product has to be adapted and repositioned for the Finnish market.

Concerning the choice of the market entry mode, Company is interested in gaining the knowledge of those aspects of new business environment which will help it to make a decision either to manufacture air cannon systems in Russia and export the product to Finland, or establish production of the product on the Finnish territory. At this stage, Company is interested only in gaining the information which will facilitate its making the decision between the export and FDI.

Development of the strategy requires analysis of detailed relevant information about the target business environment, i.e. concrete knowledge of certain aspects of the Finnish market of industrial air cannon systems. Company is interested in gaining knowledge of: a) relevant macro-environmental factors, b) pneumatic industry in Finland and its air cannons sector in particular, and c) product, i.e. the suitability of the air cannon systems to the target market and its responsiveness to the market requirements. From the current research Company intends to acquire only target market insight. Company prefers to conduct the analysis of its internal capabilities and financial aspects of internationalization separately and independently from the external factors and the present research. In order to develop the entry market strategy, Company will combine external and internal studies and make the final analysis of all aspects of internationalization on its own.

## 1.2 Scope of the research

The research problem lies in the inability of the Company to make the full range of decisions related to internationalization due to the lack of information and knowledge about structure, relationships and requirements of the Finnish market of air cannons. Company has intentions to internationalize by introducing the existing product to the new foreign market and benefit current marketing research in strategic decision making. Therefore, the goal of the research is to collect information that will enable strategic decisions and planning of the internationalization. Following that, the goal of the study is to conduct marketing research in three areas:

- 1) **the macro-environment:** to get knowledge on the macro-environmental factors of the geographic market that have impact on the air cannon system market and can affect the choice of the market entry mode (exporting or FDI)
- 2) the narrower **industry level:** to get knowledge of the air cannon sector of the Finnish pneumatic industry, its specific characteristics and structure, relationships, practicalities and ways of doing business within the industry, and factors driving the industry
- 3) **product suitability:** to get knowledge on the product qualities and attributes that ensure its success and demand on the target market.

**The research question** is: what are the external factors of the target market that have to be considered by the Company for successful entry into the Finnish pneumatic market with an air cannon systems product?

**The investigative questions** are aimed at acquiring more information on the opportunities of Company's air cannon systems on the Finnish market and translating the information into knowledge useful for strategic decision making:

**IQ 1. What market entry mode (export or FDI) is more convenient for expanding into the Finnish market with the air cannon system product, based on the external aspects of the business environment?**

This question is aimed at supporting the strategic decision on the market entry mode, i.e. the choice between export and FDI, taking in account macro-environmental factors of the target market.

**IQ 2. What are the specific characteristics / features of the target market in Finland?**

This question is aimed at describing the structure of the target industry sector, relationships between industry key players, and the value delivery process from both sellers' and buyers' perspectives.

**IQ 3. What characteristics and attributes of air cannon systems are required and valuable in the target market?**

This question is aimed at gaining insight for supporting its strategic decision on product suitability to the requirements of the target market and the possible need for adapting to the product for the target market.

By answering the research question and investigative questions this study will provide Company with efficient and useful tools for acquiring target market insight and knowledge of the domestic business practicalities. Tools were thought to be used for making successful strategic decisions regarding selection of entry mode and determination of Company's behavior on the market, which Company can benefit in the long-run.

### 1.3 Demarcation

Areas excluded from the research can be clearly illustrated through the process of assessment the global market opportunities presented by Cavusgil et al. (2012, 372-373). Evaluation of a firm's opportunities on the international market consists of 6 tasks that every firm should perform before internationalization. They concern gaining and analyzing the marketing information on (i) internal capabilities and resources of the firm that are needed to succeed internationally with its internal organization, and (ii) the external factors of the macro-environment. (Cavusgil et al. 2012, 372-373.) This thesis research is limited based on the character of the marketing information needed to be acquired to perform the tasks (table 1). Gaining and analyzing internal information is not in the scope of this study.

Table 1. Internal marketing information excluded from the research versus external marketing information within the scope of the research.

	Task	Information needed	Information type Internal /External	Part of the research Yes / No
1	Analyze organizational readiness to internationalize	Firm's strengths and weaknesses, financial and tangible resources, skills and competencies	Internal	No
2	Assess the suitability of firms products for foreign market	Foreign customer characteristics, laws and regulations, channel intermediaries, competitors' offerings	External	Yes
3	Screen countries to identify target market	Infrastructure for doing business, degree of economic freedom, country risk	External	Yes
4	Assess industry market potential	Market size and growth rate, trends in industry, degree of competitive intensity, standards and regulations,	External	Yes
5	Choose foreign business partner	Industry expertise of the potential partner, access to local distribution channels, technical expertise etc.	External	Yes
6	Estimate firm's sales potential	Pricing and financing of the firm, risk tolerance of the senior managers etc.	Internal	No

Since the product under study is technological equipment, examination of the pure technical issues when gaining information on the product qualities suitability is also a matter outside the scope of this study.

#### 1.4 Key concepts

Key theoretical concepts guiding the research are:

**Pre-internationalization** refers to the stages preceding planning and implementation of the firm's expansion into the international market (Hollansen 2012, 35). The core of the pre-internationalization process is that the firm, forced by stimuli from outside or inside, overcomes barriers hindering internationalization. Prior to the concrete actions towards internationalization, the firm acquires and uses information "to achieve enough relevant knowledge to initiate internationalization" (Freeman 2002 in Hollansen 2012, 35). After that starts the "internationalization ready" stage, the firm proceeds with actions that initiate the "internationalization trial" stage (Hollansen 2012, 35).

**Search and translation of the marketing information** is considered as "the most critical factor in the initiation of the internationalization process" (Hollansen 2012, 45). Managers become informed and aware of internationalization through acquiring relevant information from a number of sources and transforming it into knowledge. It reduces the uncertainty associated with the internationalization and ensures probability of its success. Effectiveness of this stage of the pre-internationalization process enables the following stages leading to the internationalization itself. (Hollansen 2012, 45.)

**Macro-environmental factors** are the larger societal forces that could have an impact on organization. External factors potentially affecting business activity of firms are: demographic, economic, natural, technological, political, social and cultural. (Armstrong & Kotler 2009, 97, 100-120).

**Industry structure** refers to not only other firms operating in the same industry, but to all industry participants, who influence the firm and shape its behavior in the business environment. Fundamental approach industry analysis states that industry structure comprises "Five forces": direct competitors, bargaining power of buyers, bargaining power of suppliers, manufacturers of substitutes and threat of new entrants. (Porter 2004, 3-33.) Original theory suggests that all participants are in competition with each other (Porter 2004, 4). Later researches indicated collaboration as well as balancing between cooperation and

competition as a base for a strategy beneficial for the firm in the long-run (Hollansen 2012, 80-81).

**Product suitability** means assessment of how product meets requirements set by circumstances of the international target market. It concerns the preferences of the target groups as well as the political, legal, environmental etc. requirements of the external business environment. (Bradley 2002, 14-16, 202-2014; Cavusgil & alt 2012, 385.)

## **2 Approaches for collecting marketing information**

In this chapter we present theoretical framework, which consists from theories aimed to give structure and support to the process of searching and translation of the information needed to cover three research areas: 1) macro-environmental factors affecting the target market and selection of market entry mode – export or FDI, 2) industry structure, 3) evaluation of the product suitability for the target market.

### **2.1 Macro-environment theories**

To cover the first research area and answer the IQ1, what external factors drive the target market, and what market entry mode – exporting or FDI – is more preferable and beneficial for the Company based on the external factors of business environment, we will use the framework of macro-environmental influences known as PESTEL and scenarios building method (Johnson & Scholes 2004, 65-71).

Scanning the business environment and examining its relevant aspects is the base and starting point for the researches with an international perspective (Armstrong & Kotler 2009, 484-491; Kottler & Keller 2009, 114-126). PESTEL analysis refers to political, economical, social, technological, environmental and legal factors influencing firms' business activity (Johnson & Scholes 2004, 65). These macro-environmental forces interact with each other creating new opportunities and threats for businesses (Kotler and Keller 2009, 114). Only listing of PESTEL factors limits the value of the approach. More important is to identify a number of key drivers of change which are likely to affect both the geographical market as well as the target industry. (Johnson & Scholes 2004, 69.) Accordingly, this thesis research will emphasize only aspects which seem to have an obvious concrete impact on the case under study.

Screening countries for export or FDI is mandatory part of the internationalization process and a necessary step of the global market opportunities assessment model presented by Cavusgil & al. (2012, 372-385, 411). Both, exporting and FDI, require examining the nature of the general business environment taking into account such criteria as government stability, the political situation, economic prospects, financial risks, relevant social and cultural phenomena, technological trends, environmental issues and legal requirements (Cavusgil & al. 2012, 377-383). FDI is usually associated with the long term investments (Cavusgil & al. 2012, 383). Due to the long term prospects and expected substantial returns, prediction of the target market growth and its development direction becomes a vital part of internationalization strategic management. The scenario method allows examina-

tion of how PESTEL factors will possibly shape the target market in the future. Awareness of the possible future scenarios and risks, in turn, reduces the likelihood of failures in strategic decision making.

A scenarios building technique is used in order to evaluate those aspects of the macro-environment, which are the highest level of uncertainty and can affect significantly the direction of strategic planning. Scenarios refer to assumptions related to the possible future development of the organization impacted by the key drivers of market change (Johnson & Scholes 2004, 76-77). The scenario approach is also compared to the “simulations of some possible futures” (Joint Research Center. European Commission 2006). Used as an exploratory method and a tool for decision making the scenario must be plausible (must look like it might actually happen), consistent (logical with no exception), utilizable for decision making (“contribute specific insight” into the future) (Joint Research Center. European Commission 2006). Thesis research uses scenarios for building possible future prospects of the market driven by political and economical forces. Moreover, political and economic factors of home and host countries seem like the matters of the greatest uncertainty.

### **2.1.1 Political factors**

Hollensen (2012, 119) sees the political environment consisting of two dimensions: the home country environment and the host country environment. In between these two environments is the general international environment including certain political and legal barriers. Cavusgil & al. (2012, 227-229) describes political risks hidden not only in the host country, where the firm targets to enter, but in its home country as well. Political uncertainty relevant to the case study is not related to the host country. Finland is considered as politically stable country with an environment suitable for doing business. The country is known for its positive attitude towards foreign companies, which brings investments and expands the Finnish labor market. Its relatively small bureaucracy and ease of practicalities also attract international businesses. Russia, on the other hand, has a reputation of being an economically unstable country with complex legal and political landscapes. It has great potential for business but at the same time is extremely risky due in part to its highly bureaucratic culture. (Tiri 2012; Cavusgil & al. 2012, 209.)

Macro-environmental scanning for this research was conducting mostly during the autumn of 2014. By that time, Russia had already started be actively involved in the political conflict in Ukraine which itself started in November 2013 when then-president of Ukraine refused to sign the trade and political agreement that committed the country to follow certain



European values and principles. This led to protests by EU oriented reforms supporters and the fall of president Yanukovych in the "Euromaidan Ukraine revolution". Russia has played an active role in the conflict by supporting groups against the new Ukraine government, which in turn help create the so called pro-Russian unrest. Eventually, the Crimean region of Ukraine was annexed by the Russian Federation. (Wikipedia a.) In response to the Crimean crisis a number of governments led by the US and EU issued sanctions on Russian individuals and businesses in March 2014. The scope of the sanctions were increased two times due to the further aggravation of the conflict. Among other restrictions, all supplies of equipment, technology and assistance to the Russian oil sector were prohibited. Russia, in turn, responded with sanctions against some American and Canadian individuals, and in August 2014 issued a ban on food imports from the EU, United States, Norway, Canada and Australia. (Wikipedia b.)

### **2.1.2 Economical factors**

The global economy is strongly connected to the global political environment and depends on what is happening in the political arenas worldwide. The economic systems of countries are influenced by the political decisions of governments. (Cavusgil et al. 2012, 216-217.) According to the Bank of Finland Bulletin 5 (2014, 17), political conflicts not only between Russia and Ukraine, but also in the Middle East and North Africa and uncertainty in the direction of their development are seen as risks that could affect the world economy via many different channels.

Besides the obvious negative impact of the Ukrainian conflict on the Russian economy, it has affected also economical situation in Finland, as the Finnish economy has also been always, at least partly, depending on Russia. Trade restrictions of the world community against Russia and Russia's response have definitely influenced how Russian and Finnish business sectors interact. Research by the Finnish-Russian Chamber of Commerce made in the autumn of 2014 (Tiri 2014) has shown an increase of political risks in Russia and a reduction of general business activity, including the import and export business between Finland and Russia.

Company and the product under this study are not directly targeted by the sanctions and bans as they are<sup>1</sup>. However, we assume that political relations between Russia and the rest of the world including the EU more likely affect business processes especially related

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<sup>1</sup>List of sanctions and restrictions is published by the Ministry for Foreign Affairs of Finland (2014).

to the movement of goods across the Russian border, and hamper export and import of goods at least in the near term.

### **2.1.3 Social-cultural factors**

The social-cultural environment of the target market refers to demographic factors, cultural influences, norms and behavioral patterns. Together these factors determine the preferences and attitudes of the potential buyers and influence their decisions to purchase (Armstrong & Kotler 2009, 117-119, 489-491; Bradley 2002, 91-95; Cavusgil & al. 2012, 130-131). Cavusgil et al. (2012, 133) underlines *stereotype* as one of several “analytical approaches to gaining deeper insights into the role of culture in international business”.

The social-cultural aspect is relevant due to the assumption that the Ukraine conflict may have worsened attitudes towards companies and business partners based in Russia and products of Russian origin. In Finland the reputation of Russia has been historically questionable and often portrayed negatively in the media. This partly explains negative stereotypes that may exist among some Finns and certain expectations they may possess regarding how they think Russians in general behave. The question is, how such general attitudes of the society affects the business environment, its B-to-B sector in particular, and how this impacts buyers’ decision making.

### **2.1.4 Technological factors**

The technological environment refers to the requirements and support of the technology development of the target market. Manufacturers have no choice, but to update their products to new technologies in order to keep their market positions and to avoid their products being replaced by newer technologies. (Armstrong & Kotler 2009, 113-114.) Bradley (2002, 140-141) emphasizes that technology development could be driven also by the requirements of the law and product quality standards.

Insights into the technological environment of the target market is essential for the Company because of the differences in technological requirements of the domestic market and very little authorities’ control of them. In Finland case product – air cannon systems – is categorized as pressure equipment<sup>2</sup> (Act on Pressure Equipment; Pressure Equipment

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<sup>2</sup>According to the Pressure Equipment Directive 97/23/EC, pressure equipment is defined as “components and assemblies (steam boilers, pressure vessels, piping, safety valves and other) subject to pressure loading with volume generally over one liter in volume and maximum pressure more than 0.5 bar gauge”.

Directive 97/23/EC). Product quality and safety standards of the pressure equipment have been harmonized across EU member countries and they are obligatory to follow.

### **2.1.5 Legal factors**

Legal risks could be produced by home and host countries' legal systems (Cavusgil et al. 2012, 224-227). Legal issues arising from the host country side could be related to the laws businesses are subject to when operating in the European Community (Bradley 2002, 140-141). In Finland, placing on the market, locating, use, inspection and supervision of pressure equipment is regulated by several statutes of the Ministry of Employment and the Economy, which have been harmonized with the relevant EC laws (Ministry of employment and the economy 2010).

From the Russian side, legal risks might appear in relation to complexity of export procedures when considering Russia as the place of production of the air cannon systems. Russian customs regulation is known for its bureaucracy, which would make the export of finish air cannon systems to Finland challengeable.

### **2.1.6 Environmental factors**

In general, the approach to environmental issues seems to differ in the home and host countries under study. In Russia they are not considered as significant as compared to commercial aspects. In Finland, on the other hand, environmental restrictions are impacted by EU legislation, obligatory and taken very seriously. In the EU, environmental factors are usually connected to legal risks, since companies must follow strict recycling regulations, recycling product packaging; combat pollution, and ensure health and safety (Cavusgil & al. 2012, 225). Applying to the study case, environmental issues are assumed to be relevant in relation to: a) impact of the case product on the environment, b) environmental requirements of the industry, and c) energy saving.

## **2.2 Industry structure and relationships analysis**

Although the environment relevant to the firm is very broad and influenced by political, legal, technological, social and economic forces, its key aspect is the industry, in which the firm operates. When answering the IQ2 concerning specific characteristics and features of the target market on the industry level we will refer to the structural approach to the industry analysis using fundamental theoretical models of industry structure known as the Five Forces (Porter 2004, 3-33). Michael Porter's Five Forces model gives an overview of the elements comprising the industry and the nature of the relationships between

them. The model is known for its universality, and appears to be convenient for the industry of pressure equipment and its air cannon sector, because it proved to be applicable to any industry. (Porter 2004, 4.) Although the Five Forces approach has been criticized, it still works as a starting point and a base for further theoretical discussion. Researchers generally agree with the elements of the industry structure offered by Porter, but have different opinions on the source of dynamics between the elements.

Porter (2004, 5) has defined industry as a “group of firms producing products that are close substitutes to each other” (Porter 2004, 5). However, in his Five Forces theory he extends the industry structure beyond direct competitors and includes into it other participants in accordance with the economic structure underlying the industry: firms, which are new entrants to the industry, suppliers, buyers and producers of substitute products. Competition in the industry concerns not only rivalry between direct competitors, but all participants of the industry compete with each other and influence all firms operating in the industry. From that point of view every firm operating in the industry is influenced by five external forces: threat of new entrants to the industry, bargaining power of suppliers, bargaining power of buyers, threat of manufacturers of substitute products, and rivalry among direct competitors of the market (figure 5). (Porter 2004, 3-33.)

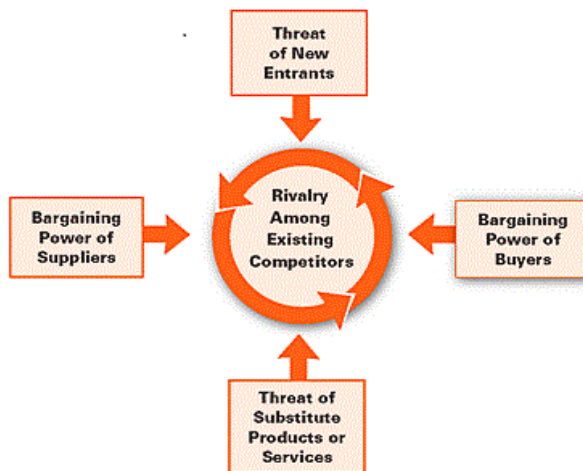


Figure 5. Five forces determining state of competition and profit potential in an industry (Harvard Business Review 2008)

Porter (2004, 3) states that together the five forces “determine the ultimate profit potential in the industry, where profit potential is measured in terms of long run return on invested capital”. All firms influenced by these external forces are basically on the same level. Key to success and a condition for out-performing other industry players lies in the founding firm’s “differing abilities”. (Porter 2004, 3.) The goal of every firm is “to find a position in the industry where the company can best defend itself against these competitive forces or can

influence them in its favor”, and emphasizes the importance of knowledge and understanding of competitive forces for developing a competitive strategy (Porter 2004, 4). Therefore, the five major forces structure every industry and competition is the base of interaction between all industry participants.

The five sources model presented by Burton (1995, in Hollansen 2012, 80) is an alternative to Porter’s Five Forces theory. Although it consists of the same elements, instead of competition being the base of interaction between direct competitors, suppliers, buyers, substitutes and new entrants as in Porter’s theory; Burton suggests collaboration to be the base for building relations within the industry.

A similar structure lies at the base of the international marketing system suggested by Bradley (2002, 43-47). Bradley (2002, 43) also identified five major participants groups. Besides the firm itself, the international marketing system includes customers, competitors, partners, and suppliers. In this system, a firm builds and sustains relationships with all other participants in the home country and abroad and also copes with the international marketing environment influenced by cultural, economical and political factors (figure 6). (Bradley 2002, 43-44.)

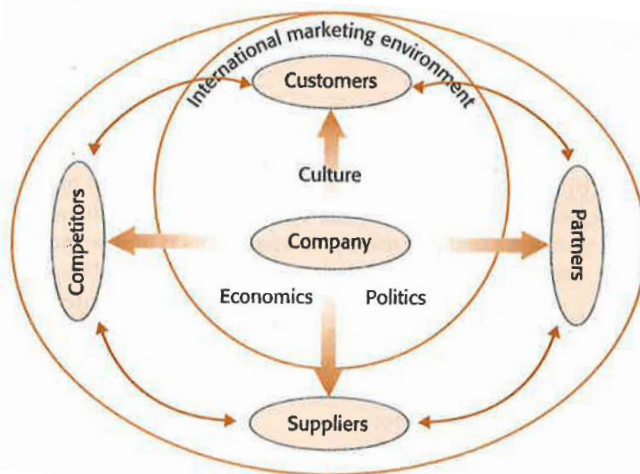


Figure 6. Participants and external influences of the international marketing system (Bradley 2002, 44)

The position of the firm within the international marketing system is determined by its strategic orientation. Depending upon the chosen strategy, a firm can focus either on customers or on competitors in order to win customers at the expense of rivals. (Bradley 2002, 44-46.)

Therefore, based on the approaches discussed, elements of the industry structure remain mostly unchangeable, while position and behavior of the firm within the industry change depending on the firm's choice of the type of relationship with other industry participants. Relationships with industry players could be driven by competition, collaboration or an attempt to incorporate both into the strategy of the firm.

### 2.2.1 Competition

Porter (2004, 3-33) sees competition as being the driving force of interaction between the industry participants. He also suggests the framework for analyzing competitors, advising to investigate not only existing competitors but potential ones as well. His framework consists of four components and is based on the key aspects of a competitor: future goals, current strategy, assumptions and capabilities (figure 7). Goals and assumptions are what drive the competitor, and strategy and capabilities are what the competitor is doing or can do. Understanding these components and answering related key questions makes it possible to predict how a competitor may act in the future and help a company form a competitor's response profile. (Porter 2004, 48-50.)

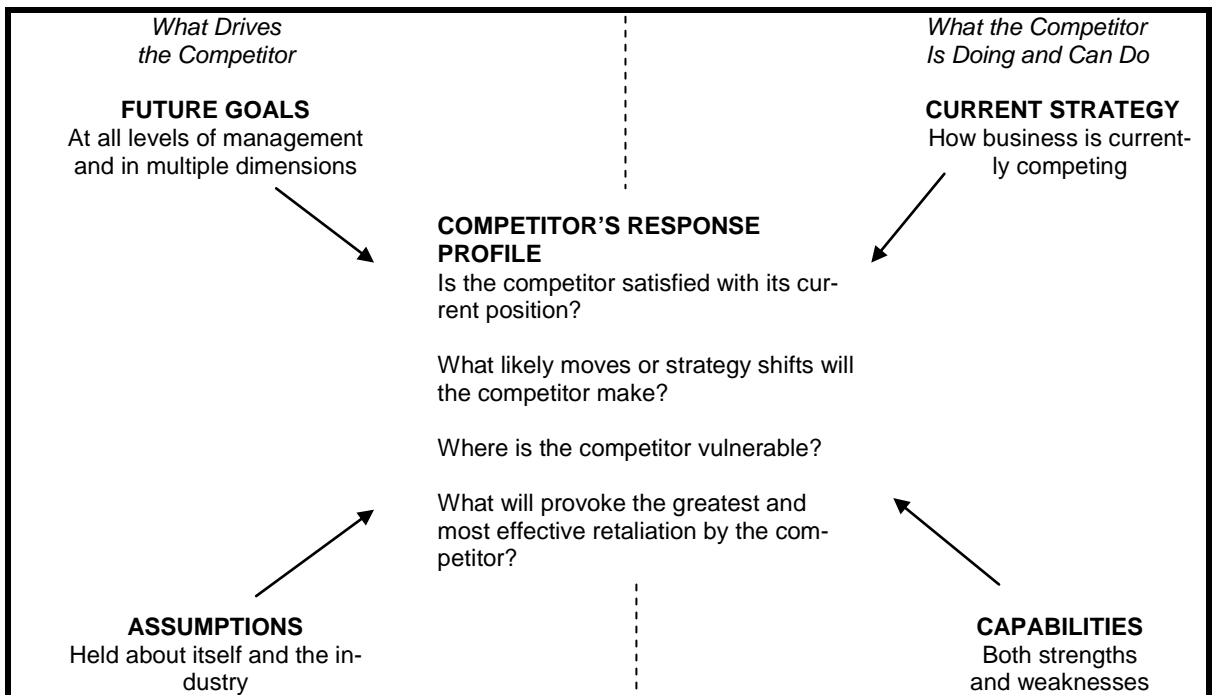


Figure 7. The components of a competitor analysis forming a competitor's response profile (Porter 2004, 49)

### 2.2.2 Collaboration

An alternative model to competitive theory is a model that views industry participants “as five potential sources for creating collaborative advantages in the industrial environment of the firm” (Hollansen 2012, 80). Where Porter sees competition, Burton (1995, in Hollansen 2012, 80) discovers potential for cooperation and partnering:

1. Rivalry among **direct competitors** has a potential for horizontal collaboration with the firms operating at the same level of the value chain i.e. producing same product with similar production processes.
2. Bargaining power of **suppliers** can be turned into vertical collaboration with suppliers of components or services.
3. Bargaining power of **buyers** meaning partnering arrangements with intermediary channels or customized projects with end-users.
4. Manufactures of **substitutes** usually are not considered as potential partners. However, cooperation is still possible on side of both complements and substitutes.
5. **New entrants** are prospective partners for especially diversification alliances. Firms from previously unrelated sectors with the potential of “blurring” industry borders and cross-industry collaboration start to cooperate in totally new industry market. (Burton 1995, in Hollansen 2012, 80.)

### 2.2.3 Balance

Hollansen (2012, 80) notes that “the real strategic problem for all firms is to decide when and how to collaborate, and in what situations to compete”. The choice is never one sided. Right and effective strategic choice would be the “combination of competitive and collaborative strategies appropriate to the industry circumstances, which lead to optimization of firm’s position and make use of both collaborative and competitive advantage”. In order to utilize both strategies to the full extent, a firm has to develop competitive and collaborative policies aiming to achieve balance between competition and collaboration. It needs to avoid conflicts between them in each element of the industry structure – policies towards direct competitors, customers relations, suppliers, management, relations with substitutes manufacturers, and new entrants. (Hollansen 2012, 80-81.)

## 2.3 Product suitability

To answer IQ3, which regards attributes and features of the product valuable on the target market, we will use the product suitability approach and refer to competitive advantage theory.

Offering of the existing product abroad is considered as the simplest internationalization strategy (Bradley 2002, 14). However, the process of developing successful product markets is not that simple and requires careful planning. One of the characteristics of the product, which more likely will have potential on the foreign market, is its sales in the do-

mestic market, especially if there are similar needs and conditions existing in both markets (Cavusgil & alt 2012, 376). However, the successful sales of a product in the domestic market do not guarantee the same international performance. Usually the firm must adapt its product and sometimes even its technology in accordance with specific geographical and industry markets insight. It must take into account unique customer requirements and preferences, as well as standards and regulations affecting the industry. (Bradley 2002, 14-16; Cavusgil & alt 2012, 385.) Once it is decided to internationalize, it is important to determine the suitability of firm's product for the new market (Cavusgil & alt 2012, 385).

Air cannon systems subject to this research are considered as an industrial product oriented to the B-to-B sector. Approaches to assessment of the suitability of consumer products and industrial products to the requirements of new market are different. Bradley (2002, 206) draws the strict line between two types of products emphasizing the complexity of the industrial market and processes involved. Further we examine the 'suitability' concept in relation to the quality, process and suppliers of the industrial products.

### **2.3.1 Quality**

The concept of quality of industrial product differs from the concept of quality of consumer products. Industrial markets quality is defined in accordance to patterns and standards used in the industry. Because patterns and standards might be different in different countries, the same product can be classified in each of those countries as a different quality. (Bradley 2002, 209.)

Another feature of the industrial products is that they are purchased for business use, to be a part of the buyer's business processes. Industrial products usually have direct impact on buyer's business output. That is why besides quality of the product itself buyers expect also certain level of: service, dependability, performance and cost. (Bradley 2002, 208-209.)

### **2.3.2 Process**

Unlike consumer products, industrial products are usually driven by technologies that make them tightly related to such functional areas as manufacturing, R&D, inventory control and engineering. This may mean that while internationalizing a firm must transfer abroad not only the product, but also functional relationships as mentioned above in order to enable production of the product.(Bradley 2002, 206.) Therefore, due to the nature of the industrial product not only the product itself but also stages of its production need to be examined for suitability with the target foreign market.



### 2.3.3 Supplier

Company is positioned as a supplier toward buyers and end-users of the case product. When entering a foreign market with a new product it is advisable to check the target market requirements against the performance of supplier himself and evaluate supplier's suitability for the potential buyers. According to the stages of the buying process in industrial market described by Bradley (2002, 211-215) buyers identify suppliers based on their reputation, technical specifications and delivery terms. However, selection of suppliers is done on the basis of an assessment of his business activity as a whole. Criteria of the suitable supplier are: marketing and financial capacity, service, maintenance and financial capabilities, distribution and delivery capacity (figure 8). (Bradley (2002, 214.)

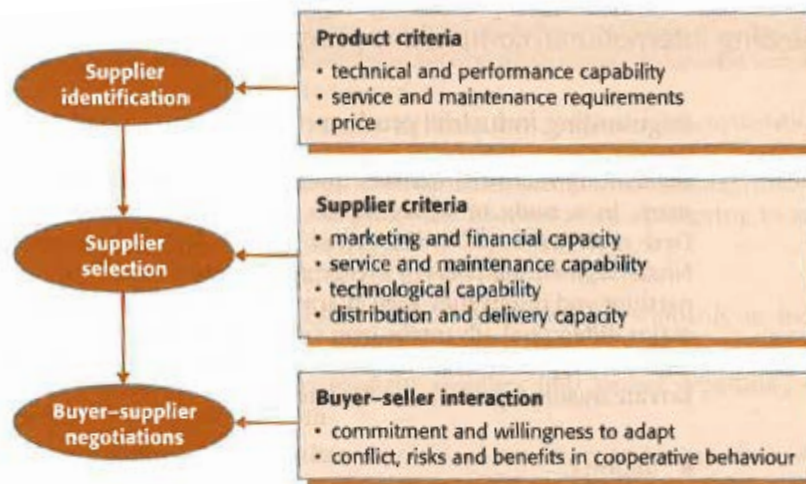


Figure 8. Supplier criteria used in the buying stages in industrial market (Bradley 2002, 215)

Nowadays, a common practice on buyers' side is to issue company's official requirements to its suppliers and strict criteria for their selection. Usually they are regulated either by internal rules of the company or quality systems of the company.

### 2.3.4 Competitive advantage

In order not only to meet the requirements of the foreign market but to compete with similar offerings, firms need to develop and sustain competitive advantage that strengthen their positions in the market. Porter's (1998) concept of competitive advantage refers to a complex of attributes that allows the firm to outperform the competitor. Profitability of the

firm depends on its positioning either above or below industry average. The better the firm succeeds in positioning itself in the industry, the higher rates of return it gets. Above-average performance, when firm's profit exceeds the average of the industry, indicates that firm has a competitive advantage over competitors. (Porter 1998, 11-12.) There are two basic types of competitive advantage: cost (Porter 1998,62-63) and differentiation oriented(Porter 1998, 119-120). Only differentiation approach will be applied in this study to support examining of the air canon system –product potential in the Finnish market, since all finance and cost related issues were demarcated and left outside the research.

Differentiation advantage refers to the values delivered by the firm that exceed the offering of competitor's. Strategies based on differentiation are aimed to provide such a variety of products, services, or features that competitors were not yet offered, or are not able to offer. (Porter 1998, 119.) Bradley (2002, 208-209), on the other hand, emphasizes another specific feature of the industrial product that most often it needs to be complemented with supplementary services, e.g. product maintenance, repair and logistic services. Product quality then covers not only the physical product, but the combination of the product and essential supporting services. Customer satisfaction becomes the criterion for measuring the level of quality. (Bradley 2002, 208-209.)

### **3 Methods for market external factors research**

The exploratory approach was adopted to gain insight to the target business environment and answer the research question. Exploratory design was chosen as appropriate due to minimal knowledge of the target market and absolute lack of knowledge of some of its aspects (Burns & Bush 2010, 144-146). Secondary data analysis and qualitative research method were used for conducting exploratory research (Burn & Bush 2010, 146-147). Qualitative research was chosen because it serves the purpose of the study, namely a richer and deeper insight of phenomenon under study using small size population samples.

#### **3.1 Data collection**

Secondary and primary data has been collected in order to obtain comprehensive information on the research topics and translate it into knowledge of the different levels of the target market.

Sources used for collection of secondary data, i.e. data collected for other than current research purposes but relevant to the research objectives (Burns & Bush 2010, 146), are: 1) companies' web-pages, 2) companies' product brochures or other materials, 3) articles on the external environment phenomena, 4) documents issued by official authorities, 5) technical standards and regulations.

Primary data was collected through semi-structured interviews as a method of qualitative research data collection (Burns & Bush 2010, 249-250). There were two types of interviews conducted depending on sub-goals of the research: 1) interviews to support the study of the secondary data, and 2) main interviews resulting from theoretical framework of the research.

#### **3.2 Supporting interviews**

Short (from 10 to 15 minutes) unstructured interviews usually consisted from 1-3 questions were conducted to support secondary data collection and complete information acquired through secondary sources. Matters remained unclear due to the insufficient information presented in secondary data were clarified via telephone interviews or e-mail conversations with authorities assumed to own complete understanding of the subject. List of authorities is presented in Table 2 (appendix 1). There was no interview guide used, because of the simplicity of the interviews, and their purpose to get answers on very particular questions.

### 3.3 Main interviews

Main interviews were designed utilizing theoretical views on the industry level of market structure presented in subchapter 2.2. The population under study was defined in accordance with the industry structure as it is presented in Five Forces industry structure model (see Sub-chapter 2.2; Porter 2004, 3-33), and further developed in Five sources model (see Sub-chapter 2.2; Burton 1995, in Hollansen 2012, 80) and International marketing system (see Sub-chapter 2.2; Bradley 2002, 43-47). Air cannon sector of the pneumatic industry in Finland was divided into five groups constituting the model: 1) direct competitors, 2) manufacturers of substitutes, 3) buyers, 4) suppliers, 5) new entrants to the industry. Interviewing representatives of all groups was assumed to give an overview on the whole target industry. All five groups formed the target population of the research (table 3). Each group was sampled and only few representatives of the target population were selected. Size and nature of the samples of each group were determined based on the characteristics of the group or specific interest of the Company. Principles of sampling were different for each group. Interviewees were chosen from Finnish companies.

Table 3. Interviewees selected from industry participants' groups

	Industry group	Interviewees
1	Direct competitors	Manufacturers of air cannon systems in Finland and Finnish companies, which import air cannon systems of foreign manufacturers to Finland. Due to the small size of this group on Finnish market: only one Finnish manufacturer and few Finnish importers. Sample contained from 3 companies: one manufacturer and two importers.
2	Manufacturers of substitute products	Manufacturers of substitute products, which compete with air canons providers on the level of technical solution for solving potential buyers' problem. Sample was limited to 1 company.
3	Buyers	End-users of the air cannon systems from most developed or potential industries in Finland, i.e. plants, factories. Sample was limited by the number of industries considered as most potential and contained 3 companies.
4	Suppliers	Suppliers of components and raw materials used in production and service of the air cannon systems. Sample was limited by the particular component, which was considered as most critical and demanding in terms of quality, complexity and importance in production of air cannon systems. There were 2 supplier companies interviewed.
5	New entrants	New entrants to the industry i.e. manufacturers of air canon systems planning to expand to Finnish market of air cannon systems. Commissioning company was interviewed for this purpose.

There were 10 interviews conducted altogether including interview with the Company itself. List of the interviewed companies is presented in Table 4 (appendix 2).

### 3.4 Interview guides

Interviews were conducted using interview guides (appendixes 3, 4, 5 6, 7, 8). Interview guides for all interviewees groups except New entrants and Substitutes were made in Fin-

nish, as the interviews were conducted in Finnish, and translated to English afterwards to present them in the research. Interview guides in original language are in appendixes 3 a, 4 a, 5 a, 6 a.

Interview guides were designed on the basis of the frameworks concerning the types of relations within the industry – competition, collaboration and balance. Competitor analysis framework discussed in the Sub-chapter 2.2.1 was, however, the main source for developing the structure of the interview guides aiming to cover the current situation of the companies and assumptions of future development.

Interview guides for all five industry groups followed a similar structure but their content was particularly adapted for each group. Measuring questions were made for each group specifically and grouped into five topics considered relevant and necessary for the research:

- 1) interviewed company's background and position on the market
- 2) relationships: competition vs. collaboration
- 3) market structure
- 4) product
- 5) forecasting of market and interviewed company development

Most of the interviewees were approached via telephone. Some of the interviewees wished to receive an interview guide by e-mail first and get familiar with the questions. After that interviews were conducted through telephone or e-mail conversations by choice of interviewee. Part of the interviewees was interviewed face-to-face on The Northern Industries fair held in Oulu, Finland, on 21.-22 May 2014.

### **3.5 Ethical issues**

All interviewees were aware about the purpose of the research formulated as an "overview on the current and future situation of the market of industrial air cannons in Finland". The interview guide for competitors' sector were made from general questions, aiming not to search for the information usually secret for the companies operating on the same supply chain level. Names of the interviewees are not presented in the research as per wish of the interviewed participants of the research.

## **4 Presentation and analysis of the research information**

As it was stated in theoretical framework discussion, relevant information on the external environment is to be considered by the Company before strategic planning of the interna-

tionalization and entering Finland as a target market. Knowledge of target market characteristics and requirements incorporated into the analysis of the internal capabilities of the Company is mandatory when setting managerial goals and making strategic decisions in order to plan and implement consecutive steps of the internationalization process.

Building up marketing information starts from presentation of the macro-environmental factors aiming to guide Company in the dilemma, where to manufacturer case product – in home or in host country, and help to make a decision on the market entry mode between exporting and non-export modes. The research shows characteristics of the target market from the narrower level focusing on the air cannon industry, and examining its structure based on the qualitative research conducted on the participants of the Finnish air cannon sector. In the final part we present the results of the same qualitative research concerning macro-environmental and industry requirements towards the case product and the level of suitability of Company's air cannon systems to Finnish market.

#### **4.1 Market entry mode considerations**

In the upcoming sub-chapters we highlight the macro-environmental aspects advised to be considered by the Company before making a decision on the market entry mode. As it was stated earlier, goal of the research is only to facilitate Company's choice between export and FDI entry modes. Since Company has functional production of air cannon systems in Russia, practically it has to decide either to continue manufacturing of the products in Russia with the further export, or transfer production to Finland.

Since Company operates in Russia, it owns information and knowledge on home market, and the market situation is more or less clear and apprehensible. Therefore, Company does not need the marketing information on the macro-environment of the Russian market unless it has significant impact on the macro-environment of Finnish market.

##### **4.1.1 Economical and legal factors influenced by political issues**

At the moment there are no signs of Russia willing to negotiate and compromise concerning the Ukraine conflict. There is no evidence that the Russian-Ukrainian situation will be improved significantly in the near term. Contrariwise, conflict between Russia and the world community is assumed to get worse. As far as it continues, Russia will be threatened by new sanctions, which most likely would have a devastating impact on the Russian economy. (The Economist 2015 a.) The country already lives through an economic crises: in the first two weeks of year 2015 the ruble fell 17,5 % against the dollar, inflation

has almost doubled, the price of the oil – main export of Russia – has decreased significantly, and GDP is expected to contract between 3 % and 5 % during the current year 2015.(The Economist 2015 b.) Inflation is predicted to grow because of the weaker ruble and Russian restrictions on western food imports. A deep fall in investments is expected due to the tight monetary policy and weak business sentiment. In case of the prolongation of sanctions for several years oil output could be significantly impaired. (The Economist Intelligence Unit 2015 a.)

Economic decline in Russia and EU-Russian trade sanctions are affecting domestic growth prospects in Finland (The Economist Intelligence Unit 2015 b). It is resulting in a reduction of Finnish exports. Positive for the world economy, oil price reductions are not good for Finland - since it negatively affects the Russian economy, and, in turn, reduce Russian imports from Finland. (Bank of Finland Bulletin 5/2014: Economic Outlook, 17.)

The recession in the Russian economy has shown in the deterioration of the growth rate of Finland estimated in 2012. According to the forecast of the Bank of Finland (Kilponen, Kinnunen & Mäki-Fränti 2014, 67), the growth potential of the Finnish economy will remain weak due to “the prolongation of the recession, accumulation of public debt and ageing of the population”. Over the next 25 years the potential output growth of Finland is expected to be less than 1 %. (Kilponen, Kinnunen & Mäki-Fränti 2014, 67.) However, for the near term a slow recovery of Finnish output is predicted in 2016 after a moderate contraction in 2015(Bank of Finland Bulletin 5/2014: Economic Outlook, 17).

#### **4.1.2 Export and import issues**

Russian customs regulations have been always known for its deliberate complexity and bureaucracy (Tiri 2012). Handling of import has worsened lately due to the contra-sanctions of Russia on western imports. Russian customs has strengthened inspections of the imported goods, which reflects in longer time for customs clearance, and tightened the customs rules towards more bureaucracy (Rosbalt 2014). In the beginning of February 2015 Russia has restricted the import of mechanical engineering components for needs of the government (RIA 2015). Combining with the technological bans of EU, US and other countries (Panin 2014) it might show in the scarcity of imported technological components on the manufacturing side in Russia.

Export procedures of technological components and equipment have been always demanding in terms of permissions and certificates to be received for each single delivery (Elektronika 2003). However, there is no evidence of the deliberate tightening of the ex-

port rules in relation to the sanctions and trade bans. Customs broker Logistika Service operating in Russia stated:

“There is no any additional requirements on export of technology equipment appeared since sanctions were set” (Logistika Service 15 Jan 2015).

Export of the case product (customs tariff code 8424) is not under any restrictions. It was confirmed by Logistika Service (15 Jan 2015) and Finnish Customs (15 Jan 2015).

#### **4.1.3 Finnish laws and regulations of the pressure equipment**

Design and manufacturing of the pressure equipment are regulated by EU standards set in the Pressure Equipment Directive 97/23/EC and Simple Pressure Vessel Directive 2009/105/EC. Finnish laws concerning pressure equipment are harmonized in accordance with corresponding EC directives. (Ministry of Employment and the Economy 2010.)

National surveillance of the sector in Finland is Tukes – Finnish Safety and Chemicals Agency (Act on Pressure Equipment (869/1999)). The purpose of Tukes is to protect people and the environment from any safety risks. Tukes is assigned to supervise and promote the technical safety and conformity in various industries in Finland including the pressure equipment sector. Tukes supervises products, services and production systems and enforces the relevant legislation. (Tukes2015.) According to Tukes (2014), the safety of pressure equipment is promoted by “monitoring compliance with the pressure equipment statutes, disseminating information, providing training and taking part in research and development”.

Essential official Finnish and EU statutes and guides of the pressure equipment sector to be followed are listed in appendix 9.

#### **4.1.4 Technological requirements to the pressure equipment**

According to the Article 2, Paragraph 6 of the Decision of the Ministry of Trade and Industry on Pressure Equipment (938/1999) harmonized with Article 3, Paragraph 3 of the Pressure Equipment Directive 97/23/EC, all pressure equipment placed on the EU market is divided into four categories I-IV. Depending on the category there are different safety requirements to be fulfilled before placing equipment in the EU market. Pressure equipment, which does not belong to any of these categories, belongs to its own group meaning that it has to be “designed and manufactured in accordance with the sound engineer-



ing practice of Member State” (Article 3, Paragraph 3 of the Pressure Equipment Directive 97/23/EC).

Each category (I, II, III, IV) refers to one or several conformity assessment modules, i.e. procedures required to prove that pressure equipment placed on EU market conforms to EU standards. To be able to recognize conformity assessment procedures required to the air cannon systems it is needed: 1) to identify a category of the equipment, 2) to identify applicable module or combinations of modules.

Categories I-IV to be identified through the Conformity assessment tables 1-9 presented in the Annex 2 of the Pressure Equipment Directive 97/23/EC and the Attachment 2 of the Decision of the Ministry of Trade and Industry on Pressure Equipment (938/1999). Each table is designed for classifying a different kind of pressure equipment. In order to identify the right category for Company’s products, it is necessary to identify the appropriate table based on the following data of the equipment<sup>3</sup>:

- 1) type of the equipment – vessel or piping; fired or not; is there risk of overheating or not; reaction on a temperature greater than 110 °C
- 2) maximum allowable pressure (PS); volume of the equipment (V)
- 3) group of fluids for which equipment was intended – gas or liquid
- 4) danger of the fluid (Attachment 2 of the Decision of the Ministry of Trade and Industry on Pressure Equipment (938/1999); Annex 2 of the Pressure Equipment Directive 97/23/EC)

Based on the characteristics of the Company’s air cannon systems the appropriate conformity assessment table number 2 presented as a figure 9 (appendix 10). Applying the dimension of the Company’s air cannons to the limits of categories I-IV indicated in the table we classify the range of Company’s air cannon systems under study as:

- a) Category I
- b) Category II
- c) Pressure equipment designed and manufactured in accordance with the sound engineering practice of Member State (table 5 appendix 10)

Furthermore, category I refers to module A, and category II refers to combination of modules A1, D1 and E1. Conformity assessment modules corresponding with identified categories and their brief description in Table 6:

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<sup>3</sup>Detailed guidelines and step by step instructions of the identification of the appropriate Conformity assessment table are in appendix 11.

Table 6. Description of modules corresponding with the categories I and II (Annex III of the Pressure Equipment Directive 97/23/EC)

Category	Module	Module name and description
I	A	Internal production control. Manufacturer draws up the technical documentation and does the final assessment of conformity of pressure equipment with the requirements of the Directive, which apply to it.
II	A1	Internal manufacturing checks with monitoring of the final assessment. Manufacturer draws up the technical documentation and does the final assessment, which has to be monitored by notified body chosen by the manufacturer.
	D1	Production quality assurance. Manufacturer draws up technical documentation and operates a quality system for production, testing and final inspection, which is approved by the notified body of his choice.
	E1	Production quality assurance. Manufacturer draws up technical documentation and operates a quality system for testing and final inspection, which is approved by the notified body of his choice.

Notified bodies in Finland, which are accepted to monitor final assessments of modules and approve quality system, are listed in appendix12.

Pressure equipment of categories I-IV requires CE-marking and issuing of declaration of conformity. Manufacturers have to affix CE mark in a manner described in the Article 15 of the Pressure Equipment Directive 97/23/EC to the equipment of categories I-IV indicating that it meets the requirements of applicable directives of European Community. Manufacturers issue also Declaration of Conformity. Pressure equipment designed and manufactured in sound engineering practice of the Member State is not allowed to carry CE-mark, and does not have to be accompanied with Declaration of Conformity.(Pressure Equipment Directive 97/23/EC; Simple Pressure Vessel Directive 2009/105/EC.)

#### 4.1.5 Attitudes towards country of origin

The situation in Ukraine, sanctions of governments worldwide, and trade bans of Russia have definitely worsened the perception of Russia in Finnish society. According to the survey aimed to interview Russian speaking population of Finland, 65 % of the interviewees agreed that the Ukraine conflict has had a negative impact on the relationship between Finland and Russia, and 21 % thinks that attitudes have changed to worse lately (Heiskanen 2015).

In the business sector bias and negative attitudes towards Russian based companies and businesses is also very common. In many cases negativity is associated with the non-smooth business experiences related to red tape, problems with customs and other difficulties. (Wuorinen 7 Aug 2012.) All interviewed end-users of air cannons stated that they have nothing against the equipment manufactured in Russia, if it reaches EU standards,

meets all quality requirements and solve their problem. Conversely, no one believed in smooth cooperation with the supplier located in Russia. (Finnsementti Oy 17 Dec 2014; LKAB 22 May 2014; Savon Voima Oy 15 Dec 2014.)

#### 4.2 Air cannon market in Finland

Interviewed sellers of the air cannons stated that in Finland target market for them is comprised from all possible industries, which are concerned with the storage of the powdery or granular bulk materials, where the need for air cannon solution might arise (Pneuplan Oy 21 Nov 2014; Vibratex Oy 27 Nov 2014; WAM Finland 27 Nov 2014). However, it is in the interests of the Company to determine the most potential segments of the Finnish market in order to position itself on the market. Starting point for market segmentation is to overview the structure of the present Russian market where Company currently operates. .

Before the economic instability in Russia, the most profitable sector for the Company were: the baking sector of the food industry (39 % of sales), the energy industry (22 %) and the construction industry (15 %) (figure 10).

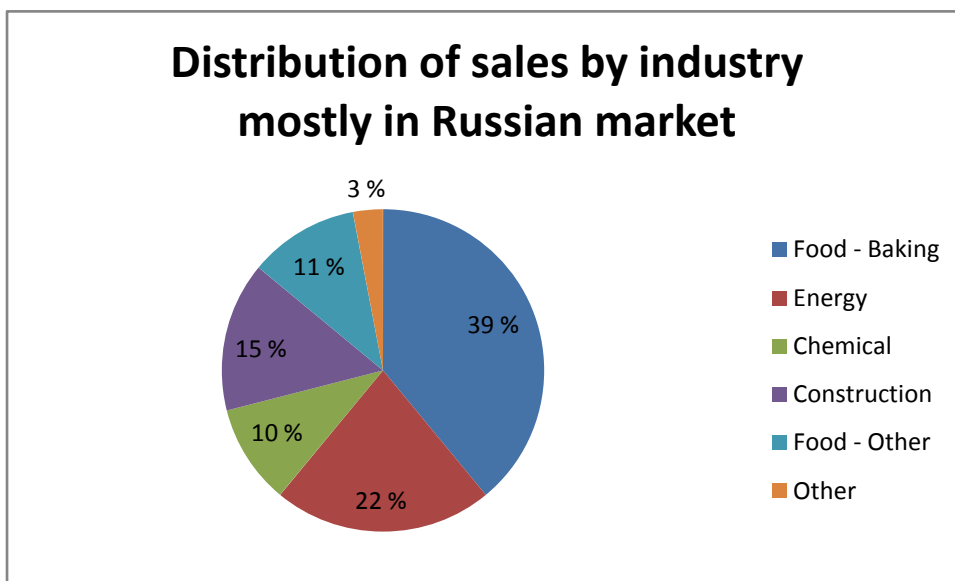


Figure 10. Case Company's sales of air cannons on Russian market by industry (Case Company 2014)

Obviously, the market situation and the mentioned figures will change due to the influences of economic changes in each particular industry. More likely, the political situation in Russia will affect the potential of industries and their further development, and rearrange the sales distribution of Company's air cannon systems between the industries.

The list of potential industries on the Finnish market of the air cannon systems is assumed to look differently depending on the general economic situation in the host country. Based on the intermediate consumption in Finland's national economy in 2012 the most consumed product group produced by the industries, which are potential users of air cannon systems, are: mining and quarrying industry, constructions, chemical, energy, food and metallurgy industries (table 7) (Statistics Finland 2014).

Table 7. The most supplied and used product groups of intermediate consumption by industries, which are potential end-users of air cannon systems, in Finland's national economy in 2012 (Statistics Finland 2014)

Product group	Share (%) of all intermediate Consumption
<b>Mining and quarrying</b>	5,6
<b>Constructions and construction works</b>	4,4
<b>Chemicals and chemical products</b>	3,9
<b>Electricity, gas, steam and air-conditioning</b>	3,7
<b>Food products, beverages and tobacco products</b>	3,6
<b>Basic metals</b>	2,6

Significant for the Finnish economy pulp and paper industry is not on the list due to its orientation to export. Anyway, industry experiences decline since 2007. Comparing to 2007, production is expected to contract 34% till 2020. (Reini, Törmä & Mäkinen 2010, 22.)

#### **4.2.1 Most potential industries**

From all listed industries interviewed sellers of the air cannons in Finland have especially emphasized potential in the mining industry, despite the ups and downs the industry was going through lately. Another potential segment named by sellers was heat and power plants of the bio-energy industry. (Pneuplan Oy 21 Nov 2014; Vibratex Oy 27 Nov 2014; WAM Finland 27 Nov 2014.)

The mining industry has been booming in Finland since 2009. Industry has actively attracted investments. Great potential has been seen also because of the rapid development of high technologies, which reflects in the demand for the industry production. Turnover of the industry has been growing significantly till 2013. (Kokko 2014, 8.) In 2013 ore mining has reduced 39 % compared to 2012. The industry started to recess: investments flow slowed down, taxation became rigid, and Talvivaara mine has filed for bankruptcy (Kokko 2014, 59-60). The decrease in the industry has been associated with the general

economic decline. The positive thing is that problems in the industry are recognized, and despite the downturn businesses still expect the industry to develop. (Kokko 2014, 56-57.)

Concerning bio-energy industry, the only sector of it, where a need for the air cannons arises, is combined heat and power plants, and district heating plants designed to combust such bio-fuels as wood chips, wood residues, bark and sawdust. These power plants convert biomass resources into energy carriers including heat, electricity and transport fuels. Biomass material is exposed to material flow problems, and air cannons are the solution to solve them. (Company 20 Dec 2013.) Being the alternative to fossil fuel renewable energy becomes a worldwide priority in solving environmental issues as air emission and greenhouse effect. The EU strategic plan concerning climate and energy policies includes increase of the renewable energy consumption of 20 % till 2020. The share of Finland would be then 38 % from EU countries renewable energy production. On this basis, the national market also has potential for growth. (Alm 2011, 71-73.)

The fall caused by global economic recession has been noticed also in the construction sector. Industry forecast for year 2014 was 1,5 % decrease compared to the previous year. (Nieminen 2014.)

According to the Chemical Industry Federation of Finland, the economic situation of industry is also not very promising, and economic expectations are slightly below the zero level. However, despite the recession, the Finnish chemical production is expected to grow slightly in the beginning of 2015. (Chemical Industry Federation of Finland 2015.)

#### **4.2.2 Less potential industries**

Despite the fact that the baking sector is the leading and most profitable one on the Russian market for air cannons, in Finland the situation is the opposite. According to the food industry report from 2014, domestic market is not expected to grow in the near term, and, in fact, is predicted to remain narrow. Food industry has to increase exports in order to grow. Import bans set by Russia aggravate the situation. However, there is a hope that situation with Russia will change. (Hyrylä 2014, 73-74.)

The baking sector situation is in connection to the status of the whole food industry in general, i.e. the size of the domestic market does not give space for industry development. However, the baking sector is supported by the Finnish government and according to the long-term strategy of the Food Industry Union for 2010-2020, the plan is to be oriented towards exporting. The strategy is aimed to develop Finnish bakery products' and

supplies' brands on the foreign markets, and increase of Finnish brands competitiveness globally. (Hyrylä 2011, 46-50.)

### 4.3 Air cannons sector structure

Air cannon sector will be examined utilizing industry structure analysis. Up-coming sub-chapters discuss every participant group of the sector, dynamics of the industry and its future prospects.

#### 4.3.1 Direct competitors

Among direct competitors of the Company there are several globally known international brands of the air cannon systems and one Finnish brand. Company (20 Dec 2013) indicated that globally it has been competing with the manufacturers listed in table 8.

Table 8. Air cannons manufacturers considered as competitors by the Company (Company 20 Dec 2013)

Manufacturer of air cannons	Country	Distribution to Finland	Global market share estimated by the manufacturers
Martin Engineering	USA, head quarter Germany, European division	Martin Engineering, Germany; Vibratec Oy, Finland, official distributor in Finland; Imcon AB, Sweden, official distributor to Finland	50 %
Standard Industrie	France	Standard Industrie, France; Algol Oy, Finland, official distributor in Finland.	50 %
Pneuplan Oy	Finland	Pneuplan Oy, manufacturer	No estimation
Olivibra Spa	Italy	WAM Finland, official distributor in Finland	10-15%
VSR GmbH	Germany		no information
VIBCO	USA		no information
Pulsonics	USA		no information

Based on the answers of the interviewed competitors and customers, we can assume that the most known and utilized brands on the Finnish market are: Martin Engineering, Standard Industrie, Pneuplan Oy and Olivibra Spa.<sup>4</sup> (Finnsementti Oy 17 Dec 2014; LKAB22 May 2014; Pneuplan Oy 21 Nov 2014; Vibratec Oy 27 Nov 2014; WAM Finland 27 Nov 2014.)

<sup>4</sup>Only 6 interviewees interviewed on this matter. Further research is needed to be able to make definite conclusion and confirm the list of the most utilized air cannons brands.

Martin Engineering is a global market leader with its head quarters in the US and a German subsidiary covering the European market. Sales and distribution to Finland is organized from the German division and via official distributors in Finland (Vibratec Oy) and in Sweden (Imcon AB). (Martin Engineering 2014.) Standard Industrie located in France is the second largest manufacturer of air cannons. The company has multiple subsidiaries worldwide (Standard Industrie 2014). Standard Industrie distributes their products to Finland via head office in France and a Finnish agent Algol Oy (Standard Industrie 15 Feb 2015). Italian manufacturer Olivibra Spa is represented in Finland via WAM Finland (WAM Finland 27 Nov 2014). Pneuplan Oy is the only Finnish manufacturer of air cannons (Pneuplan Oy 21 Nov 2014). Thus, the majority of the air cannons' sellers on the Finnish market with one exception are importers.

Three Finnish sellers of the air cannons were interviewed for the research: 1) Finnish manufacturer Pneuplan Oy; 2) Vibratec Oy - importer of Martin Engineering's air cannons; 3) WAM Finland importer of Olivibra Spa equipment.

There is a common thing between interviewed companies. For all of them distribution of air cannons is just a side business, and their major business field is different. Only up to 5 % of the companies' turnovers come from sales of the air cannons. All interviewees had difficulties to estimate own shares of air cannons sales on Finnish market. (Pneuplan Oy 21 Nov 2014; Vibratec Oy 27 Nov 2014.) Only importer of Olivibra Spa gave more or less exact estimation of 3-5 % (WAM Finland 27 Nov 2014).

Concerning rivalry in the industry, two of the interviewed competitors consider competition in the industry to be high. Finnish manufacturer Pneuplan named Martin Engineering as the worst competitor. Distributor of Martin Engineering's air cannons indicated Standard Industrie and Pneuplan as worst Martin Engineering's competitors in Finland. (Pneuplan Oy 21 Nov 2014; Vibratec Oy 27 Nov 2014). Importer of Olivibra Spa brand, on the other hand, said:

"Actually we do not have any competition in our niche, since we sell the smallest size of the air cannons" (WAM Finland 27 Nov 2014)

He does not see competition as a problem, because there are not so many manufacturers in the industry overall. Olivibra Spa is also not considered as a competitor by Vibratec Oy and Pneuplan Oy (Pneuplan Oy 21 Nov 2014; Vibratec Oy 27 Nov 2014). Company itself sees that there are only few manufacturers of air cannons produce the largest sizes of the product (Company 20 Dec 2013). Therefore, we can assume that level of the competition on the Finnish market varies depending on the technical dimensions and size of manufac-

tured air cannons, and there is a possibility for a niche and a room for a new market player.

According to the interviewees, air cannon sector seems to be quite conservative in sense that information on the need of material flow problem solution always comes from a customer. Customer is always the first to contact the supplier of air cannons. (Pneuplan Oy 21 Nov 2014; Vibrattec Oy 27 Nov 2014; WAM Finland 27 Nov 2014.) Common marketing approach used in the industry appears to be “word of mouth” (Vibrattec Oy 27 Nov 2014). There is no practice of proactive sales methods, active marketing and promotion of air cannons by suppliers, revealed through the research.

Interviewed companies see the effectiveness of the solution and technical qualities to be their competitive advantage. The importer of the market leading brand does not consider any other aspects such as delivery time and price as a matter for competition (Vibrattec Oy 27 Nov 2014). Other sellers see their competitive advantage in prompt delivery times (Pneuplan Oy 21 Nov 2014; WAM Finland 27 Nov 2014) and longer than usual warranty time (Pneuplan Oy 21 Nov 2014).

#### **4.3.2 Substitutes as competitors**

Sellers of the air cannons system consider manufacturers of substitute equipment as competitors to some extent.. Solutions named as substitutes of air cannon systems are: fluidization and vibration equipment, fluidization pads, industrial vibrators and vibration feed platforms, pneumatic hammers. (Pneuplan Oy 21 Nov 2014; Vibrattec Oy 27 Nov 2014; WAM Finland 27 Nov 2014.) Air cannons and substitutes suppliers agree that their products cannot completely replace one another and push the competitive solution from the market at least in the near term. (Pneuplan Oy 21 Nov 2014; Vibrattec Oy 27 Nov 2014; WAM Finland 27 Nov 2014, Skako Vibration A/S 22 May 2014). Definitely, there are areas, where competition between air cannons and substitutes is extremely high. With no objective (e.g. ecological, financial) reasons, the decision to buy either an air cannon or substitute is usually made by the customer according to the previous positive experience (WAM Finland 27 Nov 2014). On the other hand, there are also clear cases when choice between air cannon systems and substitute equipment is determined by working conditions e.g. storage vessel size and type, material type and moisture, air humidity and other working conditions (Vibrattec Oy 27 Nov 2014, Skako Vibration A/S 22 May 2014). Interviewed manufacturer of vibration equipment Skako Vibration A/S (22 May 2014), for instance, indicated:



"Vibration equipment cannot compete with air cannons, when: a) it is a possibility of damaging the storage vessel walls using vibration equipment, or vibration is prohibited due to the working circumstances; b) humidity of the working conditions or moisture of the material is very high, for example, when working under the ground inside the mine; c) size and volume of the storage vessel is too large" (Skako Vibration A/S 22 May 2014).

Air cannon sellers agree that in certain circumstances there can be only one technically effective solution – either it is air cannon system or fluidization / vibration substitute (Pneuplan Oy 21 Nov 2014; Vibrattec Oy 27 Nov 2014). They do not believe that air cannons can push substitutes from the market referring to the high price of the air cannons comparing to some substitutes (Vibrattec Oy 27 Nov 2014).

Potential users of the air cannons are interested in the most productive and cost effective, energy saving material flow problems' solution. For them it does not matter if it is an air cannon system or its substitute. Depending on the circumstances they either use air cannons or easily replace them with substitute, if air cannons do not solve the problem. (Finnsementti Oy 17 Dec 2014.)

#### **4.3.3 Buyers of air cannons**

Potential buyers of industrial B-to-B products operate at different points of the value chain. End-users of the air cannon systems are plants, factories and production facilities of different industries. Delivery of the air cannon system to the end-user on Finnish market happens through direct sale or through intermediaries. Intermediaries, who eventually supply air cannons to the end-users, are: 1) constructors of the plants, factories and production facilities; 2) silos manufacturers or other system equipment manufacturers; 3) silos maintenance service providers, when end-users out-source the maintenance of the storage vessels (Pneuplan Oy 21 Nov 2014; Vibrattec Oy 27 Nov 2014; WAM Finland 27 Nov 2014).

End-users representing three different industries – mining, bio-energy and construction – were interviewed for the research. From three interviewees only LKAB mining has subcontracted the maintenance of silos and delegated search for the material flow problem solution to service provider (LKAB 22 May 2014). Heat plant and cement production plant search for the material flow problems solutions and purchase the equipment by themselves using plants' engineers and engineering companies as consultants if needed (Finnsementti Oy 17 Dec 2014; Savon Voima Oy 15 Dec 2014).

#### 4.3.4 Purchase decision making

The purchase decision making process varies depending on who the customer is. From the side of constructors and silos manufacturers purchasing of the air cannons is usually initiated by engineers designing the whole construction project. Engineers, together with the purchasing managers, observe and compare material flow problem solutions offerings on the market and select the most suitable. The selected option has to meet technical requirements as well as fit into the project budget. Final decision to add a supplier to the project makers' list is made by top-level management of the construction company. (Finnsementti Oy 17 Dec 2014; Vibrattec Oy 27 Nov 2014.)

On end-users' side, at plants and production facilities, the process of purchasing, as presented in figure 11, starts from the need recognized and confirmed by the personnel responsible for organization of the production process and its part related to discharge of silos from the bulk material, usually they are production or operations managers. Next step is to clarify and investigate technical details of the need on the plant's engineering level. Then plant engineers and purchasing manager compare technical solutions and offers made by suppliers of air cannons. Finally, the selected solution is presented to the top management of the plant, who makes the decision to purchase. (Finnsementti Oy 17 Dec 2014; Vibrattec Oy 27 Nov 2014; Savon Voima Oy 15 Dec 2014.)

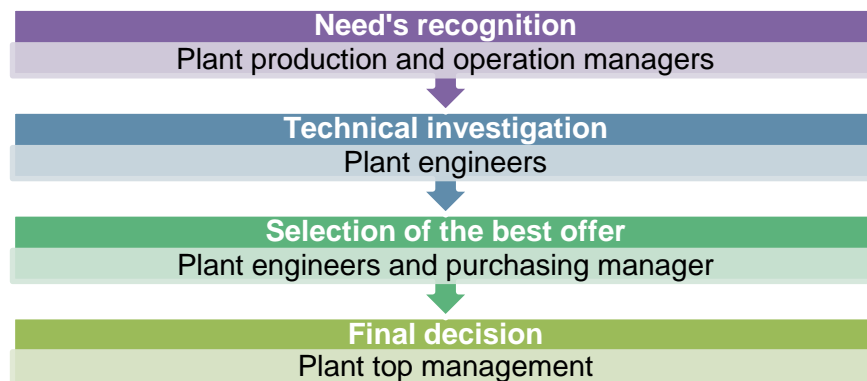


Figure 11. Stages of the purchasing process and responsible personnel of air cannons end-users

The timeframe for making of purchasing decisions for the greenfields can be longer than one year. This means that suppliers of air cannons get first reactions to their offers in very late stage and receive the order sometimes after several years from when the quotation request was first made by the constructor. End-users and silos maintenance providers usually have urgent material flow problem to be resolved very quickly. In such cases delivery of air cannons happens already in several weeks. (Vibrattec Oy 27 Nov 2014.)

#### **4.3.5 Suppliers of the components**

The most critical component of the air cannon system, which Company does not manufacture itself, is categorized as a pressure vessel. It subjected to the requirements of the Simple Pressure Vessel Directive 2009/105/EC. Suppliers of the component are selected first of all based on their capabilities to fulfill technical, quality and legislation requirements of EC. Company has out-sourced manufacturing of the customized pressure vessels to a sub-contractor on the Russian market. Unfortunately, the Russian subcontractor has no competences to produce pressure vessels in accordance to EC directives. (Company 20 Dec 2013.)

Two Finnish manufactures of pressure vessels (VKT Oy and GavGroup Oy) were interviewed for the research. Terms, conditions and estimated price of pressure vessel manufactured according to the Company's technical drawings, which they gave were quite similar. Delivery and payment terms are acceptable and commonly used in Finland. Price level is much higher than the price of the supplier for Russian market. (VKT Oy 17 Dec 2014; GavGroup Oy 4 Dec 2014.) It will definitely affect the whole pricing strategy of the Company. Suppliers indicated that price is volume based. It can be discounted in the future if the quantity of orders grows. Another possibility for price decrease would be, if sub-contractors would consider a Company as with a customer with high potential and level of credibility. Usually such customers are well-known and reputed on the market. (VKT Oy 17 Dec 2014; GavGroup Oy 4 Dec 2014; Company 20 Dec 2013.)

#### **4.3.6 Threat of new entrant**

Company considers itself as a new entrant to the Finnish market of the air cannons. Analysis of its position as a newcomer helps to get insight on competition in the industry and develop functional market entry strategy.

Company realizes that product's technical effectiveness, its capability to solve a problem and reliability are what is most appreciated in the industry. That is why Company is oriented on the technical enhancements of the product and further Company's know-how development.

Awareness of the conservativeness of the industry facilitates the new entrant to gain knowledge on the industry structure to be able to assimilate in it in a way beneficial for the Company. On the other hand, insight of the industry structure will help to overcome competition settled on the market by inventing and utilizing extraordinary approaches based on networking and collaboration, which are overlooked by constant market players. Com-

pany aims to attract potential customers with added value based on the flexibility and customized solution of the end-users' problem. As a Company with non-EU roots, it also understands the differences of business practices occurring from the cultural background and aims to collaborate with domestic market players for prompt outcome of market entry. (Company 20 Dec 2013.)

#### **4.3.7 Prospects of the air cannon sector**

Different views on the future of air cannons sector and development of the technical solution itself were presented during the research.

Buyers stated that air cannons do not completely solve material flow problems. All of the interviewed end-users use also other, e.g. chemical, solutions in addition to air cannons for better outcomes (Finnsementti Oy 17 Dec 2014; LKAB 22 May 2014; Savon Voima Oy 15 Dec 2014). There is also an opinion that air cannons have been used so far because there was not any other alternative solution invented. However, end-users think that there will not be alternative solution found in the near future. This means that air cannons will not be replaced and will still be actively used in production processes (Finnsementti Oy 17 Dec 2014; LKAB 22 May 2014; Savon Voima Oy 15 Dec 2014).

Sellers do not have any particular marketing or other strategy for air cannons on the Finnish market because sale of air cannons is a side business for all of them (Pneuplan Oy 21 Nov 2014; Vibratec Oy 27 Nov 2014; WAM Finland 27 Nov 2014). Concerning the demand for the air cannons in Finland in the nearest years, the importer of the market leader's brand (Martin Engineering) thinks that it continues to remain at the same level as it is now. But it depends of the development direction of mining and bio-energy industries. (Vibratec Oy 27 Nov 2014). The importer of the less popular Olivibra Spa brand, on the other hand, predicted contraction of the air cannon market. The goal of WAM Finland for the near future is to offer to the market new more effective, eco-friendly and low cost material flow problems solution. (WAM Finland 27 Nov 2014.)

#### **4.4 Suitability of the air cannons to market requirements**

Suitability of the air cannons to the target market is determined by different aspects of the external environment including macro-environmental and industry requirements. In addition to customer satisfaction with the technical qualities, product is also required to fulfill safety and legal obligations of the customer as well as enhance an outcome of customer's business operations.

#### **4.4.1 Quality and standards requirements**

The absolute requirement for the pressure equipment placed to the European market even if equipment is manufactured outside EU is CE mark as per Pressure Equipment Directive 97/ 23/EC. CE-mark allows free movement and sale of the equipment throughout the EC. Manufacturer of the pressure equipment is obligated to produce the pressure equipment of the categories I-IV in accordance to instructions (see table 3 in Sub-chapter 4.1.4). It gives right to provide a manufactured pressure equipment with CE mark. Equipment manufactured only in accordance with “sound engineering practice” can be placed to the market without CE mark. (Pressure Equipment Directive 97/ 23/EC.)

At present time Company’s products does not fulfill the requirement of quality and standards mentioned above (Company 20 Dec 2013). Research has shown that manufacturing of the equipment in accordance to the EC standards is possible also outside EU. There are, for instance, authorities and specialists in Russia and China, who are capable to provide all related inspections and paper work in case manufacturer desires to update production processes according to the standards (BDG 2014).

#### **4.4.2 Process standards**

Other manufacturing standards requirements concern the quality management system and production process standards that it recommends. There are no direct recommendations of the production standards in the Pressure Equipment Directive 97/ 23/EC. However, according to the notifying authorities, in Finland, manufactures of the pressure equipment are advised to use Standards SFS-EN-13445 (part concerning vessels 1-17), SFS-EN-1480 (part concerning pipes), which helps to avoid any non-conformity with pressure equipment legislation. (Dekra Industrial OY 15 Dec 2014; Inspecta Tarkastus Oy 15 Dec 2014.)

#### **4.4.3 Working conditions requirements**

There are certain requirements to the product depending on specific working conditions of the customer. Air cannon system solution has to be designed taking into account technical data of the storage vessel, where it will be installed, and production line as a whole. Dimensions to be examined are: shape and material of the storage vessel, working temperature (high, low), characteristics of the storage material (e.g. toxic, explosive, abrasive, sticky and so on). End-users of product require corresponding tests of air cannons in demanding conditions before they can accept the product. Such tests are not covered by the

requirements of EC directives concerning pressure equipment. (Finnsementti Oy 17 Dec 2014.)

#### **4.4.4 Product and supplier qualities**

The most valuable technical quality of air cannons from end-users' point of view is related to the indexes of the released air pressure of the product.<sup>5</sup> Other qualities are low maintenance and minimum of failures and interruptions. Overall, for end-users the most crucial factors of the product and supplier selection are the usual: quality and price. Preferable delivery time of the product is 1 month from the order, and desirable warranty time 1 year. (Finnsementti Oy 17 Dec 2014; LKAB 22 May 2014; Savon Voima Oy 15 Dec 2014.)

Research has shown that interviewed end-users do not have any prejudices towards country of origin of the air cannon they use, as far as it is a functional and effective solution for their problem. However, the credibility of the brand and quality reputation plays a certain role in the selection of air cannons. Concerning the suppliers, all buyers agree that for smooth business operations it is preferable to deal with a domestic supplier from Finland or the EU.(Finnsementti Oy 17 Dec 2014; LKAB 22 May 2014.)

#### **4.4.5 Differentiation of air cannons**

A few issues that arose during the research can be a starting point for developing Company's competitive advantage based on the differentiation.

Effectiveness of the product is considered to depend first of all on the technical qualities and know-how of the product (Finnsementti Oy 17 Dec 2014; LKAB 22 May 2014; Savon Voima Oy 15 Dec 2014; Pneuplan Oy 21 Nov 2014; Vibrattec Oy 27 Nov 2014; WAM Finland 27 Nov 2014). A better technical solution still is the main advantage against the competitors' product. Constant development of the product towards more effective, user friendly and ecologic will facilitate out performance of the competitors.

All interviewed sellers stated that the product they sell is so called "shelf product" meaning that air cannons are manufactured as a serial product with no customization in accordance with the particular needs of each customer (Pneuplan Oy 21 Nov 2014; Vibrattec Oy 27 Nov 2014; WAM Finland 27 Nov 2014). End-users, on the other hand, claimed that air cannon systems should fit the working environment, which can differ from industry to in-

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<sup>5</sup> Since it is pure technical matter it will not be discussed in the research any further.

dustry (Finnsementti Oy 17 Dec 2014; LKAB 22 May 2014; Savon Voima Oy 15 Dec 2014). Possibility for the differentiation appears to be in the customization of the product, bringing more value to end-users.

Regarding the need for the supplementary products such as installation, service or training, it appears that it depends a lot on the air cannon suppliers' offering on the market. Interviewed importers of air cannons do not provide any of those services (Vibratec Oy 27 Nov 2014; WAM Finland 27 Nov 2014). Only one of them gives installation instructions by phone if needed (WAM Finland 27 Nov 2014). The Finnish manufacturer, on the other hand, provides a full range of service, but it also has 2 years warranty for the product, obviously, in order to compete with larger foreign manufacturers (Pneuplan Oy 21 Nov 2014). Most of the interviewed end-users arrange installation and service of air cannon by themselves (Finnsementti Oy 17 Dec 2014; Savon Voima Oy 15 Dec 2014) or through sub-contractors (LKAB 22 May 2014).

Environmental qualities or requirements of the air cannon systems were not arisen by any of interviewees during the research. Competitors of the Company do not mention air cannon system to be ecological solution while promoting the product. Only one of the interviewed importers claimed that air cannons have to be replaced with new ecologic solution (WAM Finland 27 Nov 2014). Environmental issues i.e. qualities of the product are not of high priority in the industry at least at the moment. However, it becomes a way of the differentiation.

## **5 Discussion**

The last Chapter summarizes the key outcomes of the research and answers the investigative questions. Key findings will be presented using investigative questions as a starting point for the discussion. Presented findings will be translated into suggestions that could be used to support decision making process related to the internationalization. Assumed errors of the research will be indicated for objective assessment of findings. We then will evaluate the reliability and usability of the thesis results. The thesis ends with proposals for further research and personal learning outcomes out of the study.

### **5.1 Key findings**

Key findings of the research are divided in accordance with investigative questions and concern: 1) consideration on the market entry mode; 2) air cannon market and industry structure, 3) considerations on the suitability of the Company's air cannons in its present mode to the requirements of the Finnish market.

The examination of the political and economic situations of Russia and Finland has shown that today's market situations in both home and host countries are unstable and risky. Obviously, there are much more uncertainty in Russia. On the other hand, there might be opportunities hidden for the Company from the Russian economic crisis. Uncertainty of Russian market development could play a role in stimulating urgent actions towards internationalization and expansion to more stable markets. Affected by global economic and political instability, the Finnish economy at least has some positive forecasts for economic revitalization and growth in some industries. Despite the recession there are several industries in Finland with relatively high potential for air cannon business. Mining, bio-energy and construction and chemical sectors show signs of some development which makes it reasonable to target those segments.

To open a discussion concerning the choice of market entry mode between export and FDI we bring the issue of suitability of the Company's product to the requirements of Finnish market first.

The essential outcome of the research is that Company was provided with the all-embracing information regarding technological and legal requirements to the pressure equipment. It is important that Company was informed about the sources of the information including official statutes of the industry, unofficial guides and official authorities supervising the industry. Regulations and requirements were not only discovered during the



research but also applied to the case product that gave more understanding and knowledge of the EU standards of design, manufacturing and inspection of the equipment applicable exactly to the situation of the Company knowledge of the production processes standards. Findings from technological and legal areas have shown that at present time air cannons manufactured by the Company do not meet technological and legal requirements and are, therefore, not currently suitable for Finnish and EU market.

The question is, therefore, whether it is even possible to arrange production of the pressure equipment in accordance with EU standards. At first sight, there is an impression that manufacturing of the pressure equipment for placing to EC market is possible only inside EU. However, there are evidences found during the research that, in principle, manufacturing of the pressure equipment according to the EU standards is possible outside EU, and also in Russia. The matter just needs further research and comparing of advantages and disadvantages (clearness of the procedures and paper work, costs) of organizing the manufacturing according to the regulations in Finland and Russia.

Concerning export challenges, which were expected to be proved during the research, there was found no additional difficulties related to export of pressure equipment from Russia. Export procedures for air cannons have remained the same and so far have not been affected by sanctions and trade restrictions. Export from Russia has always been challenging, but companies operating in Russia have got used to more time consuming and costly export handling procedures than in the EU. Therefore, theoretically it is still possible to internationalize through exporting, but it definitely requires further research of costs of the process in Russia, possibility to find right competencies and resources from Russia and other practicalities hampered in Russia for no reasons. We still consider export as a risky market entry mode.

Another argument against exporting is related to the social-cultural aspect. Despite the findings on the positive attitudes towards functional air cannon solutions, there are doubts that suppliers of air cannons based in Russia would have the same reputation. There are stereotypes concerning quality in relation to the geographical market. Russian quality in technologies was never appreciated, unless technologies are related to space and military fields. Also, there are prerequisites that potential buyers will choose smoother business processes and suppliers from EU. Russian suppliers will always loose the competition to the EU suppliers. To avoid failures based on the social-cultural aspect manufacturer with Russian roots it is better to establish the presence in Finnish market at least to some extent.

Concerning establishment of FDI, the risk is that global air cannon market is so tight and divided between several large manufacturers. The Finnish market is even smaller. For interviewed sellers air cannon business is not the main field of business operations and constitutes only 5 % of the turnover. Establishing of FDI does not seem a rational option. Intermediary mode based on the partnership and collaboration seems to be a better solution at first sight.

Structural analysis of the air cannon sector was conducted by interviewing relevant market players operating or related to air cannon sector. Primary data in forms of practices, experiences and opinions of the companies working in the field of air cannons gives the Company understanding and awareness of the market structure in terms of: competitors in Finland, types of customers and purchasing decision, terms and conditions of working with suppliers, and what to expect from the new entrants to the market.

There were few significant findings made during the research:

1. Air cannon sector in Finland is quite conservative in terms of the ways sellers market and promote air cannons to customers. Initiative of informing about the need is always on the customers' side, i.e. end-users contact suppliers when need arises. There are no signs of pro-active sales methods noticed.
2. Collaboration and partnering is noticed to some extent, but it might be more efficient and serve the purpose of attracting customers.
3. Bargaining power of the components suppliers on Finnish market is relatively high. Suppliers' price level is similar for the whole pressure equipment manufacturer sector.
4. There are possibilities for a niche in the Finnish market of air cannons. The edge sizes (smallest and largest) of the range of air cannons offered on the market are very rare. According to opinions presented in the research, there is very little or no competition in those areas.
5. Air cannons are sold as universal "shelf-product" from the sellers' point of view, but has to work in different working conditions from the buyers' perspective. This can be a sign of customization of the product and more closer cooperation with buyer starting from design stage.
6. Concerning supplementary products such as service, installation, maintenance and training, very little offering on the market was noticed during the research. Here can be a place for diversification and base for developing competitive advantage.

Prospects for the industry lie in the general economy growth and development of the mining and bio-energy industries. From the product perspective, it is obvious that as a technical solution air cannons do not solve all material flow problems. The future of the prod-

uct is seen in its R&D towards more effective, economic, environmental and energy saving solution.

## **5.2 Suggestions on the further actions and marketing research**

Company is advised to consider market entry mode base on collaboration and partnering with domestic companies. The exact entry mode and partner selection is a subject for further research.

Suggestion for the sales strategy development is to make use of the pro-active sales methods, collaboration and partnering with designers and constructors of end-users' production facilities. Proposed target industries are mining, bio-energy and chemical segments. Another suggestion is to focus on the niches with less competition (niches by lowest and highest sizes). These matters need further research.

In order to reduce a purchasing price of the components for air cannons, there is an option to find a sub-contractor from another EU country, where production costs are lower than in Finland. There is also a possibility to consider finding a sub-contractor from emerging markets (China, for instance), but risks related to quality should be carefully evaluated.

Since air cannons are constantly competing with other technical solutions and technical development is happening rapidly, it is suggested to research the prospective directions of the product development such energy saving and ecology. Other directions in developing competitive advantage of the product are customization and accompaniment with services.

## **5.3 Errors, reliability and usefulness of the research**

The research aimed to be conducted based on reliable data. Information from secondary resources was clarified by interviewing relevant people in cases of uncertainty.

Collecting primary data was less successful. Some interviewees were very cooperative, others gave very little information. Broader primary data would be desirable for better results and -confirmation of the received information.

Collected information is considered as extremely useful for the Company and will definitely improve Company's opportunities on Finnish market, facilitate competitiveness of the product and help to make strategic decision regarding pricing etc. I am confident that in-

formation and knowledge received as outcome of the research could be used for strategic decision making or as a solid base for further research.

#### **5.4 Learning outcomes**

This thesis was my first individual marketing research conducted for the real needs of business development through expanding into international markets. The project made me realize the value of knowledge in terms of revenues and other outcome of business operations. One of the most important learning outcomes was assessment of the collected information in regards to relevance and usefulness for the commissioning company. Another subject for learning was selection of a right research approach in order to achieve goals and objectives of the research in a way beneficial for the commissioning company. I definitely have used my knowledge of market research tools. I have definitely deepened my knowledge of the global economic forces and principles of the industry structure. I also enjoyed the analysis of interconnections between the external environment and one particular business case, realizing that findings and conclusions I made are relevant for real business strategy development.

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## Appendices

### Appendix 1. Supporting interviews

Table 2. Authorities and organizations interviewed to support the research

<b>No</b>	<b>Organization</b>	<b>Interviewee</b>	<b>Date</b>	<b>Method</b>
1	Dekra Industrial Oy	Pressure equipment specialist	15 Dec 2014	Telephone
2	Finnish Customs	Customs information service for business customers	15 Jan 2015	Telephone
3	Inspecta tarkastus Oy	Pressure equipment specialist	15 Dec 2014	Telephone
4	Logistika Service	Customer broker	15 Jan 2015	Telephone
5	Standard Industrie	Sales manager	16 Feb 2015	Telephone

## Appendix 2. Main research interviews

Table 4. Interviewed representatives of industry structure groups

### Competitors: manufacturer

No	Organization	Interviewee	Date	Method
1	PneuplanOy	Sales manager	21 Nov 2014	E-mail

### Competitors: importers

No	Organization	Interviewee	Date	Method
1	VibratecOy	General manager	27 Nov 2014	E-mail
2	WAM Finland	Sales manager	27 Nov 2014	E-mail

### Customers: end-users

No	Organization	Interviewee	Date	Method
1	FinnsementtiOy	Production manager	17 Dec 2014	E-mail
2	LKAB	Production manager	22 May 2014	Face to face
3	Savon VoimaOy	Production manager	15 Dec 2014	Telephone

### Substitutes' manufacturer

No	Organization	Interviewee	Date	Method
1	Skako Vibration A/S	Sales manager	22 May 2014	Face to face

### Suppliers

No	Organization	Interviewee	Date	Method
1	GavGroupOy	Sales director	4 Dec 2014	E-mail
2	VKTOy	Sales manager	17 Dec 2014	E-mail

### New entrant

No	Organization	Interviewee	Date	Method
1	Company	Company representative	20 Dec 2013	Face to face

### **Appendix 3. Interview guide for manufacturers**

#### **Yritys ja sen asemamarkkinoilla**

Is PneuplanOy the only one Finnish manufacturer of air cannons?  
What is a share of air cannons sales from company's turnover?  
What is your company's share in air cannon market in Finland?  
How PneuplanOy is placed among air cannons suppliers in Finland?  
Does Pneuplan sell air cannons abroad? Where?  
What is the global market share of PneuplanOy?

#### **Competition**

Is there strong competition among manufacturers / suppliers of air cannons in Finland?  
Or every market player has its own niche?  
What air cannon manufacturers your company considers as competitors on Finnish market?  
Are there other technical solutions of bulk material flow problems and discharge of storage vessels, which can be used instead of air cannons (substitute solutions)? What are they?  
Are there situations when both solutions air cannons and substitutes can solve material flow problem. How air cannon can compete with substitute then?

#### **Market structure**

How big air cannon market is in Finland? What are industries or industry sectors it includes?  
Who are the customers? End users? Plants constructors? Others?  
How do you recognize the customer's need of air cannon? Do the customers get in contact with supplier of air cannons? Or do you promote air cannon solutions actively offering the product and educating the customers?  
Who are contact persons (departments, positions, responsibilities) of the potential customers to whom you offer air cannons and who makes buying decisions?  
Are you aware of buying decision making process at customer's side? How long is it?  
What does delivery process of air cannon (from offer to shipment) include?  
What are stages of the delivery process?  
How long delivery of the air cannon takes from order to shipment?

#### **Product**

What are the most valuable features / attributes of your product from the customers' perspective?  
What is competitive advantage of your product comparing to competitors air cannons?  
Do you compete only with product or also with:  
- services (installation, maintenance)  
- price  
- delivery times and conditions  
How long warranty your air cannons have?

#### **Company and industry prospects**

How do you see development of air cannon market in Finland?  
Do you predict the growth of the air cannon market share of your company in Finland?

## **Appendix 3a. Interview guide for manufacturers (in Finnish)**

### **Yritys ja sen asema markkinoilla**

Onko Pneuplan Oy ainut siilotykkivalmistaja Suomessa?  
Kuinka suuri Pneuplan Oy:n liikevaihdon osuus tulee siilotykkimyyntistä?  
Mikä on Pneuplan Oy:n markkinaosuus Suomen markkinoilla?  
Millä sijalla Pneuplan Oy on Suomessa siilotykkien toimittajista?  
Toimittaako Pneuplan siilotykkeitä ulkomaille? Mihin maihin?  
Mikä on Pneuplan Oy:n markkinaosuus maailman markkinoilla?  
Millä sijalla Pneuplan Oy on maailmalla siilotykkien toimittajista?

### **Kilpailu**

Onko Suomessa kova kilpailu siilotykkivalmistajien / -toimittajien kesken? Vai jokaiselle markkinapelajalle on varattu oma alue?  
Keitä siilotykkivalmistajia pidätte kilpailijoinanne?  
Mitkä ovat korvaavat tuotteet ja ratkaisut, joiden kanssa Pneugun kilpailee?  
Onko tilanteita kun sekä siilotykki että korvaava tuote saa käyttöä. Miten siilotykki voi kilpailla korvaavien tuotteiden kanssa silloin?

### **Alan markkinoiden rakenne**

Kuinka isot markkinat siilotykeille on Suomessa? Mitkä ovat teollisuudet / teollisuusalat, joilla on tarve siilotykeille?  
Keitä ovat asiakkaat? Loppukäyttäjät? Tehtaiden rakennuttajia? Muita?  
Kuinka saatte tietää asiakkaiden tarpeesta siilotykeille (Ilmoittavatko itse? Oletteko aktiivisesti markkinnoimassa tuotetta / yhteydessä potentiaalsiin asiakkaisiin?  
Ketkä ovat (miltä osastoilta, asemissa, tehtävissä) asiakkaiden yhteyshenkilöt, keille tarjoatte siilotykkeitä ja ketkä tekevät ostospäätöksiä? Miten pitkä ja päätöksenteko on ostajan puolella?  
Mikä on siilotykin toimitusprosessi tilauksesta toimitukseen? Kuinka kauan se kestää?

### **Tuote**

Mitkä ovat siilotykin ominaisuudet, joita ostajat arvostavat eniten?  
Mikä on Pneugunin kilpailuvaltti (competitive advantage)  
Kilpailletteko vain tuotteella vai myös asennus / huolto ym. palveluilla / hinnalla / toimitusajoilla?  
Kuinka pitkä takuu siilotykillä on?

### **Yrityksen ja alan tulevaisuus**

Miten näette siilotykkien valmistelun kehittyvän Suomessa?  
Uskotteko Pneuplan Oy:n kasvuun ko. sektorilla?

## **Appendix 4. Interview guide for importers**

### **Company and its position on the market**

Is your company official distributor of air cannons in Finland?

Air cannons of what manufacturers your company sells / represents in Finland?

What is your company's share in air cannon market in Finland?

Do you supply air cannons also in other foreign countries besides Finland? Which countries?

What is the global market share of the air cannon manufacturer that you represent?

### **Competition**

Is there strong competition among manufacturers / suppliers of air cannons in Finland?

Or every market player has its own niche?

How air cannon market is shared?

Globally?

In Finland?

Who are in leading position?

Who are placed second etc.?

Whom from air cannon manufacturers your company considers as competitors on Finnish market?

(Please put in order : 1 – the strongest competitor, 2 – less strong competitor etc.)

Are there other technical solutions of bulk material flow problems and discharge of storage vessels, which can be used instead of air cannons (substitute solutions)? What are they?

How air cannon solution can compete with substitute solutions?

Are there environmental / technical / financial / organizational etc. aspects of the air cannons, which can over perform the competing substitute solutions?

### **Market structure**

How big air cannon market is in Finland? What are industries or industry sectors it includes?

In which industries in Finland air cannon solution is utilized the most?

Who are the customers? End users? Plants constructors? Others?

How do you recognize the customer's need of air cannon? Do the customers get in contact with supplier of air cannons? Or do you promote air cannon solutions actively offering the product and educating the customers?

Who are contact persons (departments, positions, responsibilities) of the potential customers to whom you offer air cannons and who makes buying decisions?

Are you aware of buying decision making process at customer's side?

What does delivery process of air cannon (from offer to shipment) include?

What are stages of the delivery process?

How long delivery of the air cannon takes from order to shipment?

### **Product**

What type of the product air cannon is:

- customized for every order?

- stock product immediately ready for delivery?

What are the most valuable features / attributes of your product from the customers' perspective?

What is competitive advantage of your product comparing to competitors air cannons?

What is competitive advantage of your product comparing to substitute solutions of bulk material flow problems?

Is air cannon solution ecological solution comparing to substitute solutions of bulk material flow problems?

Do you offer also installation, maintenance services in addition to the core product?

Are installation and maintenance always provided by air cannon supplier? Could end users install and maintain air cannons themselves?



Do you educate and train your customers in matters of installation, usage and service of air cannons?

Do you compete only with product or also with:

- services (installation, maintenance)
- price
- delivery times and conditions

How long warranty your air cannons have?

What are obligatory test / permissions / certificates which are required by the users / buyers of air cannons in Finland? Who provides them – supplier or end-user?

### **Future of the industry and company**

How do you see development of air cannon market in Finland? Will it increase or decline?

How substitute solutions of bulk material flow problems will affect the market of air cannon in Finland?

Do you predict the growth of the air cannon market share of the manufacturer you present in Finland?

What are future goals of your company on Finnish market?

## **Appendix 4a. Interview guide for air cannon importers in Finnish**

### **Yritys ja sen asema markkinoilla**

Onko Yrityksenne virallinen siilotykkien jälleenmyyjä Suomessa?  
Keiden valmistajien siilotykkeitä Yrityksenne myy / edustaa Suomessa?  
Kuinka suuri Yrityksenne liikevaihdon osuus tulee siilotykkimyyntistä?  
Mikä on Yrityksenne markkinaosuus Suomen siilotykkimarkkinoilla?  
Toimittaako Yrityksenne siilotykkeitä myös ulkomaille? Mihin maihin?  
Mikä on edustamanne siilotykkivalmistajan markkinaosuus maailman siilotykkimarkkinoilla?

### **Kilpailu**

Onko Suomessa kova kilpailu siilotykkivalmistajien / -toimittajien kesken? Vai onko jokaiselle markkinapelaajalle varattu oma alue?  
Miten siilotykkimaailmanmarkkinat on jaettu? Kuka valmistajista on johtavassa asemassa? Kuka on toisella sijalla jne.  
Keitä siilotykkivalmistajia pidätte kilpailijoinanne Suomessa?  
Laittaisitteko tärkeysjärjestykseen:  
1 – pahin kilpailija, 2 – vähemmän tärkeä kilpailija jne.  
Onko muita teknisiä ratkaisuja siilojen tyhjentämiseen, joita voidaan käyttää siilotykin sijaan? Mitkä ne ovat?  
Miten siilotykki voi kilpailla ko. ratkaisun kanssa?  
Onko olemassa ekologiset / tekniset / taloudelliset ym. tekijät / syyt kun siilotykki voittaa kilpailevat vaihtoedot?

### **Alan markkinoiden rakenne**

Kuinka isot markkinat siilotykeille on Suomessa? Mitkä ovat teollisuudet / teollisuusalat, joilla on tarve siilotykeille?  
Keitä ovat asiakkaat? Loppukäyttäjät? Tehtaiden rakennuttajat? Muut?  
Kuinka saatte tietää asiakkaiden tarpeesta siilotykeille (Ilmoittavatko itse? Oletteko aktiivisesti markkinnoimassa tuotetta / yhteydessä potentiaalsiin asiakkaisiin?)  
Ketkä ovat (miltä osastoilta, asemissa, tehtävissä) asiakkaiden yhteyshenkilöt, keille tarjoatte siilotykkeitä ja ketkä tekevät ostospäätöksiä? Miten päätöksentekoprosessi menee ostajan puolella?  
Mikä on Yrityksenne siilotykin toimitusprosessi tilauksesta toimitukseen ja asennukseen?  
Mitkä vaiheet siihen kuuluvat? Kuinka kauan siilotykin toimitus kestää?

### **Tuote**

Onko siilotykki asiakkaan tarpeisiin räätälöity tuote vai hyllytavara?  
Mitkä ovat siilotykin ominaisuudet, joita ostajat arvostavat eniten?  
Mikä on teidän maahantuomanne siilotykin kilpailuvaltti (competitive advantage) verrattuna muiden valmistajien siilotykkeihin? Entä kilpaileviin bulkkimateriaalitukosten virtaongelmien ratkasuihin?  
Onko siilotykki ekologinen ratkaisu verrattuna muihin ratkaisuihin?  
Tarjoatteko paitsi itse siilotykkeä myös siihen liittyviä palveluita, kuten asennus ja huolto?  
Kuuluuko asennus aina siilotykin toimittajille? Pystyvätkö loppukäyttäjät hoitamaan asennuksen ja huollon itse?  
Jarjestättekö siilotykin asennukseen, käyttöön ja huoltoon liittyvää opastusta / koulutusta käyttäjille?  
Kilpailletteko vain tuotteella, vai myös asennus / huolto ym. palveluilla / hinnalla / toimitusajoilla?  
Kuinka pitkä takuu siilotykillä on?  
Mitkä ovat mahdolliset siilotykillä pakolliset ja ostajan / loppukäyttäjän vaatimat testit / luvat / sertifikaatit Suomessa? Kuka ne hakee – valmistaja, maahantuojat, loppukäyttäjä?

### **Yrityksen ja alan tulevaisuus**

Miten näette siilotykkimarkkinoiden kehittyvän Suomessa?  
Tuleeko siilotykkiratkaisu ajamaan kilpailevat ratkaisut pois markkinnoilta?  
Tuleeko Yrityksenne siilotykkimarkkinaosuus kasvamaan?  
Mitkä ovat Yrityksenne lähitulevaisuuden päämäärät ko. markkinoilla?

## **Appendix 5. Interview guide for the buyers**

### **Company and its position on the market**

What industry your company operates in?

Does your production process include storage of materials in silos?

What kind of material is stored in silos of your production line?

Have you experienced flow material blockages and problems (clinging, bridging, arching, rat-holing) during discharge of silos?

Have you used pneumatic solutions as air cannons for smoother discharge of silos?

Have you used other solutions than air cannons for solving flow material problems?

### **Competition**

What manufacturer brands of air cannons you are have used?

What brands of air cannons you are familiar with / have used:

- Martin Engineering
- Standard Industrie
- Pneuplan
- Olivibra Spa
- VSR GmbH
- VIBCO
- Pulsonic

Which manufacturer brands you appreciate / would use?

Would you prefer to buy / use air cannons produced by Finnish manufacturer or imported foreign manufacturer air cannons?

What are your preferences/ attitudes towards country of origin of air cannons?

Would you buy / use air cannons produced by manufacturers from following countries:

- USA
- EU countries
- Asia countries
- Russia

What are other solutions of material flow problems which can be used instead of air cannons in your production processes?

Are there cases, when it is possible to solve material flow problem either with air cannon solution or substitute solution? On what base you make your choice then?

### **Industry market structure**

Where you buy air cannons from?

- Directly from manufacturer?
- importer?
- constructor?
- From elsewhere?

Do sellers of air cannons actively promote their products, or do you need to contact them, when the need arises?

What stages purchasing process of air cannons (from recognition of need to purchasing) consists from?

Who in your company are involved into the purchasing process (e.g. technical manager. Purchasing manager, production manager, other)

Whose opinions affect decision to purchase?

Who does the final decision to purchase?

What are criteria of air canons supplier selection (i.g. product quality, price, delivery time, supplementary services)?

## **Product**

What are technical qualities of air cannons that you value the most as a user?

What are your technical requirements to the purchased air cannons?

Do you require:

- Technical tests, what?
- Quality certificates, what?
- Other documents, what?

What you require in terms of work safety and / or quality system management? Certificates? Standards? Other?

What are your requirements to air cannon suppliers concerning:

- Delivery time
- Service
- Installation
- Maintenance
- Terms of delivery
- Terms of payment

Do you purchase only air cannons or also installation and / or other possible services? Do air cannons suppliers provide guidelines on air cannon use for your personnel? How?

Opastavatko siilotykkitoimittajat henkilökuntanne siilotykkien käytössä? Miten?

Do air cannons suppliers arrange trainings?

What are three most important factors for supplier selection (quality, price, service quality)

Please put them in order 1. The most important 2. Less important and so on.

Kuinka pitkä takuu toivotte siilotykillä olevan?

## **Company and industry prospects**

Are you satisfied in the effectiveness of air cannons?

Do you think that air cannons do not solve your problem, but there is no any other option exist?

Will you continue to use air cannons in your production processes in the future?

## **Appendix 5 a. Interview guide for the buyers(in Finnish)**

### **Yritys ja sen asema markkinoilla**

Mitä teollisuusalalla Yrityksenne toimii?

Kuuluuko tuotantoprosessiinne bulkkimateriaalin varastointi ja säilytys siloihin tai bunkereihin?

Mitä materiaalia siloksissa säilytetään?

Onko silojen tyhjentämisen yhteydessä esintynyt materiaalitukoksia ja –virtaongelmia (holvausten ja siltojen muodustumista, seinille kiinnittämistä ym.)

Oletteko käyttäneet pneumaattisia siilotyökaluja silojen tyhjentämiseen?

Oletteko koskaan käyttäneet muita kuin pneumaattisia ratkaisuja materiaalivirtaongelmiin?

### **Kilpailu**

Kenen valmistajien siilotyökaluja olette käyttäneet tähän mennessä?

Mistä seuraavien valmistajien siilotyökaluista teillä on kokemusta tai käsitystä:

- Martin Engineering
- Standard Industrie
- Pneuplan
- Olivibra Spa
- VSR GmbH
- VIBCO
- Pulsonic

Mitkä valmistajien merkkeistä arvostatte / ottaisitte käyttöön?

Ostatteko mielummin kotimaassa valmistettua tai maahan tuottua siilotyökaluja?

Miten suhtaudutte siilotyökalujen valmistusmaihin? Onko valmistumaalla vaikutusta siilotyökalun valintaan?

Ostaisitteko / ottaisitteko käyttöön siilotyökaluja jos ne ovat valmistettu seuraavissa maissa ( vastakaa kyllä / ei):

- USA:ssa
- EU:ssa
- Asiassa
- Venäjällä

Onko muita teknisiä ratkaisuja silojen tyhjentämiseen, joita voitte käyttää

tuotantoprosessissa siilotyökalun sijaan? Mitkä ne ovat?

Onko tapauksia kun sekä siilotyökalu että kilpaileva ratkaisu saa käyttää. Miten teette valintanne silloin?

### **Alan markkinoiden rakenne**

Keneltä tilaatte siilotyökaluja Yrityksenne tarpeisiin?

- Suoraan valmistajalta?
- Maahantuojalta?
- Rakennuttajalta?
- Muulta taholta?

Ovatko siilotyökalujen toimittajat aktiivisesti markkinoimassa tuotteitaan vai joudutte itse ottamaan yhteyttä toimittajiin tarpeen esiintyessä?

Mitkä vaiheet kuuluvat siilotyökalun hankintamisen prosessiin tarpeen todettamisesta siilotyökalun ostamiseen?

Ketkä kaikkia Yrityksestänne ovat mukana prosessissa (esim. tekninen päällikkö, hankintapäällikkö, tuotantopäällikkö ym.)?

Kenen mielipiteillä on vaikutusta ostopäätökseen?

Kuka tekee loppullisen ostopäätöksen?

Millä kriteereillä valitsette siilotyökalujen toimittajan? (esim. tuotteen laatu tai hinta tai toimitusajat tai lisäpalvelut)

## **Tuote**

Mitkä ovat siilotykkien tekniset ominaisuudet, joita käyttäjänä arvostatte eniten?

Mitkä ovat tekniset vaatimuksenne ostamillenne siilotykeille? Vaaditteko pakollisia

- teknisiä testejä, minkälaisia?
- laatujärjestöjen sertifikaatteja, mitkä?
- Muita asiakirjoja? Mitkä?

Mitkä ovat vaatimukseenne siilotykeille työsuojeluun ja/tai laatujärjestelmään suhteen?

Vaaditteko mitään sertifikaatteja, standardia ym. siilotykkien mukaan?

Mitä toivotte siilotykkien toimittajalta liittyen:

- Toimitusaikaan
- Palveluun
- Asennukseen
- Huoltoon
- Toimitusehtoihin
- Maksuehtoihin

Ostatteko pelkästään siilotykin vai myös asennuksen ja mahdolliset muut palvelut?

Opastavatko siilotykkitoimittajat henkilökuntanne siilotykkien käytössä? Miten?

Jarjestävätkö koulutuksen?

Mitkä ovat kolme tärkeintä tekijää, joiden perusteella valitsette siilotykkien toimittajan

(esim. laatu, hinta, palvelu kokonaisuudessa). Laittasitteko ne tekijät tärkeysjärjestykseen

1. Tärkein 2. Vähemmän tärkeä jne.

Kuinka pitkä takuu toivotte siilotykillä olevan?

## **Yrityksen ja alan tulevaisuus**

Oletteko tyyväisiä siilotykkien työn lopputuloksiin?

Oletteko sitä mieltä, että ratkaisu ei vasta tarpeisiinne, mutta toista ratkaisua ei toistaiseksi ole löydetty?

Jatkatteko siilotykkien käyttöä tuotantoprosessissanne tulevaisuudessa?

## **Appendix 6. Interview guide for suppliers**

### **Company and its position on the market**

Are you familiar with air cannons solution for material flow problems?  
Have you ever supplied your products to be a part of air cannon equipment?  
Can you estimate percentage of your product sale for air cannons assembling?

### **Competition**

Whom you consider as competitors?

### **Industry market structure**

Who are your customers?

### **Product**

Are there any technical requirements for producing components for the air cannons?  
Are there any standards, quality management, test, certificates required for air cannon components?  
What are usual terms and conditions for the supplied components (delivery terms and time, warranty, reclamation terms, terms of payment)  
Are there any special terms and conditions of sales of the components for air cannons manufacturing?  
What price / discount policies you have on the air cannon components?

### **Company and industry prospects**

How do you see the demand of air cannon components in future?



## **Appendix 6 a. Interview guide for suppliers in Finnish**

### **Yritys ja sen asema markkinoilla**

Oletteko tietoisia siilotykkituotteista?

Oletteko koskaan toimittaneet omat tuotteet siilotykkien kokoonpanoon?

Osaatteko arvioida tällaisten komponenttien myyntiosuuden kokonaismyynnistä?

### **Kilpailu**

Ketä pidätte kilpailijoina?

### **Alan markkinoiden rakenne**

Ketkä ovat valmistamanne siilotykkiosien ostajat?

### **Tuote**

Minkälaisia teknisiä vaatimuksia on valmistamillenne siilotykkiosille?

Minkälaisia standardia, laatuja järjestelmiä, testejä, sertifikaatteja mahdollisesti vaaditaan valmistamillenne siilotykkiosille?

Mitä ovat yleiset toimitusehdonne (toimitusaika, takuu, palautus- ja maksuehdot)?

Onko mitään erityisiä ehtoja siilotykkiosien myynnissä?

Mikä on hintapolitiikkanne siilotykkiosien suhteen?

### **Yrityksen ja alan tulevaisuus**

Miten näette ko. kysynnän muuttuvan tulevaisuudessa?

## **Appendix 7. Interview guide for manufacturer of substitutes**

### **Company and its position on the market**

Is your company seller of the flow material problems technical solutions?  
What kind of solutions you offer?

### **Competition**

Do you consider air cannons as a competitive solution?  
Can your product a completely replace the air cannons or there are areas, where solutions cannot compete?  
What are advantages and disadvantages of air cannons comparing to your product?

### **Industry market structure**

How big your target market is in Finland? What are industries or industry sectors it includes?  
In which industries in Finland your material flow problem solutions are utilized the most?  
Who are the customers? End users? Plants constructors? Others?

### **Product**

What type of the product air cannon is:  
- customized for every order?  
- stock product immediately ready for delivery?  
What are the most valuable features / attributes of your product from the customers' perspective?  
What is competitive advantage of your product comparing to air cannons?  
Is your product an ecological solution?  
Do you offer also installation, maintenance services in addition to the core product?

### **Future of the industry and company**

How do you see development of material flow problems solutions market in Finland?  
What are future goals of your company on Finnish market?

## **Appendix 8. Interview guide for new entrants**

### **Company and its position on the market**

What are company's goals towards positioning on the market?  
Target industries? Target sectors? Niches?

### **Competition**

Principles of competitive strategy?

### **Industry market structure**

Are you aware of the industry market structure, decision making processes and effective approaches?

### **Product**

Have you assessed suitability of air cannons you going to offer to the market?  
Have you considered competitive advantage?

### **Future of the industry and company**

What are future goals of your company on Finnish market?  
How do you see development of the international operations?

## **Appendix 9. Statutes of the pressure equipment sector**

The essential statutes of the pressure equipment sector of Finland and European Community.

### **Finnish statutes:**

- Act on Pressure Equipment (869/1999)  
URL:
- Decree on the Bodies Referred to in the Act on Pressure Equipment (890/1999)
- Decree on Certificates of Boiler Use Supervisors (891/1999)
- Decision of the Ministry of Trade and Industry on Pressure Equipment (938/1999)
- Decision of the Ministry of Trade and Industry on Simple Pressure Tanks (917/1999)
- Decision of the Ministry of Trade and Industry on Pressure Equipment Safety (953/1999)

### **Statutes of European Community:**

- Pressure Equipment Directive 97/23/EC of 29 May 1997
- Simple Pressure Vessel Directive 2009/105/EC

### **Guides:**

- Pressure Equipment Directive (PED): guidelines

## Appendix 10. Conformity assessment table

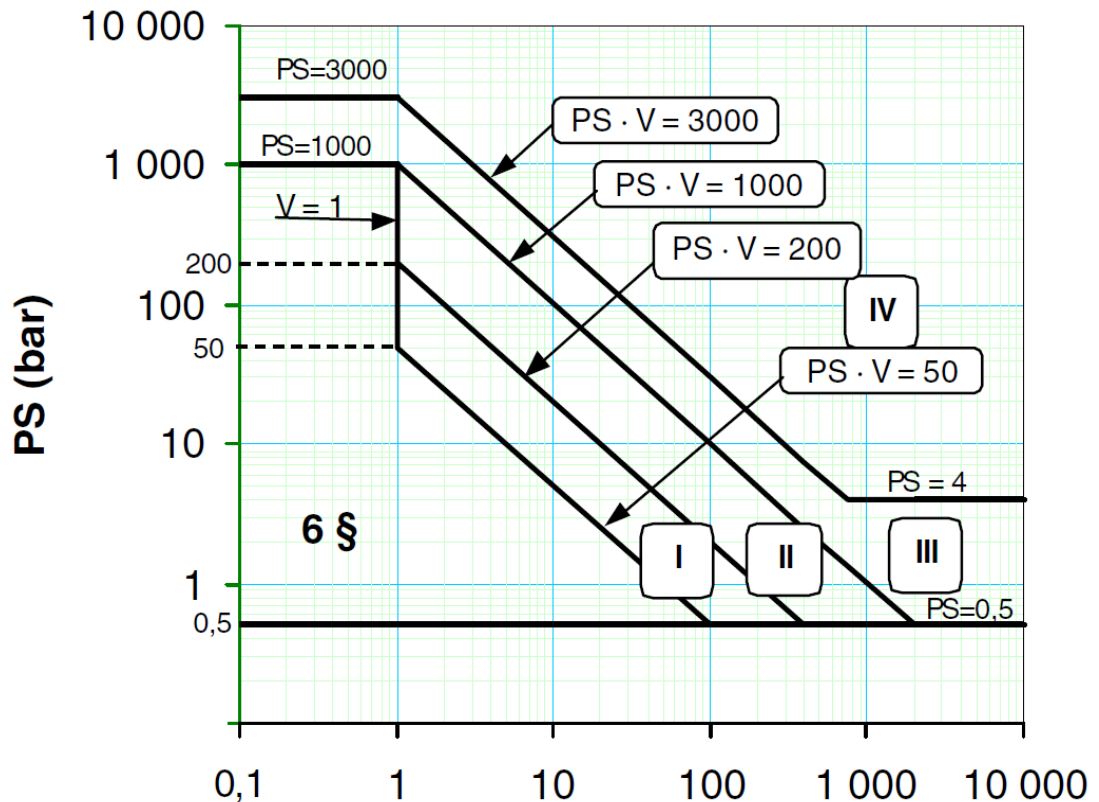


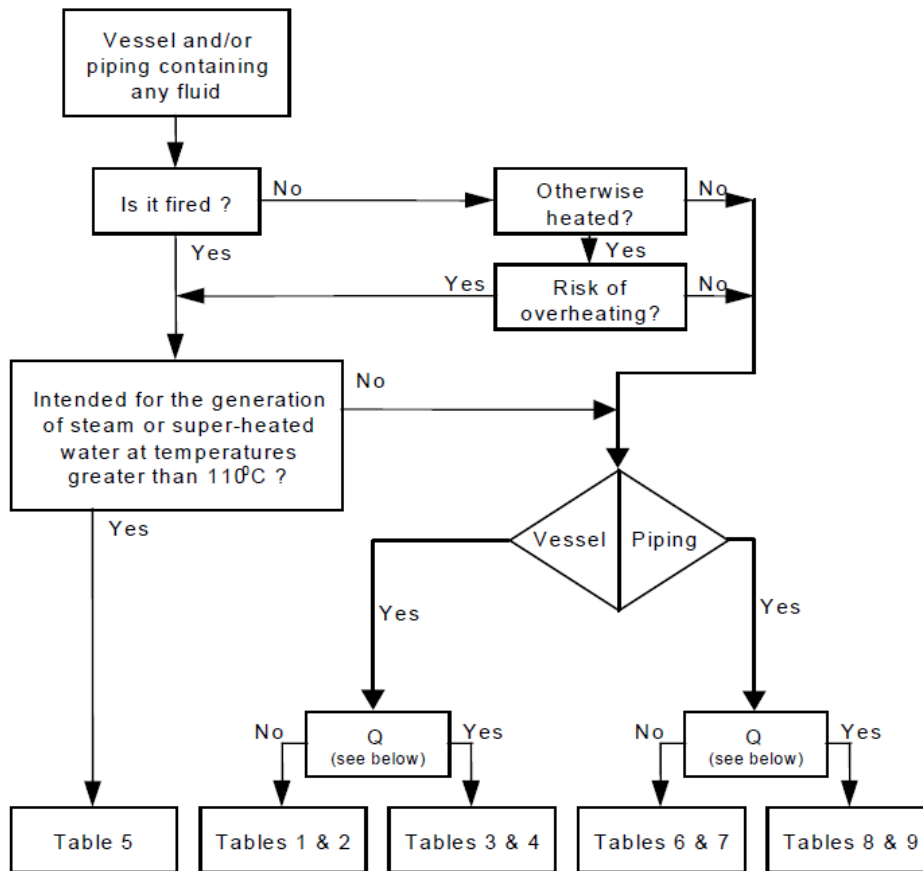
Figure 9. Conformity assessment table for determination of the category of the air cannon systems –type of the pressure equipment. PS = maximum allowable pressure measured in bars; V = volume of the equipment in liters; 6 § = equipment designed and manufactured in accordance with the sound engineering practice of Member State; PS · V = product of the pressure (bar) and volume (l) indicate the area of categories I, II, III, IV; demarcation lines indicate the upper limit for each category. (Attachment 2 of the Decision of the Ministry of Trade and Industry on Pressure Equipment (938/1999).)

Table 3. Defining the categories of the Company's air cannons in accordance to the applicable conformity assessment table (Figure 9)

Minimum allowable pressure (P)	6 bar	Maximum allowable pressure (P)	10
Minimum volume (V)	5 l	Maximum volume (V)	100
Minimum product of the pressure and volume (PS · V)	30	Maximum product of the pressure and volume (PS · V)	1000
<b>Category</b>	<b>6 §</b>	<b>Category</b>	<b>II</b>

## Appendix 11. Identification of Conformity assessment table

Step by step guidelines for identification of the appropriate Conformity assessment table  
(Pressure Equipment Directive (PED): guidelines, Guideline 2/13).



Q. Does the vessel or piping contain liquid whose vapour pressure at the maximum allowable temperature is not more than 0,5 bar above normal atmospheric pressure?

## Appendix 12. Notified bodies

Notified bodies accepted to monitor final assessments of the pressure equipment and approve quality system of manufacturer's processes in Finland.

<b>Notified body no</b>	<b>Organization</b>	<b>Website</b>
NB 0424	INSPECTATARKASTUSOY	<a href="http://www.inspecta.com">www.inspecta.com</a>
NB 0875	DEKRA Industrial OY	<a href="http://www.dekra.fi">www.dekra.fi</a>
NB 2545	InsteamOy	<a href="http://www.insteam.fi">www.insteam.fi</a>

(European Commission 2014)