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Field of Study: Management and Marketing of Foreign Trade

THE REQUIREMENTS ON PRODUCTS OF THE COMPANY SLOVPLAST MYJAVA, OJSC FOR EXPORT TO THE RUSSIAN FEDERATION

(Bachelor Thesis)

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ZADANIE BAKALÁRSKEJ PRÁCE

Meno a priezvisko: **Lukáš Kuba**
Študijný odbor: Management a marketing zahraničního obchodu

Téma práce:

Požiadavky na produkt pri exporte firmy Slovplast Myjava, a.s. do Ruskej federácie

Cieľ bakalárskej práce:
Cieľom práce je téma Požiadavky na produkt pri exporte do Ruskej Federácie od firmy Slovplast Myjava, a.s. V úvode práce vypracujte za pomoci domácej a zahraničnej literatúry teoretický základ danej problematiky. Charakterizujte spoločnosť Slovplast Myjava, a.s. V ďalšej časti práce analyzujte produkt spoločnosti. Analyzujte exportné možnosti firmy a navrhnite úpravu produktu. Stanovte kritériá, za ktorých by ruský odberateľ zaplatil za dodaný tovar. Vyjadrite prínosy navrhovaného riešenia. Bakalársku prácu obhájte pred vedením firmy Slovplast Myjava, a.s. a hodnotenie bude súčasťou bakalárskej práce. Bakalársku prácu podrobte testu z plagiátorstva, ktorý predložíte ako súčasť dokumentácie pri odovzdaní bakalárskej práce. Vypracujte príspevok na študentskú konferenciu alebo príspevok do odborného časopisu.

Osnova:
Úvod
1. Teoretický základ
2. Charakteristika spoločnosti Slovplast Myjava, a.s.
3. Analýza produktu
4. Analýza exportu
5. Návrh úprav produktu a návrat financií
6. Prínosy navrhovaného riešenia
Zaver

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I declare that I have prepared my Bachelor Thesis on my own, supervised by Ing. Martin ČERNÁČEK and that I have noted all used literary and professional sources in Bibliography.

Kunovice, 2012

I would like to thank Ing. Martin ČERNÁČEK for his very useful methodological assistance he provided me during the preparation of my Bachelor Thesis. I also would like to thank Mr. Peter KOLNÍK who provided for me technical information and valuable advice.

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Content:

INTRODUCTION

For centuries, mankind initially used just conventional materials. These included wood, iron or stone. Development began during this time. However, man came to gradually discover different substances until he discovered plastic materials. This industry thus began to develop with gradually increasing speed. The plastics industry before World War I produced only a few tons of plastic materials, but after World War I this production had increased substantially in the order of up to 50 000 tons. Huge production occurred after World War II, when there was already being produced more than one million tons of basic plastics. Since then, production has increased several times. Plastics have become an essential ingredient for almost all sectors of industry. Their excellent characteristics make it almost indispensable for some sectors. We can expect further development in electrical engineering, automotive, construction, engineering or agriculture. This industry is constantly growing and developing new substances with special features. Developing the production of new synthetic compounds becomes part of the new technological revolution. We can say that it is as important as the development of nuclear energy, or remote control of production processes.

Today the plastics industry is becoming an everyday part of our lives. Every day, man meets plastic products. Plastic can be found in almost every product of major dimension. Plastics have become produced in particular because there are sufficient raw materials for production, such as coal, oil, water, salt or river sand. In addition, plastic products are relatively light, compact and inexpensive.

It is possible to assume that the practical development of the basic types of plastics has roughly ended for economic reasons, because of their high production cost. The development is now focused on the improvement of or on the combining of the essential elements discovered so far. For example, we can expect development in increasing the productivity of individual equipment. The increase in industrial production has increased about three times, and chemical production has increased 20-fold. The development currently cannot be stopped.

This bachelor thesis, entitled the requirements on the product of the company Slovplast Myjava, Ltd. for export to the Russian federation will be dealing with the company Slovplast Myjava, Ltd.

The following descriptions will be about the technologies for the production of products, especially the production of elbows, T – units, reducers, sockets (couplings) end caps, pipe plugs and saddles.

This theme was chosen because plastics are everywhere around us. The company which is engaged in the manufacture of certain plastic products in the Slovak Republic is the company Slovplast Myjava, OJSC. It is a young company, founded in 2006. For this reason it offered opportunities for graduates, because in the past the company Slovplast Myjava, OJSC has given this chance for graduates to perform.

The first objective of this thesis will be to suggest the best solution for the manufacture of products of the type of copolymer polypropylene PP-R. The company Slovplast Myjava, OJSC is producing different products. The second objective of this work will suggest the best solution to reset the debts of the Russian company VneshTorgProm for the Slovakian company Slovplast Myjava, OJSC. The Russian firm did not to pay the full amount of all orders. If the solutions proposed in this thesis are selected for the firm Slovplast Myjava, than this would mean in practical benefits for the company Slovplast Myjava, OJSC as this would mean the return of funds and also the opportunity to invest in more modern technologies. The assumption of the proposed solution is suitable and sufficiently processed be the firm Slovplast Myjava, OJSC and could be used in practice. In the theoretical basis of the thesis the focus will be on the basic theoretical knowledge about the structure and properties of polypropylene copolymer, which is used to manufacture plastic piping systems for hot and cold water. The second chapter describes the firm Slovplast Myjava, Ltd., the company headquarters, history of the company, types of product and the theory of plastics manufacturing. The third chapter describes the process of manufacturing of the dosage material, labeling, fastening the pipes, combining different materials, methods of bonding, pressure testing and packaging products. The fourth chapter describes the figures of exports of the Slovak Republic to the foreign market and export of the company Slovplast Myjava, OJSC. The next fifth chapter analyzes the proposals made for the products due to more efficient manufacturing process of a copolymer of polypropylene PP-R. The last sixth chapter describes the benefits of the proposed solutions and what the future design solutions for the company Slovplast Myjava, OJSC will be, and how it will benefit management to use these in the practice.

1 Theoretical basis

Plastic was discovered in 1855. It was known as artificial ivory. The first synthetic plastic was created in 1909. After World War I, vinyl plastics such as polystyrene started to be produced. Plastic has a great advantage because it has very good properties and is relatively inexpensive. It has a little weigh and is relatively hard, durable and can be shaped. [1, p. 9]

Currently, the production of plastics uses the polymerization. This includes for example polystyrene. Plexiglas is polymethylmethacrylate. Plastics are made from petroleum, which is non-renewable resource. Estimated oil reserves are expected to endure for approximately 40 years. Plastics began to spread, because huge reserves of raw materials were available. The Guinness encyclopaedia says: *"Our knowledge of natural chemical compounds definitely overshadowed by the knowledge that apply to man-made or synthetic products."* [9, p. 54]

Scientists discover 5 new polymers on average every day. Many of these may not be used because of their consuming production requirements, high price or appearance. The aim is however a need for new quality materials with improved heat resistance, mechanical properties and resistance to severe conditions in practice. New materials can be obtained not only a new reaction, but often the treatment of existing polymers. This downplays the process and is so far more economical.

Oil refining process starts after salting out by distillation of crude oil fractions, which are always characterized by differences in boiling range. It takes place in the automatic refineries whose capacity ranges from 1 to 4 million tons per year. By crude oil processing is obtained over 20 simple primary chemicals, most of which are simple diolefins and olefins for example ethylene, propylene, butadiene and isoprene. [2, p. 53]

1.1 Characteristics of plastic

Plastics are not processed separately, in a pure state, but mostly by adding different ingredients. Impurities can be, for example: various fillers, lubricants, plasticizers, heat or

light stabilizers, pigments, antioxidants. These additions make it easier to process, protect against the harmful atmospheric effects or protect against changes of their basic characteristics.

Plastics are made from non – renewable resources such as coal, oil, water and salt or river sand. From oil is obtained about 20 000 different organic compounds. These substances are actually already on the production of semi – finished plastics. Decomposition of oil from the cracked gas produces methane, ethylene, propylene and many other plastics. One of the other known plastic is Bakelite, which is brown in colour. Some plastics react with other substances and thus have found application in other sectors. An example is acetylene. Scientists are still working on plastic research and try to improve its characteristics.

Plastics are actually materials that are composed of macromolecular substances. Its essence consists of substances such as natural or synthetic resins. Plastics can be formed using the heat and pressure. Plastics are dealt by chemistry of macromolecular compounds. Plastics can be composed by substances which molecules have a relative molecular weight. These may be substances which have the sum of the atomic weights of atoms in the molecule more than 10 000 and the number of atoms in the molecule more than 1000. [1, p. 11]

The difference between low – molecular and high molecular substance lies in the fact that in solvent, the molecules of low – molecular compounds are easily separated from each other and they are evenly spread between the solvent molecules. The high molecular substances dissolve fully slowly. Some substances may even be insoluble. They are viscous, dense and belong to colloidal solutions. Molecules usually have a chain structure. The length is a multiple of the size of the basic molecules of the substance contained in the resulting substance. Chain molecules can be very long, up to the order of one thousandth of a millimetre.

1.2 Division of plastics

Plastics are divided into three groups:

- Plastics of condensation products.
- Plastics of polymerization products.
- Plastics of natural products.

According to the behaviour plastics can be divided into two groups:

- Plastomers
- Duromers

Plastomers are change under the influence of heat and soften always. The advantage is that they are not chemically altered. A typical example is wax, which can be heated, processed and shaped without changing the basic characteristics of the material. Duromers become plastic under the influence of heat and can be processed and shaped. Further application of heat changes the chemical structure. As they cure, they become insoluble and infusible. [3, p. 13] Schematically, plastics divide by its behavior under the heat into two groups:

- Plastics fusible by heat – so called thermoplastics, soften under the influence of heat, melt and after cooling solidify again. Application of heat to soften is melt and cooling to solidify again. The heated thermoplastic chains cohesion is released and matter is thus viscous. The advantage is that this cycle can be repeated several times and still doesn't change any of its characteristics.

- Plastics curable by heat – so called reactoplastics, melt under the influence of heat, but further heating causes its change into infusible state. To create three – dimensional spatial network. Due to the hot melt and pressure is networking with plastic. Another heating, curing plastics pass into infusible state. When in curing temperature, chemical reaction and major changes of characteristics occurs. [2, p. 5]

In recent years, so called modified types of plastics are applied. These emerge by modification of the basic types of polymers. Characteristics are different from the initial polymer. Plastics have a large number of substances of different characteristics. Therefore it is not easy to divide them. Polymers can be only in liquid or solid state. According to the spatial arrangement of macromolecules, we distinguish crystalline or glassy. [2, p. 6]

1.3 Impact of chemical composition on the properties of plastics

Plastics are characterized by high resistance to corrosion. This was one of the reasons they become a popular protection material against corrosion of metals. Corrosion of plastics can be defined as unintentional change in their composition and properties caused by external conditions and leading to their deterioration. Corrosion can be caused for example by aggressive chemical reagents, environmental conditions, elevated temperature, microorganisms or ultraviolet radiation.

Plastics are usually exposed to the weather conditions. In this case, we can observe changes in appearance or the physical properties. Weather aging can be caused by sunlight, oxygen, temperature, water, moisture, sulfur or nitrogen oxides. The main reason is photochemical destruction and oxidation of macromolecules. [1, s. 8]

Impact on the properties of plastics can be more different ingredients. They improve the optical and mechanical properties. It can be additive powder filler, or fiber. Fibrous filler improves strength plastic. Other additives may be softening. It added to some of the hard polymer. Gain a better softness and flexibility. Furthermore, it can be even more colour, which also serves to achieve a particular colour shade. Stabilizers are other possible options are stabilizers that improve resistance to high temperatures during processing. The last way is to use a blowing agent. It allows the processing of gas release. It creates a cellular structure of plastic.

1.4 Plastics processing technology

Plastics processing includes a variety of operations, methods and processes. Technology is a production method that results in a product. Method of production consists of a set of work tasks, operations entered into by materials via machinery, labour and tools. Depending on the structure, plastics are in certain conditions elastic and rubbery. Over time, the processing methods developed. The processing methods mainly include plasticity, flow index, softening point and melting index. During the processing, it is important to determine specific heat and thermal conductivity of the material. That affects the demand for delivered heat, melt time and cooling time. Then it is important to ensure

thermal stability of the material. Thermal stability means that the material must be processed at lower temperatures. Such production requires a large mass and high power demands. This production is not very economical. It is important to heed the shrinkage of material to be reckoned with in the construction of forms. Negatively affects the appearance and quality of the product. Another important determining is the crystallinity of the material. It is important to heed the adhesion of the molten material to the form. It is necessary to keep the coating of the form in mind. The last important criterion is to pay attention to the reactivity of processed material. It is usually for duromers and it has major impact on the economy of production. These are the most important properties of plastics to be careful about in the process. All depend on the molecular structures and their characteristics. Based on the characteristics can then determine what technology is used for the material. Preparation of the product can be produced in the three processes:

- Discontinuous process – production is carried out at the same devices in continued time. The devices are filled with material and subjected to the manufacturing process. After the process the finished product leaves the device and the process repeats.
- Continuous Process – all stages of production take place simultaneously at the same levels of production conditions. Input consists of raw materials and from output is obtained, without interrupting, the finished product. Such technology represents high performance and high productivity.
- Combined Process – includes some of the stages taking place in continuous operation, and some taking place in discontinuous condition. [3, p. 49]

Continuous processes have certain advantages. They have the possibility of full automatization, obtain products with higher quality and work at a high efficiency, low investment costs. We can say that the continuous and discontinuous production begins to cope because they begin to implement flexible manufacturing systems. Processing technology can be divided into three groups:

- Basic procedures – output are materials that are also useful in other related or complementary technologies. This includes for example: grinding, separation, granulation, milling, grinding, mixing, rolling or extrusion. The results of the process are plastics, foils, tubes and many other products.

- Related technologies – processing intermediates, which are prepared in the basic technology and are ready to produce the final product. They have defined utility value, for example: injection molding, laminating, blow molding, extrusion or molding.
- Complementary technologies – used in the processing of intermediate products and finished products. This increases the utility value, for example: joining, cutting, machining, metallizing, surface protection. [2, p. 50]

Processing technology is distributed to processing technology of thermoplastics and reactoplastics. Alternatively, it may also be common ways for both types of plastics. According to effect are divided into forming, which represents a fundamental transformation of the blank and shaping, which represents only change the shape of semifinished product. Furthermore is divided into for example joining, forming a coating, cutting or cultivating the appearance of products. The way the plastics produced is listed in tab. no. 1.

Method of production	**Thermoplastics**	**Reactoplastics**
Forming	Injection. Extrusion. Blowing. Sintering. Cellular.	Injection. Direct pressing. Extrusion. Lamination. Layering.
Styling	Bending. Forming.	-
Jointing	Welding. Bonding.	Riveting. Bonding.
Dividing	Tooling. Sawing. Cutting.	Tooling. Sawing. Cutting.
Coating	Fluidization. Unloading.	Fluidization. Unloading.
Refining	Dipping. Spraying. Painting. Plating. Suppressing.	Dipping. Spraying. Painting. Plating. Suppressing.

Table no. 1: Overview of plastics processing technologies
Source: [3, p. 50]

Given technology can produce a product with the required economic and qualitative parameters.

1.4.1 Extrusion

Extrusion is a technology operation in which plastic is extruded into empty space. Because of that, reciprocating machines are used. These belong to forefront of the plastics processing machinery. Extrusion produces for example sheets, plates, pipes, cables or insulated wires. The principle of extrusion is that the hopper is filled with starting material, for example granules, agglomerated or powder substance and transported to the head while heating and pressing. In the transition zone, the mass is agitated and pressed. From output device passes into the forming head.

Worm screw extruder consists of individual parts which include: hopper, electric resistance heating, worm screw, thermocouples, pressure regulator, pressure sensor, breaker, casing, entrance filler zone, transition zone and exit zone. [14]

1.4.2 Pressing and extruding

This method of production is one of the oldest plastics processing operations. The bottom line is that the molding resin is inserted into the mold cavity. Exposed to heat and pressure, it melts and shapes into the molding shape. For extrusion, molding resin is inserted into the push – through heated chamber. In this form is transferred into the plastic state and by the action of the piston is forced into the heated mold cavity. In the heated form, the product takes the final shape.

The press is a machine that operates on the material. It consists of a stand, which is a fixed bed of the press. Against this table is active a mobile board, which is driven by the pressing force. It applied vertically. The fixed bed and movable board is secured the upper and lower part form. Presses can, according to construction, be stand presses; this means that the table is accessible from three sides. Then they can be column or frame presses with closed stand. According to way of creating a compression force, it can be mechanical; this means that the movement of board is controlled by the spindle, articular or eccentric

mechanism. Next there might be hydraulic presses. The bottom line is that the mobile board moves by the immediate exposure to the piston. According to operation are presses with non-automatic operation, semi – automatic and automatic operation. Presses can also be divided according to strength: Mechanical presses are mainly used in laboratories. They can be, for example screw or lever presses in combination with the jointed mechanism. They are used frequently for pressing of reactoplastics.

Hydraulic presses are used at higher compression forces over 1MN. They are used in compression of reactoplastics, glass laminates. The advantage of hydraulic presses is that the maximal pressing force can be achieved at any point of trajectories of the moving board. This is very important with frequent changing of pressing tools. Press with hydraulic ejection consists of framed stand, the ejection piston cylinder, double acting ejection piston, stationary table, ram, main double acting compression piston and hydraulic cylinder. [1, p. 72]

In the non – automatic operation, each work element is operated sequentially. It has a demanding work crew and is mostly used in laboratory presses. In the semi – automatic operation, the process runs automatically after the filling. The form is filled with tablets. Removing the molding and cleaning of form is performed by hand. In the automatic mode, the process is fully automatic. This was prompted by great efforts of manufacturers. Advantages of pressing are based in the fact that it allows maximum use of materials pressed at the exact dosage and good form design. Also, internal stress is minimal. Pressing is relatively easy to be automated. It is suitable for thin – walled pressings. As for weight, for pressings over 1.5 kilograms, it is preferable pressing like extrusion, eventually injection molding. One prominent advantage is the fact that the forms for pressing are cheaper than the forms for extruding and injection molding.

1.4.3 Shaping

This method involves the effect of forming force to the base intermediate form. When volumetric shaping, the shape of semi finished product is changing. Shaping is carried out at elevated temperatures. To molding belongs for example also injection molding or extrusion.

Shaping means forming method in which the force acts on an intermediate form, and does not any waste yet. It is used in the production of large products such as doors, cabinet refrigerators or car body parts. Shaping is economical and has wide application. Shaped may be only blanks of thermoplastic materials in the amorphous and crystalline structure. [1, p. 125]

Most commonly used for shaping are semi finished products, such as foils, thermoplastic prepregs or boards. Bending is also a way of shaping flat shapes. It is used in the construction of facilities for chemically stressed environment, the mounting technology, in piping or in the construction of apparatuses. The principle lies in that the area intended for bending is preheated to the bending temperature. The most commonly is used infrared heater of hot air. In needed shaping temperature, the semi finished product is bent to the desired shape using a ruler with the template of the internal radius and by leveraging the required part, it is bent to the desired angle. After cooling, the semi finished product remains permanently shaped.

Pulling is another way of forming. Blank is flexibly held to a form. The bottom line is that the force acting to pull the material allows flexible storage and slipping into the non – textured semi finished product to the molding area. Forming force can be formed by punch or pneumatic pressure by squeezing the air. Shaped intermediate form is pushed into the mold cavity. Products that are made by pulling have better proportion of wall thickness than those produced by vacuum forming.

Vacuum shaping is also the way of shaping, during the forming, material is firmly attached to the frame. The product is in a closed space in the form. During the shaping, air is pumped away and thus creating a vacuum space. The difference between vacuum and atmospheric pressure is the beam forming force. The molded product, especially when pneumatic, the material is inflated due to pressure to space and thus is evenly spaced out along the surface. Upon reaching the desired height, pressure is reduced, and under the semi finished product, vacuum occurs. The vacuum causes the latching of preformed product to the walls of form.

Methods of thermoforming consist of operations of the preparation of semifinished product blanks, blanks clamping, heating to a temperature of shaping, shaping, fixing the shape obtained in the form, collecting the product from the form and post-treatment. [3, p. 128]

1.4.4 Casting

For casting of products is used liquid resin. The principle of casting works by cast material is vented to produce products free of bubbles and with a quality surface. Highly filled resin affects the mechanical properties of the product. They are also cheaper, thus reducing costs. Form of the product may be cut or divided. It depends on the shape, flexibility, or hardness of the product.

After the casting of material, the product cures, or vulcanises. Temperature cures as needed. Some resins are cured only at higher temperatures. Amount of temperature also affects the robustness of the casting. For casting are used more complex materials than for conventional technologies. Centrifugal force generated by rotating the mold. The material in the form of is distributed by inner surface and thereby obtain hollow product. Forms are either split or solid. Forms are heated in a furnace or by induction. This reduces the time to gelatine. After filling the form, material goes to the heating zone, where the material is gelatined. By immersion in water or by spraying the mold is cooled and then opened. [1, p. 115]

1.4.5 Sintering

Sintering belongs to the production of simple and spatially segmented shapes by pressing and sintering. They are produced as intermediate products for further processing. They can take the form of plates, pipes, rods or prisms. They are designed to produce finished products. From them are produced such as foils, different products in the form of gears, track rollers, gaskets and various sealing cuffs. In particular, semi-finished products are drawn for the production of friction bearings. Plain bearings have self-lubricating properties. The contact layer of plastic is thin and sintering is mounted on a steel substrate. This product has applications in engineering, electronics, chemical and food industries. Sintering produces moldings with a high content of fillers. We can affect the accuracy of dimensions of product, thermal expansion or deterioration and durability. [3, p. 98]

Sintering is a technology that is still in development. The advantage of sintering is that it does not waste. Molded product does not have optimal properties, since it is brittle and friable. Alteration of properties happens after sintering. Sintering process is a condition

where the mold, the exposed to elevated temperature, which is slightly less than the melting point fabric, passes in such temperature to jelly-like state. For sintering, the grains with drench gel like substance, thereby combining the particles of the substance together. Finally, the product is cooled to normal temperature and after cooling has final product better mechanical properties. Sintering temperature regime requires a certain time course stages of sintering and temperatures.

1.4.6 Injection molding

Injection molding is another operation that is used in plastic processing. It allows production of particularly high quality and economically diverse enough products. The principle of the production lies in the fact that the starting material in the form of granules is melted in the melting chamber. The liquid plastic is injected by the piston at high pressure to a cooled form. After solidification of the molten plastic, the mold opens and spurt is removed. Injection consists of a plastification unit and injection unit, the closing unit and form. The basic parameter is the maximum injected volume burst. Spurt from the form is supplied directly to the consumer. Injection molding has many advantages. Accurate forms may eliminate further processing. Inlet residues may be grinded and reprocessed. The injection cycle is fast and can also be automated.

Even more efficient processing of molten plastic injection molding machine with is created by worm countershaft plasticizing unit. The device consists of: injection, compression, removal of burst from form, closing mechanism, movable clamping plate, block, former, stationary clamping plate, the injection cylinder, hopper, hydraulic motor to drive the screw, hydraulic cylinder, pressure gauge, the limit switch for pressing, limit switch of reverse screw displacement. [2, p. 107]

1.4.7 Rolling

Rolling, in foreign word calendering, is another process for the production of plastics. It is used to produce foils, upholstery or flooring and many other products. It also applies when applying plastic to the textile mats. The main component is calendering equipment. Calendering equipment alone cannot work and therefore it is necessary to supply with

preheated plastic or fabric. After processing, the product is treaded, extended, cooled and wound up. Calendering equipment works so that the gap between the cylinders is supplied from the roller belt. Part of entering belt passes a slot unchanged. The upper portion of the belt is levied and re-kneaded. The intensity of the kneading is affected by the difference in roller speeds. The roll accumulates excess mass that arises from each slit. The transition between each pair of rollers on film creates a new and better quality surface. The film gains quality, depending on the formation of rolls. Calendering machines can be, according to usage: two-cylinder, three-cylinder, four-cylinder or multi-cylinder. [3, p. 56]

1.5 Export to foreign markets

Exporting to foreign markets means export of company's products to the market in neighbouring or distant countries. To maximize a business's seek occupancy market in their products are not only domestically but also in foreign markets. Export companies have an advantage over companies that sell their products only in their home country. Enterprises Exporters goods to foreign markets are more successful, achieve a higher turnover, higher productivity, more sales and to gain more experience a review. The aim of any company is to maintain and to maximize their opportunities. The future seems is to be a large number of countries, it is possible to export products. Countries like Russian Federation, Ukraine, Turkey, Bulgaria, Romania, Croatia, Montenegro, and possibly the northern states, for example Estonia, Latvia and Lithuania. The possibility of exporting is to remote areas, for example in Canada, the United States, Mexico and Chile or even in Brazil, Egypt and United Arab Emirates.

In order to start business export goods, are not necessary to do some market research, but the specific area is in which in future would like to begin exporting products. One of the ways to do research is SWOT analysis. It's an analysis that helps identify strengths and weaknesses, opportunities and threats in the market. Based on this analysis it is possible to evaluate the functioning of the company. It allows you to identify problems and new opportunities in a specific market. The basis of this method is the exploration and evaluation of those factors. Based on the information the firm can obtain new information on foreign markets.

Today almost all countries are dependent on international trade. Each system is market driven by supply and demand. The effect of supply and demand decides the price of the product. Applicable Law, that if the price of the product increases, consumers stop buying the product. The decline in product prices again rising demand. If income rises, consumption rises also. Trading is two-way process, which includes import and export. International trade is trade in goods, e.g. agricultural production, industrial products and trade in services, for example revenues from air transport, insurance, or banking. International trade has many benefits. Individual countries can trade with each other as well as individuals, different regions of the company. In exchange, this achieves better efficiency. Export and import means a wider range of products in that country. It also helps to raise living standards in the country. Each country has a comparative advantage. This is due to differences in availability of factors of production. In 1947 was founded the General Agreement on Tariffs and Trade GATT. This agreement significantly reduced rates of duty. [8, p. 278]

1.5.1 Direct methods of Export

The way the business is to sell products in foreign markets, among the most important decisions. This means more opportunity for the company return because it does not pay commissions to various intermediaries. Export department is the manager for export to foreign market provides a variety of sales operations. Export department provides all export-related activities. It can operate as a separate profit center. It enables a wider range of sales in foreign markets. It provides distribution, storage and promotion of products. Salesmen, traveling and ensure exports are designed to seek business opportunities. Another option is hiring a representative company for the purpose of selling company products. The base entry for the foreign market is to have a license to sell the products in that country.

1.5.2 Indirect methods of export

Indirect export is the realization of export products through other persons. The bottom line is that the wholesaler buys goods from companies and then resells them abroad for himself

and his own account. Furthermore, it may be the export agent. It seeks to ensure that product sales in foreign markets. For these activities is then financially rewarded. Alternatively, indirect methods may be a cooperating organization. It carries out export activities for several manufacturers. This option is mainly used by companies that produce primary products, for example nuts. Indirect export method has some advantages. It requires a small investment. The advantage is that the company does not build up an export department. It does not have to focus on finding contacts abroad. The focus in this area is just intermediaries.

1.5.3 Risk of export

Exporting to foreign markets brings a lot of problems and risks. One of the biggest risks is whether the goods will be properly taken up and paid the price. Risks can be of various kinds, for example production risk. Backwardness of equipment can mean a reduction in profits for the company. The downside is the market and that a fall in sales of products, manufacturers are forced to reduce prices. Another major risk for the enterprise could mean selling risk. It is one of the biggest risks for the enterprise. Income is derived from the existence of the company. Many factors affect the price of the product, e.g. tariffs, providing unfavorable credit. A major risk is the insolvency, when the customer does not have funds to cover the product. Furthermore, it can be a non-delivery, failure to pay the purchase price, risk awaiting goods, customs risk, transfer payments and traffic hazards.

To prevent a company to certain risks, insurance is the best solution. The best option is insurance against all risks. It is the most expensive way of insurance, but also the safest. They encompass the assurance of food, for example to molly, rotting, decay. It is a form of insurance, which is the safest. The best option to prevent risks are carefully prepared and detailed purchase contract, which will include conditions for non-payment, failure to comply with established rules and sanctions in case of a breach in the contract concluded. Other such risks are traffic. To avoid the inconvenience and confusion, established the rules under which the buyer and seller oriented. This includes delivery items INCOTERMS 2010. They are internationally recognized rules governing the delivery of goods worldwide.

2 Characteristic of the company Slovplast Myjava, OJSC

Slovplast Myjava, OJSC deals with the production of components for Slovplast plastic piping systems for internal drinking water and hot water wiring, central and floor heating. Slovplast Myjava is a sister company of Slovarm, OJSC. It is a member of the Energy Group. The philosophy is that the company Slovarm produces brass products for water supply and heating distribution systems and Slovplast company produces similar products, but plastic.

Capacities of technologies are prepared for volume of production of 2 million euro per year. Currently these capabilities are used in Slovakia and in the Czech Republic. Efforts all employees of the company are focused on succeeding in foreign markets, which was partly limited due to the economic and financial crisis, particularly for the East (Russia, Ukraine). [10, p. 8] The company's management, in cooperation with the technical and commercial development, prepares technical and technological adjustments on products, input material and productivity of manufacturing in order to successfully enforce mainly in Poland, Russia and Ukraine. Currently the company has covered the Slovak market to 80 % and the Czech Republic about 10 %. [10, p. 13]

Company Slovplast Myjava, OJSC is relatively young. It was established 05/12 2006. It is located in Myjava, at the site of the former Myjava Valve Company (SAM). The company is at rather high technical and technological level. It owns new technology purchased from China. These new machines mean a huge growth for the company and the company thus competes with many other companies, not only in Slovakia but also abroad companies.

I would also mention that one of the leading advantages of large companies is that a company is headed by a Director who has many years of experience in manufacturing valves. Also, heads of the individual sections are at a high level of knowledge. The company has a well organized manufacturing process, which allows relatively quick production of individual materials within a given time. Perhaps the most important advantage to companies is that it produces quality products that provide up to 10 year guarantee and if any customer is dissatisfied or the product is defective, is willing to immediately replace the damaged goods. The customer thus feels absolute quality and reliability of the company.

2.1 Establishment of the company

From 2005 to 2006, there was a huge demand for goods, particularly valves, which continued to grow and there was increased demand for products that provide hot and cold water supplying, and products associated with the operation. Gradually it was visible the apparent lack of these products, not only in Slovakia but also in other states. For this reason, the idea to create a company that would actually ensured the production and sale of all components necessary for the distribution of water, whether hot or cold was established. The apparent growth of lack was reflected in the states of the Czech Republic, Bulgaria, Romania and in Russia. The company has its own philosophy, which includes:

- Customer satisfaction.
- High quality.
- Wide range.
- Competitive prices. [14]

2.1.1 Causes of the establishment of the company

One of the reasons why the company was founded, that the company continued the tradition of 70 years old production of valves, brass, plastic materials, toilet seats in the former SAM Myjava (Slovak armature Myjava). In the complex is performed production, repair and installation of measuring instruments, metalworking, manufacturing of instruments, metal grinding and polishing, locksmith, manufacturing of valves and fittings, manufacturing of accessories of road motor vehicles, manufacturing of machinery and equipment, manufacture of plastic products, design services in development, the implementation of various industrial buildings, maintenance and repair of double layer motor vehicles, alloying of ferrous and nonferrous metals, trade brokering, road motor transport, the national public cargo road transport , operation centres of calibration services, domestic freight forwarding, crane work, work of construction machinery. [13]

Another reason why the idea of creating of the company was expected rapid return on investment. The aim was to create a new, better products, production process, which will be more efficient, faster, better and also cheaper. Additional purpose was the maximum use

of freight by road, which was not fully excavated, owned by SAM, because cars were intended for distribution of magnesium, which is quite heavy and cars were overloaded and the cargo space was thus occupied to maximum. Another reason for creating the company was using the knowledge that personnel working in the house long ago have acquired by experience.

2.1.2 Types of products

The company manufactures various pipes and fittings made of high-molecular polypropylene copolymer PP-R Type 3. Each product has its mark by which we can determine the length and width of the product. A typical example is the label of the reduction: Reduction 32 x 25 Code: 22 3225. Number 22 is a group of products, such as adapters, tubes. Number 3225 reflects product dimensions 32 x 25 mm. [14]

Advantages of PP-R material:

- Extremely high durability.
- Hygienic cleanness.
- Resistance to chemicals.
- Resistance to corrosion.
- Resistance to Stray currents - non-conductivity.
- Easy and safe to work with the installation.
- Low weight and low cost compared to steel pipes.
- Eco-friendly recyclable material. [11, p. 19]

SLOVPLASTIK products are divided into the following groups:

- Group 01 to 04 Tubes.
- Group 09 to 10 Special features (crossing loop and compensation).
- Group 11 to 26 Plastic fittings (elbows, T pieces, adapters, sockets, plugs and stoppers).
- Group 27 to 54 Fittings combined with brass nickel-plated screw on the threaded joints.
- Group 55 to 57 Tube mountings. [14]

2.2 Details of the company

The company is focused on the production of components for plastic piping systems Slovplast for internal drinking water and hot water distribution, central and floor heating. The main objective of the company is to satisfy the customer in such a way that the company delivers quality products at the agreed time. The company is located in the region in which the production of plastic has a 40-year tradition. It is the site of the former SAM.

Information about the company:

- Trade name: Slovplast Myjava.
- Legal form: Joint Stock Company.
- Headquarters: kapitána Miloša Uhra Street 57 / 3 Myjava, 907 01.
- Establishment of the company: 5th December 2006.
- ID: 35769874.
- ID: 2020255083.
- VAT number: SK2020255083.
- Contact: 0910 856 300.
- fax: +421 34 621 6555.
- number of account: 1002454203/3100.
- IBAN: SK6731000000001002454203.
- Swift: LUBASKBX.
- Internet: www.slovplast-myjava.sk. [10, p. 4]

Slovplast Myjava, OJSC was actually a transformation of Via, OJSC Bratislava, which was established in 1999. The company was then renamed and 05/12 2006, moved to Myjava. Slovplast Myjava, OJSC bought new technologies. The company has three basic technologies for the production of plastic pipes. These are extrusion of PP-R pipes and STABY, pressing of fittings, fitting and packaging. The company has 13 number of employees and capital of the company is 66 390 €. [10, p. 7]

Composition of the company:

- CEO – Ing. Pavel Tokoš.
- Sales manager – Peter Kotvan.
- Mgr. Peter Kotvan – junior.

- Dušan Duga.
- Bc. Inna Dutková.
- Head of the technical section – Peter Kolník.
- Head of the production section – John Tomko. [10, p. 7]

Company Slovplast Myjava, OJSC is created with a dedicated focus on the production of PP-R systems that are commonly used in plumbing practice for several years. The basis of good company philosophy was to build on the analysis of the experience of competing companies that are producing PP-R deal. The fact that these companies financially firm cooperated closely was able to get a lot of information regarding the quality of the system. By choice of new technologies and advantage in the production process that has bought the latest high-performance extrusion lines for pipes and fittings chosen for the production of multiple forms of hot runner who work in automatic cycle for heavy duty presses. Investments correctly predicted to be lower if you choose fewer machines with multiple forms. After successful certification of the forecasts confirm a print competition managed mainly for domestic markets. The company currently imports already in 10 countries, mainly the European Union. The big advantage for the company was mainly experienced in fittings that previously dealt with the major European exporters as a manufacturer of brass components.

To help spread the risks of a business plan in 2008 the company began to cooperate on technology for our various business organized for new products that fall outside the trading portfolio companies Slovplast Myjava, OJSC but to fulfill production capacity, production facilities and financial help to cover overhead costs. This area is constantly growing, looking for other options and has proved very.

2.2.1 SWOT analysis

SWOT analysis is an analysis that reflects the strengths and weaknesses of the business opportunities and threats. It is a strategic planning tool. The analysis includes the monitoring of internal and external environment of the organization. Using the analysis can be expected future developments and also serves as a tool for achieving the objective.

Strengths:

- Quality modern technology EAGLE KR - PPR 63 H.
- Providing a variety of discounts on products.
- Quick delivery time.
- The ability to export products.
- Certified to EN ISO 15874.
- Certificate of Russian hygiene.
- Language proficiency, the ability to communicate in Russian, English and German.
- Cooperation with sister company Slovarm, as

Weaknesses:

- Lack of employees with university education.
- Failure to provide a price list on the website of the company.
- Inadequate remuneration of representatives of the company.
- Limited financial resources.
- Area firms in several buildings.
- The postponement of investment firms to edit objects.

Opportunities:

- Creating new markets and segments.
- External funding for scaling up production.
- Extensive involvement in the international exchange of knowledge and experience.
- Interest in products from abroad, particularly the Russian Federation and Belarus.

Threats:

- The impact of a continuous development of low-cost foreign competition (China, Taiwan).
- Obsolescence of technical and technological production.
- The unfavorable evolution of exchange rates.
- Declining sales in the former USSR.
- The outflow of labor as a result of opening the labor market abroad.
- Difficulty obtaining funding from the European Union.
- Negative effects of inflation on costs.

SWOT analysis is an essential tool for evaluating the state. It expresses the strengths, weaknesses, opportunities and threats. Expresses is the possible alternatives for future development, use in practice and problem solving. Opportunities and threats are external analysis, which focuses on the external environment. Strengths and weaknesses are internal analysis that analyzes the internal organization factors. The SWOT analysis is to evaluate the assumptions the company to carry out its business plan.

Strength of Slovplast Myjava, OJSC is that it owns advanced technologies such as EAGLE KR - PPR 63 H and KR EAGLE - PPR 63 P. These technologies have been purchased in 2007 and the performance is sufficient for the requirements of production of components for organic plastic piping systems for internal distribution of drinking water, hot water on the floor and central heating. The advantage of these technologies is the fact that the machine is adjustable to different diameters of 16-63 mm. Another positive aspect of the company is providing various discounts on products offered. The purchase price of goods is determined by the current price list. Prices are provided by the customer to the interest expressed in purchasing individual products. When you donate more goods company offers discounts of up to 10 % of that price in the price list. The advantage of the company is also the possibility of quick delivery time. It depends on agreement between buyer and seller by the time of delivery and the delivery method. The company is able to provide transport of goods to their destination to the final consumer. When export outside the European Union is governed by international INCOTERMS 2010. The business firm Slovplast Myjava, OJSC as to foreign markets is authorized to perform this operation. The company owns the Russian hygiene certificate awarded by the Russian authorities to the test company products Slovplast Myjava, OJSC. The Company is governed by the production of technical standard STN EN ISO 15874 for plastic piping systems for hot and cold water. One of the biggest advantages of the company is barrier-free speech communication, which allows you to communicate with Russian as a business partner to partner is speaking English or German speakers. Facilitates and saves additional costs for translation, interpretation and conclusion of negotiations, contracts of sale. Another advantage is also working with its sister company Slovarm, OJSC. The Company exists since 2000. With the company acquired Slovplast Myjava, OJSC and offers opportunities for foreign markets, the company has already exported Slovarm since its inception.

Weaknesses Slovplast Myjava, OJSC the lack of employees with university education. The basic phenomenon is the production of products has received training and courses. The management company is the number of employees with higher education only third-Technical Education, [10, p. 7] particularly higher education is a prerequisite for further positive development of the company into the future. Employees with higher education may also represent the company, which means an improved image for the company. Another weakness of the company is limited financial resources. It is the unfavorable situation in the corporate environment. Expresses is constraints on further actions and position on a market.

This risk can mean a threat to the position of the company. This may be in danger of failure or insolvency of the undertaking. Opportunities and risks are affecting the internal processes and organizational structure of the company at the same time. One of the weaknesses of the enterprise is a failure to price list on the website of the company. Price is an essential tool between buyer and seller. Another unresolved problem is the lack of firm salaries company representatives. Representatives have a great responsibility. Determine the running of the company, which will be produced as will be produced and for whom to produce. Using its other advantages, for example knowledge of languages, which are very important for communicating with a foreign partner. With advanced knowledge-firm managers also need to order and saves costly translators. One of the unfavorable characteristics of the distribution companies in several buildings. The disadvantage lies in constantly moving from one building to another. The problem is to know especially in winter. Weaknesses is delaying investment reconstruction and editing of objects, which the company owns.

Business opportunities appear in a positive future depends on us whether it will use its best efforts to market. One opportunity is to create new markets and segments. The company has a sister company Slovarm, OJSC because as opportunities to enter foreign markets, particularly in the Russian Federation. This country seems to be under-supplied market, in which the company has Slovplast Myjava, OJSC join. Another possible opportunity appears to increase the volume of production by foreign sources. These loans can be again divided by the length of repayment. They may be short-term loans, medium-term loans or long-term loans. The Bank may provide various types of loans, such as overdraft, loan discount, Lombard credit, acceptance credit. The long-term is loans, the Bank example mortgage. Another opportunity for business can be a strong involvement in international exchange of knowledge and experience. The more business communicates visits and works with other businesses, thus gaining more information. It is therefore beneficial for the

company e.g. visits to other companies through open day information sharing and comparing their products with other products produced by competitors. A great opportunity to enter the foreign market is presenting its products on which is primarily interested in the Russian Federation and Belarus.

Threats and influence the company in the daily order. They are influenced by various factors. Threat to business is a continuous development of low-cost foreign competition (China, Taiwan). In these countries, labor is very cheap, resulting in product prices are low, affecting the overall market and have a negative impact on producers in the European Union, the United States, Canada and many other developed countries. More and more pushes exported products of our manufacturers often produce below cost of production, resulting in a gradual our manufacturers. China becomes a world power and has a significant impact on the world market in clothing, electronics and machinery industries. Another disadvantage is the obsolescence of technical and technological production. The company must constantly monitor and adjust their marketing options. If the company would lose a general overview and manufactured products would remain outdated equipment could come over time to reduce the sale of products and the liquidation of the company. Threats are not only in the external business environment, but also in the internal environment of business. One of the most widespread threats is unfavorable evolution of exchange rates. It has resulted in a fully affects profits of the enterprise. The disadvantage is a constant exchange rate movement, which cannot be stopped. It can mean more profit for the company, but also a loss. Another threat to the enterprise may be the decrease of the former USSR. The decline may be due to an increase in competing companies, the price increase due to higher production costs, lack of funds or clients. The big problem now becomes the outflow of the workforce as a result of opening the labor market abroad. The foreign market is more advantage than in the domestic market, resulting in the emigration of young, but age and the elderly. One of the challenges is the difficulty of obtaining funding from the European Union. European funds can help to improve the production of products, to build facilities for the production. Funds from the European Union are to help finance those areas that your firm is not enough capital.

2.3 Cooperation of the Company Slovplast Myjava, OJSC with other firms

Company Slovplast Myjava, Ltd. was created in 2006. To complete the product range following to SLOVARM sister company, as which deals with production houses and apartment fixtures. Production Slovplast program is focused on hot and cold potable water. The development of trade was easier for the company Slovplast Myjava, OJSC could use the business network affiliated companies and the portfolio company's products Slovarm, as In the competition, the company had Slovplast, as from a wider range. In the Czech Republic and Slovakia, a total of 7 manufacturers who are focused on production PP-R systems. The manufacturers do not fight each other, but the business network. Slovplast Company, OJSC began to build their business through wholesalers. Wholesale include the major companies, they are also partners Slovarm, as which include:

- EMPIRE, Ltd. (Purchase of goods for sale to the ultimate consumer, retail or other trades - wholesale).
- SAMTEK, Ltd. (Wholesale and retail trade, sale of plumbing materials, sanitary ware, bathroom equipment).
- GAMA Chennai, Ltd. (Supply ball valves, filters, and products for water and gas).
- BIRD, OJSC (Heating, gas, water, bathrooms, utility lines).
- GIENGER, Ltd. (Wholesale - heating, sanitary installations and air-conditioning and distribution networks). [11, p. 33]

Since this competition was very strong, the company opted for smaller regional shops where the manufacturer with advanced technologies and higher productivity will have a chance to pursue. The market in the Czech Republic and in the Slovakia, there are eight major companies that produce products of PP-R system:

- Wavin Ekoplastik Company Ltd.
- FV Plast, OJSC.
- PIPELIFE SLOVAKIA Ltd.
- HP trend, Ltd.
- SANITAS Ltd.
- TITAN - PLASTIMEX Company Ltd.

- KUPEN GF Ltd.
- Slovplast Myjava, OJSC. [10, p. 35]

In Poland is operating some 14 manufacturers of PP-R material. It is also pushing for the European market firm Pestana doo Serbia, which also beats our European producers of PP-R. Slovarm Company, OJSC had long business relations with Eastern Europe. The expansion of PP-R products and started relationships with its sister company Slovplast, as the advantage of both companies was shared transport from one place. In addition, the firm has over 100 Slovarm contractual business partners in Slovakia and the Czech Republic 30 cooperation partners and export to 24 countries. The largest trading partner of Slovplast Myjava includes:

- Dispo-M, META-GAS, Ltd.; Brahama, Ltd.
- SA-Pehaes, Ltd. (Slovak Republic).
- PechaSan Ltd.; Gamanova Company Ltd., GEOS AGT, Ltd. (Czech Republic).
- Active, Ltd.; Gravity Ltd. (Hungary).
- MORO SA (Poland).
- Yavrit; Release (Belarus).
- VneshTorgProm (Russia).
- Dallas (Ukraine).
- Thermotrade (Bulgaria).
- Instaldack (Romania).
- Simradenci (Slovenia). [11, p. 43]

3 Product analysis

The company has very good market position, which success is based mainly on customer satisfaction. The problem of our age is not to make, but to sell products. Customers look at cost primarily, but expect mainly quality from the product. In my work I will analyze the type of pipe products. The pipe is a hollow circular object, respectively a path that has the task of delivering material to the target destination. The material is in liquid state. The pipe performs a protective function of the transported material.

To be able to promote the product on the market it must clearly meet all safety and environmentally harmless substances. Plastic tubes have the advantage of having excellent hydrodynamic properties. They have a smooth interior wall surface and resistance to corrosion and encrustations. In order to create the pipes, there should be set a plan under which the implementation will take place at the beginning. It is permitted to use only those materials are not damaged, that does not pollute environment and which are environmentally acceptable. However, no plastic components may come into contact with open flame. Temperatures in which pipe is located should not be less than 5 °C. All joints should be connected by fusion welding. For threaded connections are intended fittings with screw. Thread is seal by Teflon tape. Cutting of threads is prohibited. [11, p. 32]

3.1 Pipes - the title product

The company owns the most advanced technology to produce pipes. They make them from INNOPOL (trade name is PP-R material). From copolymer PP-R are produced mainly pipes, bends, T – pieces, adapters, sleeves, end caps, plugs and saddles. Due to technical and economic reasons, the pipes began to be favored in the production of plastic. They meet the same properties as brass products. In particular, production of plastic components is much cheaper. Currently, pipes are produced by four basic ways:

- Extrusion.
- Winding.
- Rotary casting.
- Sintering. [1, p. 174]

In terms of productivity and total production of pipes, the extrusion is on the first place. (see Annex no. 2)

At higher diameter and wall thickness is economically favorable winding of pipes. Sintering from powders is used only for a short, thick-walled pipes made from fluoropolymers. Pipes with large diameter and greater wall thickness are also produced by molding or also by winding of Plastomers plates by welding. These pipes are designed for low pressure systems, such as air conditioning or plumbing. Plastic pipes are quite demanded products in terms of production and use. In the production of pipes, certain manufacturing processes must be followed:

- Centricity and accuracy of the cross-section along the entire time of the production.
- Balanced quality of the material.
- Balanced wall thickness. [1, p. 175]

Production lines are very challenging in way of setting precise and continuous control. These requirements are even higher for those types that are completed by necks. Pipes have several types of production. Important is the pressure and medium temperature, which will be piped.

According to pressure, Plastomers pipes are divided to four series:

- Light series – up to 2.5 atmospheres of pressure, temperature to 20 °C.
- Moderate series – up to 6 atmospheres of pressure, temperature from 20 to 40 °C.
- Heavy series – pressure from 6 to 10 atm, temperature 20 to 40 °C.
- Very heavy series – pressure of 10 atm, temperature 40 °C. [1, p. 175]

These series are distinguished by wall thickness. Wall thickness variation is given a certain tolerance. Permitted are only plus variations. This means that the wall thickness cannot be lower than that specified. On the labeling of dimensions of pipes is always specified outside diameter, wall thickness and overall length. The inner diameters of tubes are calculated by the formula:

$$s = D – 2\ h$$ [1, p. 175]

D – Outer tube diameter indicated in millimetres.

h – Wall thickness of tube indicated in millimetres.

In addition to dimensions, pipes have also other important properties, e.g. internal stress. Less quality pipes have large internal stress. This can be proved so that when pipe shred for about 30 cm long rip in one place is cut, the pipe will show a tendency to roll and the walls overlap on cutting place. Pipes with internal tension get damaged by burden, bending or shaping. Important are also the mechanical properties, namely strength. Against its own strength, pipe which is placed between two supports, acts alone matter of pipe, internal pressure, mass of the transported environment, temperature and corrosion media effect. Thermal expansion is also of great importance in terms of installation. Coefficient of thermal expansion of PP-R is 1.5×10^{-4}. [1, p. 175]

Thermal extensibility is calculated using the formula:

$$\Delta l = \alpha \, . \, l \, . \, \Delta t$$ [1, p. 178]

Δl – change of length

α – thermal extensibility

l – Initial length

Δt – change per time unit

Using the formula can be calculated, for example, that 10 – meter pipe, when heated from 10 °C to 100 °C, pulls for 135 mm. Therefore it is very important how far the supports are apart. It is very important to not underestimate thermal expansion. Possible underestimation would ripple pipes and in extreme cases, cause the accidents of the system. The most common solution is a linear compensation of the external wiring by changing the direction. This means that the pipeline must be in a certain length freely movable. Therefore for fastening the pipe is used an friction fit. This ensures free movement in axial dilatation. [14]

Furthermore, also drain pipes and various types of large-dimensional beam pipes are made. In Europe, on the market are well known epoxy tubes. These pipes have a reinforced outer side walls with glass fabric and the inside is mirror-smooth, thus only from the resin. For very short distances can also be used loop compensation. Properties of the compensation loop are expressed in the in tab. no. 2.

Diameter d (mm)	Maximum extension (mm)	Recommended distance of fixed points for PP-R (m)	Recommended distance of fixed points for STABY (m)
16	90	8	24
20	80	9	27
25	65	10	30
32	55	12	36
40	45	14	42

Table no. 2: Compensatory capacity of loops and mounting
Source: [14]

Interesting is also that plastic pipes can be used for the floor heating. The prescribed temperature ranges up to 45 °C, and pressure is 0.3 MPa. [14] Operating conditions are carried out at the basis of calculations of thermal properties of the building and the desired output. Important thing is to precisely design pipe diameter and installation distance. Implementation may be done only if the project is approved, setting out all the required parameters. For laying of pipelines are used pipes, which are wound in a roll. The heating pipelines are placed in spiral and stored in to the ground. At the point of attachment or for any other location may not occur a mechanical damage of the material. When starting, it is important to set a pipeline to half of the operating temperature. Pipeline then takes shape, and it is possible to lay another layer of the floor.

3.1.1 Copolymer and polypropylene PP-R

These are thermoplastic materials. The reason for their production is that they are quite popular and are widely used. Polypropylene (PP, trade name is Tipplen, Moplen, Daplen or TATREN) is a thermoplastic polymer. It features a relatively good chemical and mechanical resistance. In 2001, the production of polypropylene was at about 30 million tons. Polypropylene was first produced in 1951. Polypropylene for expanding has already started to be produced in the 80s of the 20th century, known by the acronym PP-E. Polypropylene has better properties than polyethylene. It has the disadvantage that at low temperatures it becomes fragile. The chemical resistance of polypropylene depends on the temperature. It has relatively good resistance to oils, alcohol or organic compounds. [11, s. 9]

Among the advantages are for example: low weight, low cost, good chemical and corrosion resistance, better flow properties, good resistance to fouling, low electrical conductivity, low thermal conductivity, easier installation and repairs, lower costs for surface treatment. But there are also disadvantages, e.g. low thermal resistance, low resistance to internal pressure, worse mechanical properties, lower dimensional stability, lower resistance to physical impact and fire. Physical properties can be modified by vaccination by using the transfer reactions with other monomers. The purpose of for example modifications is improving in coloring or against impact. Polypropylene can be chlorinated, brominated, chlorosulfonated, chlorfosforylonated, vaccinated by vinyl monomers. [1, p. 21]

Polypropylene is processed by extrusion and injection molding. Machines are either monothreaded or multithreaded. The maximum temperature in the breakers reaches up to 240 °C. Limit temperature for maximum degradation is 300 °C. The temperature is gradually reduced and the hopper is around 170 °C. The temperature is lower so that premature melting of the granules does not occur. Polypropylene is used mainly in packaging, bottles, as fibers, industrial fabrics, corrosion resistant material, engineering or electrical engineering. It can also be used for moldings and cable insulation for pipes and pipe production. Basic physical characteristics are shown in the table. no. 3.

Characteristic	Unit	PP-R
Medium density	$Kg.m^{-3}$	0,905
Melt flow index (230 °C 2,16 kg)	g/10 min.	0,30
Modulus of elasticity	MPa	850
Strength of elasticity in tension	MPa	24
Tensile elongation of elasticity in tension	%	10
Vicat softening temperature (1kg)	°C	132

Table no. 3: Physical and mechanical characteristics of materials
Source: [14]

3.1.2 Technologies used for PP-R

PP-R pipes are manufactured by extrusion technology. Used are the following pressure Series S 5 (PN 10), S 3.2 (PN 16) and S 2.5 (PN 20) and in average diameter from 16 to 63 mm. Diameter indicates the value of the external dimension of the pipe. The wall

thickness of pipeline affects the used pressure series. STABI pipes are made of material PP-R, using aluminium foil pressure series S 2.5 (PN 20). [14] STABI is therefore a three – layer pipe. The inner layer is PP-R. This is followed by a layer of aluminium foil and at the end of the outer layer is PP-R. The aluminium foil provides a lower extensibility, higher stiffness and higher temperature and pressure resistance. Fittings are manufactured by injection molding technology in high-pressure line S 2.5 (PN 20). These pipes are widely used. They are used for:

- S 5 (PN 10) is used to supply cold water, which can be up 20 °C, such as under floor heating.
- S 3.2 (PN 16) is used for hot and cold water.
- S 2.5 (PN 20) is used for hot and cold water and central heating in residential buildings. [11, p. 18]

The pipe diameters are shown in table. no. 4.

Outer diameter of the pipeline (mm)	**Wall thickness (mm)**		
	S5	**S 3,2**	**S 2,5**
	PN 10	**PN 16**	**PN 20**
16	-	2,2	2,7
20	1,9	2,8	3,4
25	2,3	3,5	4,2
32	3,0	4,5	5,4
40	3,7	5,6	6,7
50	4,6	6,9	8,4
63	5,8	8,7	10,5

Table no. 4: Outer diameter of the pipeline and wall thickness (mm)
Source: [14]

3.2 Attachment of pipelines

Distance of pipelines when mounting is very important. Improper mounting could cause complications. Therefore, the distance from the individual clips determines the tab. no. five. The above table shows that, compared with steel pipes, plastic pipes require more mounting clips or brackets for secure mounting pipe. This is because the effects of rising temperatures, the plastic pipe expands and is thus essential that pipe was securely fastened.

Diameter d (mm)	Attachment distance depending on the operating temperature (mm):					
	20 °C	30 °C	40 °C	50 °C	60 °C	80 °C
16	750	700	700	650	650	550
20	800	750	700	700	650	600
25	850	850	850	800	750	700
32	1 000	950	980	900	850	750
40	1 100	1 100	1 050	1 000	950	850
50	1 250	1 200	1 150	1 100	1 050	900
63	1 400	1 350	1 300	1 250	1 200	1 050
75	1 550	1 500	1 450	1 350	1 300	1 150
90	1 650	1 650	1 550	1 500	1 450	1 250
110	1 850	1 800	1 750	1 650	1 600	1 400

Table no. 5: Attachment distance depending on the operating temperature for PN 10
Source: [14]

The above table shows that, compared with steel pipes, plastic pipes require more mounting clips or brackets for secure mounting of pipelines. This is because as effects of rising temperatures, the plastic pipe expands and is thus essential that pipe has been securely fastened.

3.3 Pipe Sizing

Every pipe has certain diameter and length. These characteristics affect flow of water in the pipeline. These characteristics are in tab. no. 6.

Type of pipe	Pressure series					
	S 5 (PN 10)		S 3,2 (PN 16)		S 2,5 (PN 20)	
	d x e (mm)	flow (l/sec)	d x e (mm)	flow (l/sec)	d x e (mm)	flow (l/sec)
1/2	20x1,9	0,59	20x2,8	0,46	20x3,4	0,38
3/4	25x2,3	0,94	25x3,5	0,72	25x4,2	0,60
1	32x2,9	1,56	32x4,4	1,20	32x5,4	0,98
5/4	40x3,7	2,42	40x5,5	1,88	40x6,7	1,56
6/4	50x4,6	3,80	50x6,9	2,94	50x8,3	2,46
2	63x5,8	6,05	63x8,6	4,72	63x10,5	3,90

Table no. 6: Maximum permeable flow per second at a flow rate of 3 meters of second
Source: [14]

From the table no. 6 shows that the pipeline is divided by the averages and where appropriate, the customer selects the appropriate pipe diameter to meet the purpose and the customer was satisfied at the same time. The larger the diameter, it moves more gallons of water per second.

3.4 Composition of pipes

The company produces pipes from PP-R material, which imports company PLASOCHEM Bratislava. Material must be stored in a dry place, without access to water and direct sunlight. It contains no harmful substances. Basic characteristics of supplied material:

- Producer: Inno-Comp Ltd., Tiszaújváros, Hungary.
- Supplier: PLASTOCHEM Ltd., Bratislava.
- Color design: Innopol CS 4 – 8 000 G grey.
  Innopol CS 4 – 8 000 N natural.
- Packaging: supply in the form of granules in 25 kg bags.
- Specific weight: 0.905 g/cm^3.
- Melt flow index: 0.2 – 0.5 g/10 min.
- Melting point: 130 – 150 °C.
- UV stabilization: no. [10, p. 45]

3.5 Product labeling

The products of Slovplast have detailed product label. Labeling is in accordance with applicable standards. Detailed description identifies the product and the manufacturer. Pipes have the basic data, which include the name of the manufacturer, material, diameter and nominal wall thickness, dimensional class, pressure series, application class with an operating pressure, standard, production site code, date and time of production. Fittings include labeling, which include the logo of the manufacturer, material, nominal diameter, pressure series and date of manufacture.

Pressure series of a pipe is highlighted by colour line along the length of pipe:

- S 5 (PN 10) no side line.
- S 3.2 (PN 16) blue side line.
- S 2.5 (PN 20) red side line. [14]

3.6 Products packaging, storage, handling and picking of goods

The products are packed in packages with descriptions and are accompanied by an identification label that contains the basic information. This includes the name of the manufacturer, product name, pressure series, material, quantity, or meters, production date and the identification of the person who produced the product. All products must be protected against the adverse effects of weather, UV radiation, and temperatures below 0 °C, the influence of solvents, chemicals, damage and contamination. Pipes should be stored on a flat surface in a horizontal position and the maximum available layer thickness of pipes is 1 meter. One side burdening and bending during storage is not permitted. Pipes in the disc can be stored for at least 0.1 m above the floor and up to three discs at each other. Storage rooms must have a minimum ambient temperature +5 °C and maximum 40 °C. [14]

The minimum distance from the heat source is 1 meter. Plastic fittings are stored in bags on pallets or loosely in cartons. Handling is necessary to protect products from damage. It is forbidden to throw or toss products. When handling the product, there must not occur any damage to packaging. Failure to meet these conditions means failure to recognize potential claim. [14] On taking up the amount of material is controlled, compliance with documentation, appearance, packaging or damage on material, random checks prescribed tolerance dimensions of products. Products manufactured by company of Slovplast to comply with relevant health and hygiene regulations. (see annex no. 5) Properties of pipes and fittings are listed in the chart. (see annex no. 3) Other parameter provides the durability table. (see annex no. 4)

3.7 Warranty and durability of products

The company provides its customers a guarantee for up to 10 years. When proven an error of material for one of the products, the company takes the responsibility for any damage running up to 33 000 Euro. In order to exchange damaged goods, following conditions must be fulfilled Installation of PP-R must be made to the approved project, It must be proven the products were made by Slovplast company, the installation must comply with the conditions specified in the installation instructions and Installation must be performed with the appropriate professional person authorization. [14]

3.8 Combining of products

For pipes to function properly and to fulfill its purpose, they must be properly linked together. The pipeline is composed of several parts which are connected together. Welding is permitted only for products of the same kind of material, namely PP-R with only PP-R. Fault is not considered when the piping consists of components from multiple vendors who supply the PP-R material. However, these products must comply with an applicable standard which has the name STN EN ISO 15874 (Slovak technical standard for plastic piping system). [10, p. 36] Combining different types is solved by joints. For joining with threaded fittings are used glands. All-plastic gland is designed for a pressure series S 5 (PN 10) for the cold water. For better sealing, hemp which is lubricated with grease is used. All plastic bushings are unsuitable for hot water. Fitting with metal screw is a perfect combination between plastic and metal. The metal screw is always cylindrical, not conical. It is therefore important to ensure that the cylindrical crossings were not connected with conical screws. [10, p. 37]

The most suitable material that is appropriate for the appliance is nickel plated brass. This ensures sufficient durability. Brass without surface treatment is inappropriate. It must not be steel, even if it would be surface treated somehow. For sealing DG screws is used Teflon sealing tape. The material is plastic, therefore the tools and used force should be adjusted when tightening.

3.9 Methods of connecting

The most common method of connecting is joining plastic with plastic. Connecting piping system can be welded in two ways, for example polyfusion welding and electro fusion welding. It is very important that the pipes were not connected by various glues. Butt welding is suitable for larger diameters. It requires accurate cutting of bonded parts. Axial compliance is also very important. The electro fusion welding is another way of welding. It is more expensive than butt welding. It is quite expensive and therefore used only in inaccessible locations, when removing of accidents where welder polyfusion cannot be used. Polyfusion welding is the most widely used method of welding of plastics. It is based on the mutual connection of the external surface and inner surface of pipe fittings. Before welding, the material is melted by polyfusion welder using the desired temperature. After welding the two materials, joint which has the same strength as the pipe occurs. Part of polyfusion welders are melting adapters. The surface of adapters is covered with and Teflon coating which prevents sticking to plastic.

3.9.1 Polyfusion welding

Preparation of polyfusion welding is very important. The adapter of certain dimension is firmly fastened to the welder and must not be loose. Teflon surface and welded element must be cleaned from any contamination. For cleaning and removal of impurities, the company recommends using TANGIT detergent. After turning the welder on, you should wait to reach the necessary temperature of 250 °C to 270 °C. Temperatures in the environment must not be lower than +5 °C. [14] It is important that the plastic top and middle layer of aluminium in the length of the neck which is inserted into the fittings, were removed from STABI pipes before welding. For more information determined the tab. no. 7.

Dimension of the welded parts (mm)	Length of the neck for polyfusion welding – h (mm)	Time of heating up the welded parts (s)	Time to insertion (s)	Fixation time of welded parts (s)
16	13,3	5	3	6
20	14,5	6	4	8
25	16,0	7	4,5	11
32	18,1	9	5	14
40	20,5	12	5,5	19
50	23,5	17	6	24
63	27,4	23	7	30
75	31,0	30	7,5	36
90	35,5	40	8	43
110	41,5	50	8,5	52

Table no. 7: Warm-up time and subsequent fixation of the connection
Source: [17]

3.9.2 Connecting of two materials and additional branches in the pipeline

After the time needed for warming (see tab. no. 7) jointed parts are withdrawn from the polyfusion adapter and are immediately retracted, without turning, by melted surfaces into each other. It is important to ensure that there was no deeper insertion of pipe than the value of h. This could result to rolling up the melted material inside the pipe and the flow reduction in the place where materials were melted. Fixation Time is the minimum time needed for homogeneous molecular joining of the two parts. When both materials are welded, welded parts must be fixed in a firm and unalterable position. Although welding is not that difficult and the procedure is quite simple, it is recommended that personnel have been trained for and completed polyfusion welding course. The company recommends welding course in Bratislava.

There may be the case when it will be necessary to establish the branch pipe. In this case, it is possible to create it with welded saddles. Branch may have a diameter of 32 mm, or a screw. Branches can be made into a pipeline that has a diameter of 63 mm, 75 mm or 90 mm. As a tool to be used is the drill to create a hole in the pipeline and special adapters to mold the saddle. In order to create manufactured goods in right way, it must follow certain rules and standards. These standards are the law of the Slovak Republic, which provides the following basic standard STN EN ISO 15 874. [11, p. 48]

4 Analysis of export

Market is the place where the buyer and seller have an opportunity to communicate and exchange goods and services, or resources. The core of the market is determined by supply and demand. They decide on the price, the quantity and method of production. Important is also to promote products, creating advertising that the customer has enough information about the products, for example as seen in the international literature from Mr. David Rachman and Michael Mescon in the book Business today. [6, p. 293]

Statistics of the Slovak Republic joining the EU is divided into EXTRASTAT and INTRASTAT. EXTRASTAT provides information on the exchange of goods to be exchanged with non-EU countries. Foreign trade development is influenced by economic, political and historical factors. Production was characterized by high production demands. After the fall of communism in 1989, Slovakia adopted the strategy of economic reform. These were processes that were used to create the conditions for establishing a market economy. There were a variety of measures, which included the release of pricing policy, the abolition of the monopoly of foreign trade, liberalization. The Slovak Republic joined the European Union on 1st May 2004, which marked a positive step to facilitate the export of products in foreign markets. Free movement of goods, services and capital allows increasing the production and marketing of goods. The cooperation with other firms is developing and the product range extends. Another benefit is the inflow of capital by increasing the purchase of modern technologies, drawing on EU funds. It also affects the free movement of person´s employment or even unemployment in Slovakia.

By clearing customs offices remained only the east border with Ukraine. Still it is difficult for export to Russia. If exports to the Russian Federation would continue to dominate, it is possible to get there only through the border crossing railway, such as Čierna nad Tisou a Maťovce or through road crossings and through Ubľa or Vyšné Nemecké. Goods can be transported to the Russian Federation also by air. It is possible from the airport of Milan Rastislav Stefanik, Košice, Poprad-Tatry, Žilina, Piešťany and Sliač. These airports are international and are entitled to landing and taking off aircraft to third countries. Slovakia is dependent on the international exchange of goods. The industry is mature and is forced to find outlets for their products abroad.

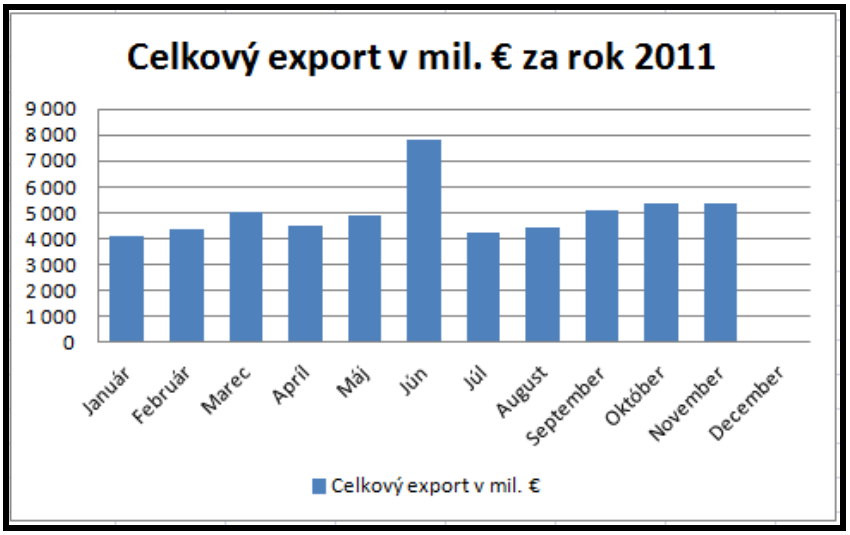
4.1 Evaluation of the export opportunities of the SR

Trade, especially foreign, is a key factor for the sharing of gross domestic product to the Slovak Republic. Foreign trade is an essential component of revenue. Statistical Office said the final details of foreign policy as the last in 2011. Slovak Republic exported goods in 2011, which we define in detail tab. no. 8.

Month	Total exports in millions €	Total import in millions €
January	4 077	3 834
February	4 375	4 192
March	5 023	4 831
April	4 509	4 486
May	4 922	4 815
June	7 796	4 599
July	4 256	4 228
August	4 444	4 270
September	5 108	4 722
October	5 339	4 740
November	5 339	4 994
December	-	-
Total value	52 146	49 709

Table no. 8: Total exports by months of 2011
Source: [19]; own processing

In 2011, the Slovak Republic exported goods totalling 52 146.6 million EUR. In comparison to 2010 it is 17.9 % increase. The most increased exports of cars and other vehicles for the transport of persons 1 492.9 million EUR. Parts and accessories of motor vehicles are for 386.9 million EUR. Telephone equipment total 477.8 million EUR, iron and steel of 141.7 million EUR. Exports recorded growth mainly to EU countries and a total of 18.5 % in OECD countries (Organization for Economic Co-operation and Development) by 17.9 %. Export records increase to the Russian Federation 5.9 %, Germany 24.7 %, Czech Republic 22.2 %, Poland 18.1 %, Austria 23.8 %, and France 11.3 % and in the United Kingdom by 14 %. [20] The total export of goods from the Slovak Republic is also shown in graph no 1.



Graph no. 1: Total export in 2011
Source: [20]; own graphic design

The economy recorded a negative development. Exports of products of broadcasting fell by 290.5 million EUR, telephone devices by 199.5 million EUR, and semi-finished iron by 141.7 million EUR. From January to November 2011 was a balance surplus at 2 436.7 million EUR. The largest balance surplus was the Slovak Republic and Austria 2 516.9 million EUR, Germany 2 479.3 million EUR and Czech Republic 2.127 million EUR. The final result for 2011, the Slovak Republic had active in a volume of 2 436.7 million EUR. [19] The balance for 2011 in each month is displayed in detail in tab. no. 9.

Month	Balance in millions EUR
January	244
February	183
March	192
April	23
May	108
June	197
July	27
August	175
September	386
October	599
November	304
December	-
Total	2 437

Table no. 9: The balance in each month for 2011
Source: [19]; own graphic design

The highest passive balance was in the Russian Federation 3 724.5 mil. Euro and the Republic of Korea is 3 055.5 mil. Euro. [19] In the Slovak Republic is many foreign investors who are involved in exporting goods. Tab. no. 10 displays the top 10 exporters in Slovakia in 2011.

Order	Name of the company
1.	SAMSUNG Electronics Slovakia Ltd.
2.	VOLKSWAGEN Slovakia, OJSC
3.	PCA Slovakia, Ltd.
4.	KIA Motors Slovakia Ltd.
5.	SLOVNAFT, OJSC
6.	U. S. Steel Košice, Ltd.
7.	Slovenské elektrárne, OJSC
8.	Mondi SCP, OJSC
9.	WHIRPOOL Slovakia Ltd.
10.	Slovnaft Petrochemicals, Ltd.

Table no. 10: Top 10 exporters from the Slovak Republic
Source: [19]; own design

In the Slovak Republic are approximately 9.400 exporters. Small businesses make up roughly 25 % of the total number of exporters. [19] Large exporters are mainly foreign investors. Total export exported from the Slovak Republic by Sections of Nomenclature for 2011 shows the tab. no. 11.

Sections of Nomenclature SITC	Export in million EUR	Import in million EUR
Food	1 967	2 535
Beverages and tobacco	105	348
Raw materials	1 388	1 790
Mineral fuels	3 382	7 379
Oils and fats	123	200
Chemicals	2 570	4 418
Market products	9 838	7 731
Machinery and equipment	27 522	19 630
Industrial Products	5 160	5 516
Other	91	162
Total	52 146	49 709

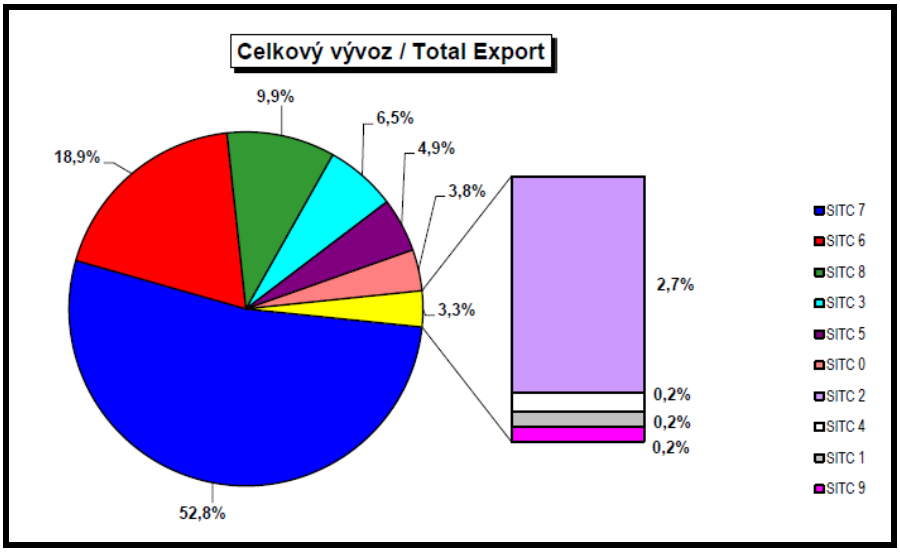
Table no. 11: Total export of goods by Sections of Nomenclature SITC
Source: [19]; own design

Imports and exports are divided into different classes. Total imports and total exports in million EUR by Sections of Nomenclature SITC for 2011 are shown in table no. 12.

SITC classes	Import	Export
SITC 0 Food	2 535	1 967
SITC 1 Beverages and tobacco	348	105
SITC 2 Raw materials	1 790	1 388
SITC 3 Mineral fuels	7 379	3 382
SITC 4 Oils and fats	200	123
SITC 5 Chemicals	4 418	2 570
SITC 6 Manufactured goods	7 731	9 838
SITC 7 Machinery and Equipment	19 630	27 522
SITC 8 Industrial Products	5 516	5 160
SITC 9 Other	162	91
SITC 0 Food	49 709	52 146

Table no. 12: Total import and export according to the SITC classes in 2011
Source: [19]; own design

Slovak producers are constantly trying to raise products on the market, especially foreign markets. Most managed to export, according to the nomenclature, class of machinery and equipment. These are primarily automobiles and their accessories. The group and the amount of exported goods in 2011, in % are also shown in graph no. 2.



Graph no. 2: Total export in 2011
Source: [21]

The graph shows that of the Slovak Republic exported goods up to seventh class of SITC. These are the products of machinery. Slovak economy continues to evolve in a positive direction for the future and further planned are expansion possibilities and types of exports.

4.2 Analysis of export to the Russian Federation

Mutual diplomatic relations with the Slovak Republic and the Russian Federation were established 1. 1. 1993. In 2011, the Slovak Republic has exported to Russia goods totaling 1 893.000 Euros. [19] During the period of 2011 Slovak Republic exported in the Russian Federation most motor vehicles, parts and accessories for motor vehicles, televisions, telecommunications equipment and accessories, medical equipment, pumps, iron, steel, compressors, fans, paper. Accurate data of the exported goods to the Russian Federation for the period of 2011 in each month are displayed tab. no. 13.

Export to the Russian Federation for 2011 in thousands of €	
January	117 877
February	141 722
March	160 947
April	147 785
May	201 674
June	180 984
July	176 080
August	137 094
September	192 702
October	226 012
November	209 769
December	-
Total	1 892 648

Table no. 13: The structure of total exports by months for 2011.
Source: [22]; own design

Economic development in Russia achieved a slight increase during 2011. The economy was also affected by the crisis and was expected to be recovering out of it quickly. Compared with 2010, grew up by 17.9 %. [22] It is expected that it will go even higher, which would have a positive impact. The main factor of economic growth through the export was high oil prices on world markets, growth of stocks and consumer demand.

Company Slovplast Myjava, OJSC is located in Slovakia and the goods stored in the company premises. The possibility of delivery means of applying EXW (Ex Works – from factory). The customer will come directly for goods to the company site up to a company premises, street kpt. M. Uher 57/3 907 01 Myjava, where he then collects the goods purchased.

4.2.1 Import and export regime of the Russian Federation

Import and export regime in Russia, the official name of the Russian Federation, which has an area of 17 million km^2 (square kilometer) and 145 000 000 million people, requires some procedures. Business relations with Russia are regulated by an agreement between Government of the SR and the Government of the Russian Federation on economic and scientific – technical cooperation. The agreement was signed on 25th February 2005 in Bratislava. Further cooperation regulation provides also a number of intergovernmental and interdepartmental agreements. Entry of Slovakia into the EU Slovakia also acceded to the treaties concluded by the EU with Russia several years ago. This includes for example Agreement on Partnership and Cooperation Agreement between the European Community and its Member States on the one hand and on the other hand, the Russian Federation. The EU has concluded with the Russian Federation, 19 bilateral agreements concerning trade and economic cooperation.

The basic understanding that governs the economic European Union's relations with the Russian Federation, is called the Agreement on Partnership and Cooperation Agreement between the European Community and its Member States on the one hand and Russia on the other (Partnership and Cooperation Agreement – PCA). This Agreement creates the conditions for establishment of free trade, provides contractual MFN and includes a specific regime of trade in steel and nuclear materials. The Russian Federation has adapted to such conditions as would have been a member of the World Trade Organization (WTO – World Trade Organization) and has committed to the approximation of laws with EU legislation, for example certification, banking, accounting, tax and customs law. The task is to ensure the protection of intellectual property and trade protection measures, helps to improve long-term solution to trade disputes and improving transparency in business relations. The main instruments of trade policy are import tariffs, which are governed by customs law. Description of commodity and classification consist of 11 032 tariff items.

Goods are charged with customs duty and 1 515 items are subject to mixed duty. 76 tariff items are subject to specific duties. This includes for example hard alcohol, beer and apples, chocolate. The goods are imposed by duty of 5, 10, 15 and 20 %. [22]

Slovak Republic exports mainly cars. From 11th January 2009 has changed import duty on cars to the Russian Federation. The import duty was increased to 30 % for cars with the exploitation duration 1 – 3 years, and 35 % for cars 3 – 5 years. Cars with the period of exploitation over five years have increased customs duties according to the engine capacity. It is from 2.4 to 5.8 Euro/cm^3 (cubic centimeter). Customs has increased because of temporary measures to protect domestic manufacturers of motor vehicles. At 1st January 2010, new customs code was issued, which contains 11 200 positions. [22] After the introduction of the tariff increase food products, and reduce the duty for medicines, home appliances, medical equipment and electrical equipment. Export duties are applicable to:

- Textiles and leather.
- Iron, steel and nonferrous materials, ferrous and nonferrous scrap.
- Wood – logs. [21]

4.2.2 Tariff and non-tariff barriers

The Russian Federation introduced a reserve certain goods, e.g. electronic products. Goods that originate in Asia cannot be exported from the European Union. Another problem arises between the authorities and legislation the Russian Federation. The State Customs Committee still issues secret regulations which are not published or made available to traders. This unevenness and inconsistency should be removed by entering the Russian Federation to the WTO. One other obstacle is the fact that all the goods that are included in the risk group should be checked not only at customs but also when loading goods in the exporter country. Checking the goods will be focused on price, coding, quantity and quality. Fees for inspection will be lower than one % of customs value of goods. In the Russian Federation is a breakdown of taxes on federal taxes and fees as follows:

- Value added tax.
- Tax on personal income.
- Excise (one form of indirect taxes on goods and services).
- Social tax.
- Tax from property.
- Tax on extraction of precious materials.
- Tax on profit of organizations.
- Fees for use of natural resources.
- Tax on water.
- State taxes.

Other taxes are regional, for example tax on the gaming business, transportation tax, property tax of organizations. Further still, there are local taxes, for example land tax and property tax on individuals. In addition to these taxes, there are even special tax regimes:

- The taxation of agricultural producers.
- The simplified tax system.
- The system of taxation so called single tax, revenues according to different types of activities.
- The system of taxation under the conditions of production of different types of production.
- Mandatory certification of tires, cars, cosmetics and cleaning products, electronic products including mobile phones.
- Licences to import medicinal products. [22]

In order for a manufacturer to export various kinds of products to the Russian Federation, certain criteria must be fulfilled. If you would like to export meat, meat products and dairy products, the manufacturer must have checks carried out and certified Federal management of sanitary and phytosanitary inspection. The manufacturer may not be imported into the country's poultry meat that has been treated with antibiotics. It must not import or live sheep and goats. It can import a limited number of cattle, dairy products and feed for dogs. It is prohibited to import cut flowers from the Netherlands and Estonia. Restricted imports of dairy products need certification for dioxin and radioactivity. [21]

4.2.3 Business conventions

The success of the business is based mainly on a good trader. It is very important that the trade is well organized. It's all about experience in the first place. It is not recommended to do business on your own, because it is very dangerous. Most entrepreneurs in Russia have a university degree and have experience and overview. If negotiation and conclusion of a possible trade it is needed to properly prepare information about their own society and business results. It is also important to have all the documents together, which might convince the seriousness of business cooperation. During the negotiations is not good to push, but let the business partner change their mind. Pressure, however, can be expected from the Russian partner, which requires reduction of the price, delivery conditions, various advantages or discounts. They refuse to cooperate with the exclusive importer and prefer to work directly with manufacturers. Price is important, but first quality, which will be appreciated by the Russian side. Each concluded agreement has a written record. Official language is Russian. As for us, so the younger generation in Russia operate world's two languages. Young people attend practice or education also in English speaking countries. Business meetings may be held throughout the year. The only exception is the first 10 days early. Russians begin work until after the new year-old after 14th January For foreign business is complicated and difficult to navigate in them and therefore it is recommended in case of no confidence to discuss your business partner with law firm procedures. Goods should be insured and have customs documents in order. Slovak carrier should have information on the types of transport permits as ATA Carnets (Admission Temporaire, Temporary Admission) do not recognize the Russian customs. [22]

4.2.4 Marketing strategy of export

Since 1935 the foreign trade legislation consists of agreements and treaties. Since 25th February 2005 an agreement on economic and scientific – technical cooperation applies between the Slovak Republic and the Russian Federation. Ministry of Economic Development and Trade of the Russian Federation is responsible for regulating foreign trade. Controls are performed by Federal Customs Service. The principles of state regulation of foreign trade, the Trade and anti-dumping measures, import of goods to the country, are regulated. When the Slovak Republic joined the European Union on

1 May 2004, the contract signed by the European Union, and the Russian Federation began to apply. It is the Agreement on Partnership and Cooperation Agreement between the European Community and its Member States on the one hand and Russia on the other (Partnership and Cooperation Agreement – PCA). This agreement paves the free trade zone and reaches deeper liberalization. The conditions also became difficult because of the visa requirements since 1. January 2001. Slovak manufacturers must continually face challenges and risks in the market, including:

- Strong competition from western companies makes work our a small business under their conditions laid down. This includes for example postponement of payments, regional distribution, and certification of goods.
- Heavy bureaucratic state system.
- Expensive advertising and publicity in the media.

Doing business on your own is not recommended because it is very risky and dangerous. Slovak Embassy in Moscow advised to contact the embassies of foreign legal entities which are allowed by accreditation issued by the Ministry of Industry and Energy RF Ministry of Economic Development and Trade of RF, RF Ministry of Justice, Commercial and Industrial Chamber of RF and State Chamber of Registration. Accreditation is granted for a period of one to three years. The advantage of accreditation is that the council is authorized to open a bank account in rubles. The customs duties or value added tax because of the not apply if the product is not intended for sale, but for example for the exhibition. Despite these advantages, the council must pay a deposit of customs duty, value added tax. This deposit is returned when goods are exported from the Russian Federation. It is thus established for protection. Each entity is required to register in the Commercial – Industrial Chamber of RF.

Regarding payment terms, the banking system recovered in 1998. In the Russian Federation are approximately 1 136 banks. Banks offer all types of payments, export and import letters of credit, and debit transactions and bank guarantees. The most preferred and safest way for Slovak companies as payment in advance. It is recommended to use letter of credit payments. It is the most common method of payment in international trade. Slovak Embassy in Moscow payment recommended by the Russian partner banks, which are among the first twenty Russian banks. It is possible to apply by foreign banks abroad.

Above all banks supervised by the Central Bank of the Russian Federation. In 2008, withdrew 15 licenses to banks that violate laws and regulations. [22]

4.2.5 Visa, mode of entry and residence in the country

The Slovak Republic is a member of the Schengen visa system. Citizens of the Slovak Republic are required to have visa when entering the Russian Federation. Exceptions are only citizens holding diplomatic and service passports. A visa is pending with the consular office of the Embassy of the Russian Federation, always on Monday, Wednesday and Friday from 9 hours to 12 hours. There are three types of visas, single, limited (two or three time) and multiple-entry visas that are granted to foreigners, who often visited the Russian Federation. Visas are granted for various periods of time limits, for example for a period of 90 days, or within 1 year. At each scheduled visit to Russia is required to submit the original invitation from the Russian side, the planned period of insurance, copy of travel tickets with accommodation. Based on this information, the consulate issues a visa. [10, p. 53]

Regarding transportation, so there are several ways to travel to the country. The safest and most convenient transportation way is by air. It is possible to travel lines of Austrian Airlines, Lauda Air, Aeroflot and ČSA Airlines. Flight from Vienna to Moscow takes 2 hours and 30 minutes. Upon arrival, one must pass through passport and customs control. The customs inspection is an obligation to declare all the funds. Customs declaration confirming the tax collector, then you can safely store. When leaving the country, it is forbidden to export foreign currency without permission. It must not be exported without domestic foreign currency certificates of the customs declaration. When entering the country the migration card, which a foreign citizen must complete, must be presented. Registration is done only for stays longer than 3 days. Registration by the Ministry of Foreign Affairs of the RF or hotels, where guests houses. It is very important because it is presented when leaving the country. Her left blank could be problems at the next entry into the country. Air connection is the safest and fastest, because all the major cities have airports.

The country is also possible to travel to by car. It is best to choose a route through Poland border Teraspol – Brest to Belarus and from there straight to the Russian Federation. The

road is very difficult and time consuming. Customs processing is slow and can sometimes take up to 30 hours. When you travel, company cars should be empowered to carry on the use from the organization. Moving around the country is free. When entering the country must be a valid passport and visa. After entering country we must register with local police authorities within 48 hours. If the visitor's own carrying amount greater than 10 000 USD (United States dollar) is required to report.

4.3 Evaluation of the export opportunities of the company Slovplast Myjava, OJSC

Management of the company Slovplast Myjava, OJSC at the very beginning when considering their export opportunities based on the current political situation and historical facts. Historically, the most acceptable territory for export is the Czech Republic, which currently exports account for more than 30 % of the production of the company Slovplast Myjava, OJSC. Advantage in the export, are contacts, relationships and there is no speech barrier. This export was given attention from the beginning, once the highest attention and exploit markets already acquired sister company Slovarm, OJSC since the range produced by Slovplast is also the installation character. Other management options seen in countries that have been historically close to the former Czechoslovakia, Hungary, Bulgaria, Romania, Poland and countries of former Yugoslavia. The markets know Slovak products, were satisfied with their quality and also use the relationships that were established in the past. Especially good is launched export activities to Bulgaria and Romania, but these activities have slowed in 2008, when the crisis occurred. Management of the company immediately tried as soon as possible to penetrate Eastern markets to the former Soviet Union. Export to former Soviet states has its own specifics and pitfalls to which management education once at the beginning and knew about them. [10, p. 37]

When exporting to Eastern markets, the most important is checking financial flows. Re-use of the contacts previously acquired by our sister company Slovarm, OJSC. Export to Eastern markets has even more pitfalls in tariff barriers, administrative barriers and compulsory certification of products, which are not easy, nor cheap. Severance export opportunities resulted from the fact that the market was occupied mainly by Italian and German companies.

Expansion of Chinese products to these markets occurred between 2008 and 2009, which could not be enforced in Europe overrun by the crisis. For these reasons, the possibility of export of the company Slovplast Myjava, OJSC was not faced with large export opportunities and costs that the firm would have to invest in acquiring these markets would be higher than would benefit from trade. Also, the firm very anxiously considered the risks that could arise in obtaining bad debts. These facts slowed all activity to recharge the Eastern markets, and more focused to markets that had already partially occupied.

4.3.1 Information on the exports of company Slovplast Myjava, OJSC to the countries of the former Union of Soviet Socialist Republics

Company Slovplast Myjava, OJSC exported goods to the Soviet Union in the total value of goods of 190 300 Euro. Overview of export of goods of the company Slovplast Myjava, OJSC to the countries of the former USSR since 2008 shows us tab. no. 14.

Year of export	Country of export	Total in €.
2008	Azerbaijan	7 277
	Russia	98 000
	Belarus	21 640
	Kazakhstan	1 000
	Ukraine	32 700
2009	Russia	1 600
	Belarus	10 000
2010	Belarus	182 000
	Estonia	8 300
2011	Belarus	161 000
	Russia	13 500
	Estonia	8 000

Table no. 14: Export of the company Slovplast, OJSC to the former Soviet Union
Source: [10, p. 51]; own design

From information about exporting in the table which company Slovplast Myjava, OJSC gave me it is visible that it confirms the facts described in the previous chapter, when in 2008 – beginning of year sales in the company Slovplast Myjava, OJSC were exported to the Soviet Union goods totalling 160 617 Euro and in subsequent periods in 2009 exports

dropped to 11 600 Euro, which represents a decrease of 92.78 %. In 2010, succeeded only in export activities in Belarus and in 2011 expanded the activities of Estonia. [10, p. 52]

4.4 Presumption of development of the company Slovplast Myjava, OJSC in the future

Company Slovplast Myjava, OJSC is very mature and prosperous business. For 2012, the outlook appears more export activities to Kazakhstan, Ukraine and Azerbaijan. In the first half of 2012 are scheduled negotiations to these countries. Management of the Slovplast has long been intensely devoted to expanding export opportunities to the former states of Soviet Socialist Republics. This is mainly because the crisis is now re-echoes in the European Union. This crisis affects only marginally the former Soviet Union, especially in Russia where he is strong support for the construction of houses and flats. The following are major challenges in building a stadium for the Olympic Games in the Crimea, where the promise of a Slovak company Slovplast Myjava, OJSC and in cooperation with the Czech construction companies will participate in the delivery of goods.

The export activities of plastic products are constantly engaged in business Slovplast Chennai, OJSC cost for the long haul. One of visions of management is to create a production commitment to the consumer. This would mean that in some countries of the former Soviet Union. In this regard, management is active in the creation of the factory with the Belarusian partners, where they had fallen tariff barriers, transport costs and administrative barriers. This project should be implemented in the second half of 2012. [10, p. 53]

4.5 Characteristic of competition

Slovak Republic in assessing of competitiveness ended on 69th place from 142 countries. This stems from the Global Competitiveness Reports for 2011, which shows the tab. no. 15.

Country	2011	2010	Change
	Position	Position	2010 – 2011
Switzerland	1	1	0
Singapore	2	3	+ 1
Sweden	3	2	- 1
Finland	4	7	+ 3
USA	5	4	- 1
Germany	6	5	- 1
Netherlands	7	8	+ 1
Denmark	8	9	+ 1
Japan	9	6	- 3
United Kingdom	10	12	+ 2
Czech Republic	38	36	- 2
Slovakia	69	60	- 9

Table no. 15: Index of competitiveness
Source: [19]; own design

Among the disadvantages of the Slovak economy belongs poor law enforcement, public confidence in politicians is low, the low efficiency of public spending. The competitive advantages are, in particular, that has a low tariff barriers, openness to foreign investment, low risk of terrorism. There are other companies on the market that compete with the company Slovplast, OJSC. These are for example. Schwer Fittings Ltd., Corex Pardubice, AVIMEX Hranice, Fluidtechnik Bohemia, Polnacorp, Armatury Špiral Ltd., AR Brno Ltd. and many other companies. In Slovakia, it is the company SLOVplast Ltd., which is located in Banská Bystrica in Slovakia. [10, p. 42]

5 Proposal for product modification and refund

All materials made from copolymer PP-R are very good and require very little modification. The only changes I would recommend is increasing temperature of the melt in a chamber with a current range from 210 °C to 230 °C. I would change from 210 °C to 250 °C for extrusion line type KR EAGLE - PPR 63 H and also the second extrusion line type KR EAGLE - PPR 63 S. Increasing temperatures will bring better melting possibility of polypropylene copolymer in melting plasticizing chamber and better movement, then where is mushy melt better conveyed by auger screw through the slot in the extrusion tool and pipe better so come out. The biggest problem of the company Slovplast Myjava, OJSC is the return of funds. Company Slovplast Myjava, OJSC has sold goods in Moscow, the Russian company VneshTorgProm based in Zatonaya 7/3 Moscow, ID 7725607317 and invoiced in 2008:

- Invoiced 20th August, goods worth 2,068 dollars, the total product weight 215.1 kg, with a maturity up to second October 2008.
- Invoiced 20th August, goods worth 13,785 dollars, the total weight of the goods 2 649.047 kg, with a maturity up to second October.
- Invoiced 10th September, goods worth 17,351 dollars, the total weight of the goods 3 101.856 kg, with a maturity of up to 10 October.
- Invoiced 5th September, goods worth 9,155 dollars, a total weight of the goods 458.9 kg, with a maturity of up to fifth October.
- Invoiced 6th November in the amount of 16,514 dollars, the total weight of the goods 3 832.501 kg, with a maturity of up to 7 December. [10, p. 29]

All invoices in 2008 reached goods for a total of 58 873 dollars. Due to not paying to the company Slovplast, the damage occurred and export froze in 2009 and 2010. Company VneshTorgProm should gradually repay the amount of each payment to company Slovplast, OJSC on account of Slovplast: 1002454203/3100, IBAN: SK6731000000001002454203 (International Bank Account Number) and Swift: LUBASKBX (Society for Worldwide Interbank Financial Telecommunication). VneshTorgProm Company has already paid part of their debts and to the date 1. 1 2011 owes the company Slovplast, OJSC even the final amount of 66 620 Euro. [11, p. 14]

5.1 Characteristics of the company VneshTorgProm

The company VneshTorgProm provides comprehensive building and finishing materials and tools for completing various construction projects. It allows customers different needs, so the customer does not have to look for and collect the necessary materials from different suppliers, located in different parts of Moscow and Moscow region. The company does not provide only materials, but also offers advice on use. The company gives customers the following types of goods:

- Tiles and porcelain.
- Sanitary ware.
- Floors, plaster ceilings.
- Mixes paints, foams, sealants, adhesives.
- Security doors.
- Various tools.

5.2 Suggested solution

Based on the results and analysis of the company suggests solutions problem of foreign debt, so that both parties were satisfied. Solutions to solve the problem are several, which would have satisfied both sides. There are several solutions, which could be achieve returning of the funds:

- Returning goods.
- Payment schedule.
- Continued trade.
- Purchase of goods and also paying for old goods.
- Legal enforcement.

The fastest solution would be an enforceable debt path. However, choosing this path would mean on the one hand solving the problem very quickly, but on the other hand, suspended trade relations in the future, which would mean the loss of the largest customer in the Russian Federation. Enforcement of law in Russia is almost zero. Slovak company

Slovplast Myjava, OJSC would not receive anything. In addition, trade between companies continues and still wants it to continue. This route is unlikely. Company Slovplast Myjava, OJSC has very good relations with Russian partners VneshTorgProm. These relationships wishes continue to maintain and therefore most advantageous solution to the problem appears to be schedule. These relationships wants to continue to maintain and therefore most advantageous solution to the problem appears to be schedule, distribution and amount of payments is precisely defined in the agreement to recognize the commitment and payment of the debt in installments specified in the Supplement 6.

5.3 New payment schedule

Slovplast Company started to export goods to the Russian Federation in order to increase sales and profits. However, since the Russian VneshTorgProm purchaser was unable to pay immediately, the solution lies in the payment schedule. Payment schedule, in which both companies agreed in 2009, is realized. But trade between firms continues. The claim was gradually reduced, but payment of the foreign partner was discontinued. Installments were preferred to other companies of the consortium of manufacturers and Slovplast Myjava in Myjava. The proposed schedule will be adjusted so that it could comply with the Russian company. Russian VneshTorgProm customer will pay according to predetermined schedule, to which both parties agree. The proposed schedule is as follows:

1. Payment paid by 31th July 2012 in the amount of € 8 150.
2. Payment paid by 31th August 2012 in the amount of € 12 318.
3. Payment paid by 30th September 2012 in the amount of € 13 785.
4. Payment paid by 31th October 2012 in the amount of € 15 014.
5. Payment paid by 30th November 2012 in the amount of € 17 351.

This calendar will enter into effect only after written agreement of both parties. It is therefore necessary to negotiate a draft bilateral agreement by negotiation or negotiation through diplomatic channels. If the company VneshTorgProm delayed payment in any way, the company Slovplast Myjava, OJSC is entitled to claim, after second reminder, a penalty of 0.05 % per every day late. Important role in international law have international treaties, which are considered as main sources of international law at present.

The international agreement is the conclusion of trade between two or more States or international organizations. After a long work of, the UN Commission successfully codified international law on diplomatic conference in Vienna in 1980. Party to international agreements can be any entity. The basic entity is constituted by sovereign States that have legal capacity to enter into such contract pursuant to Article 6 of the Vienna Convention.

In order to produce a contract, it must first be prepared thoroughly. Proposal for the conclusion of bilateral or multilateral agreements establish the coordinator of the central state administration bodies. Draft agreement must include political, economic and legal justification for the purpose of the contract, the proposal to negotiate a draft Treaty text, the proposal for decision on the contract. Draft Contract have to be sent to sponsor members of the government, central government authority and the Attorney General and Governor of the National Bank of Slovakia, if the award applies to them.

The conclusion of the contract goes through various stages. The contract becomes binding upon the State concerned. The first stage is to unite the will of States or other bodies of international law. The second stage is a summary of the acts in which States regard the contract as binding. After the conclusion of the agreement it enters into force. Ratification is a solemn confirmation of the contract that was negotiated and signed by the legitimate constitutional authorities of the State. International law does not have precisely defined categories of contracts which would require ratification. Approval of the contract is called the approbation. This means a simplified form of ratification.

Start of the contract set parties themselves, when or how the treaty enters into force. Contract provision does not come into force at the time of final approval of States bound by the contract. International treaties are registered and published. International bilateral agreements may be bilateral, and multilaterally trilateral and universally multilateral. [15, p. 270]

Contracts may even also be open, semi-open, semi-closed or closed. Open contracts are contracts that are universal in nature, or constitutional multilateral agreements to which all countries can join. Semi-open or semi-closed contracts are also agreements established by international organizations. Closed contracts are contracts to which other countries can not join. It is so in bilateral international treaties or multilateral agreements. International

agreements have a certain structure. The contract consists of three parts: introduction, called the preamble, the body of the contract and final part of the contract. The preamble of are parties, the names of Representatives and the motives that led to the conclusion of the contract and its goals. Own text contains requirements for the contract agreement. There are rights and obligations of the parties.

The final part of the agreement contains protocol articles that define the terms of the contract, for example period of contract, the possibilities and ways of extending, conditions and termination of the contract termination. The end date must be the conclusion, place of signing a contract. The signing of the contract takes place mostly where the contract is negotiated. The contract shall be made in duplicate and each party receives a copy in your language. Multilateral agreements are signed in alphabetical order of country name. Appendix international treaty may be, for example protocol, a variety of additional articles. For a contract entered into force, the parties must have capacity to conclude international agreements. [15, p. 275]

6 The benefits of the proposed solution

The proposed solution of temperature increase from 230 °C to 250 °C on extrusion line type EAGLE KR - PPR 63 H, which has a maximum suction pipe 20 meters per minute and maximum extrusion output 270 kg per hour for an average of 16 to 63 mm, but which does not crowding STABI PP-R pipes with aluminum coating. Increased temperatures will mean more melting material of copolymer polypropylene, which is then processed and extruded into finished products. Increase temperature to 250 °C is also positive for the extrusion line type EAGLE KR - PP-R 63 S, with a maximum evacuation of 6 meters per minute at STABI tubes and 20 m for PP-R pipes with a maximum output of 270 kg per hour and average 16 to 63 mm. This extrusion line extrusion supports STABI pipe with aluminum coating. If the proposed solution will be implemented, it would bring a Slovakian company Slovplast Myjava, OJSC better economic gains and faster process of production of PP-R material. Improved technical properties of products PP-R would improve and speed of working together with companies with whom the firm is already working. It includes:

- HKS Forge, Ltd.
- SLOVARM, OJSC.
- PREMATLAK, OJSC.
- Prvá teplárenská, OJSC.
- HOTEL SKALICA, OJSC.
- FIOR OJSC.
- GIS Skalica, OJSC.
- Reality SI, OJSC. [10, s. 12]

Another benefit of the proposed solution is the return of funds to the company Slovplast Myjava, OJSC from Russian company VneshTorgProm, to which the Slovak company has a long-term asset. This firm recognizes the Russian claim, but on an oral agreement between business owners, Russian firm prefers repayment of loans and advances to subsidiaries of Myjava consortium. Failure to pay for goods supplied by VneshTorgProm created financial difficulties for company Slovplast Myjava, OJSC. Debt incurred the 20th August 2008 after not paying the first invoice for goods equal to 2 068 dollars with a maturity of up to second October 2008 [10, p. 28], when the company sold the PP-R

pipes, grommets knee, neck, knees, outer pipe fitting, pipe fitting interior, T – pieces reduced, ball taps and valves, in the amount of 2068 dollars. Weight of the entire order was 215.1 kg.

Despite the outstanding invoices, the company VneshTorgProm ordered more and more goods totaling 58.873 dollars, which the company Slovplast Myjava supplied as required. This product is not paid a payment in advance and therefore, no claim against the contractor. The agreement of both parties will be valid for the new schedule. Payment schedule is suggested because the problem is resolved. Using this calendar to eliminate individual problems and remain a satisfied customer and supplier. This is the best way of solving problems while continuing to deliver the goods.

The benefits of the proposed action lead to reach the company philosophy, which reads in terms of customer satisfaction and business. I managed to propose a solution that would solve the problem and thus should company Slovplast Myjava, OJSC return money for the goods delivered to the Russian company in Moscow. Very good business relationship is currently prevailing between the Slovak Republic and the Russian Federation. In recent years occurred an increasing supply of goods, which had also resulted in a visit of Russian President Vladimir Putin in 2005. This year, he visited Slovakia as well as Boris Gryzlov, and in November 2006, held an official visit to the Slovak President Ivan Gasparovic in Moscow. All these official visits are accompanied by a group of businessmen from both countries.

Over the years of mutual cooperation, the Russian Federation and the Slovak Republic have become important trading partners. Russia is already the fifth most important trading partner of the European Union after the United States. In connection with the accession of the Slovak Republic to the European Union, the Slovak Republic is obliged to accept their rights with the obligations arising from EU membership. Trade relations of the Slovak Republic, as well as company Slovplast Myjava, OJSC provides exactly the Agreement between the Government of the Slovak Republic and the Russian Federation on the economy and scientific-technical cooperation, signed on 25th February 2005 in Bratislava. Shops also provides for the Agreement on Partnership and Cooperation Agreement between the European Community and its Member States on the one hand and the Russian Federation on the other. The European Union has a total of 19 bilateral agreements

concluded with the Russian Federation, which must the company follow. Solving the problem will mean for the company:

- Resetting the claim.
- Restoring and increasing volume of goods deliveries to the company VneshTorgProm.
- Investing in technology development.
- Finding new customers.

6.1 Resetting the claim

The company Slovplast Myjava began shipping to the company VneshTorgProm to Moscow, who gradually began to order. Difficulties arising from the Russian side has not been possible to pay the invoice in full, resulting in financial problems were also established in the company Slovplast Myjava. Despite financial difficulties, the Russian company even ordered more goods from company Slovplast Myjava, OJSC. The company also supplied more goods with that old products will be gradually repaid. At the end of 2008 the company stopped exporting goods to Russian company VneshTorgProm because of the large indebtedness of the company. Consequently, business relations were frozen for 2009 and 2010. The company has continued to get out from financial problems and been able to pay goods worth 10.503 Euro in 2010. The proposed solution is designed for calendar year 2012, marked the completion of the debt in the amount of 66.620 Euro to Slovak company Slovplast Myjava, OJSC. Debt Settlement will mean strengthening trade.

6.2 Investments, restoring the supply of goods to company VneshTorgProm

Resolving the large financial problems will mean a huge success for the company Slovplast Myjava, OJSC. The company will be able to further develop and invest the money in the purchase and development of new technologies that will mean an acceleration of production and the result will be more turnover and finance contribution to the company. VneshTorgProm Company had financial problems which resulted in the

Slovplast Myjava, OJSC Company suffered as well. To resolve the financial problems would mean great benefits for the future. Settlement of debt will mean thawing business activities and re-export to the Russian Federation in Moscow VneshTorgProm company.

6.3 Finding new customers

In order to be continually developed, company must have enough money and try to have no debt and have paid all the goods exported. Sufficient capital is invest in vehicles and look for other customers for PP-R goods. Presumably, after payment of all invoices, VneshTorgProm Company would be able to continue the company develop and build its market dominance. It is difficult to predict the exact future development, but it can be said that the company has opportunities to develop further in the following countries:

- Belarus
- Russia
- Ukraine
- Bulgaria
- Moldova
- Poland
- Romania
- Bosnia and Herzegovina
- Serbia
- Slovenia
- Kazakhstan
- Azerbaijan
- Turkey

The development of the future is not easy to predict, but as already mentioned countries as possible future business company Slovplast Myjava a territory, OJSC There are currently developing the diversification of the automotive industry, which is in the Slovak Republic widespread Company Slovplast Myjava, OJSC is a member of the Energy Group is and stable supplier of PP-R systems As a result of future development can be expected increase of the number of customers as the domestic market and on foreign markets. Some of our

business partners include such well known company DISPO-M, or META-GAS Company. The benefits of the proposed solutions will have additional advantages. Employees will provide various benefits such as:

- Quarterly bonuses.
- Rewards for 50 and 60 years jubilee.
- Corporate events, for example goulash party, Santa fun, social gatherings on the anniversary of the company.
- Teaching of English, various trainings and seminars.
- Contributions to cultural events.

Slovplast Myjava, OJSC company can provide all entries only if the company will report earnings and will be paid for any goods from a variety of customers in domestic and foreign markets.

CONCLUSION

The first aim of this Bachelor Thesis was to fill the gaps and design an optimal solution for the production of products for a plastic pipe system, consisting of tubes of different crossings, compensation loops, bends, T – pieces, adapters, sleeves, caps, plugs and tube plugs made of polypropylene copolymer type PP-R. The second aim of this thesis was to make proposals to recover financial claims from Russian customer company VneshTorgProm located in Zatonnaya str. 7/3 Moscow, for the goods delivered a total of 58 873 dollars.

This Bachelor Thesis deals with the company Slovplast Myjava, OJSC. It describes the processing technology of plastic components of PP-R, which are intended for internal distribution of drinking and hot water. Company Slovplast Myjava, OJSC belongs to very advanced companies in Slovak Republic, which is engaged in the manufacture of plastic pipe systems for internal distribution of drinking hot and cold water pipes for central and under floor heating. Great success has brought not only selling domestically, but also outside the territory of the Slovak Republic.

The company Slovplast Myjava, OJSC experienced the biggest success in 2010, when goods were exported to countries of the former Union of Soviet Socialist Republics goods totaling 190 300 Euro. The statistics released by the company Slovplast Myjava, OJSC show that in 2008 brought the goods into the former USSR totaling 160 617 Euro, in 2009 11 600 Euro, in 2010, 190 300 Euro in 2011 goods totaling 182 500 Euro. Currently the company has covered the Slovak market to 80 % in the Czech Republic, almost 10 %. Capacities technologies are prepared for output 2 million Euro per year.

The Slovak Republic is a small state and the market here is quite saturated. It was therefore necessary to apply to the foreign market. The purpose is to maximize the company opportunities in the European market and increase exports to Eastern Europe, particularly in Estonia, Latvia, Lithuania, Belarus, Ukraine, Bulgaria, Romania and Serbia. The company is focused on export to the Russian Federation. Increasing exports would mean an ever greater financial benefit to the company.

In the theoretical part, which is also the first chapter are briefly described characteristics of plastics, their distribution, effects of chemical composition on the properties of plastics, various plastics processing technologies and the use of PP-R materials in practice. The second chapter describes the characteristics of company Slovplast Myjava, OJSC as the cause of the company in the market, different types of products and detailed external and internal analysis of the company. The third chapter describes the analysis of pipes, the main product. It deals with the technical properties of production materials. It describes in detail fastening the pipe sizing, composition, labeling, packaging, storage, handling, durability and warranty of goods. In the fourth chapter is analyzed the development of foreign trade of the Slovak Republic, territorial and commodity structure of each month for the period of the year 2011. The data were used from the statistical tables provided by the Statistical Office of the Slovak Republic on their website of the Statistical Office of the Slovak Republic. The next information also drew from the Ministry of Finance of the Slovak Republic. Furthermore, this chapter focuses on the export of company Slovplast Myjava, OJSC, the foreign market and especially into the Russian Federation.

The task of this work was to fix the problem in the manufacture of products from polypropylene copolymer PP-R, from which are produced pipes, sleeves, knee grommets, T – pieces, various loop compensation, reducers, caps and plugs. Based on the analysis of the production process, I proposed a solution to the difficulty in manufacturing the products were resolved. In the case of election of the proposed solutions would work in company Slovplast Myjava, OJSC to achieve faster and better process for the production of products of PP-R. The biggest problem, which the company Slovplast Myjava, OJSC currently has, is the outstanding items from the Russian VneshTorgProm company based in Moscow. Slovak company Slovplast Myjava, OJSC supplied goods in 2008, totaling 58 873 dollars. Customer Russian company VneshTorgProm so far failed to pay the full amount. The task of this work was to solve the problem so that both parties were satisfied and re-thawed commercial relations in the future. Based on the agreement of both parties there was a meeting of Slovak companies Slovplast Myjava, OJSC with Russian company VneshTorgProm in the Czech Republic in 2009. Objective of the meeting of both parties was to solve the problem. Russian partner company VneshTorgProm recognizes their commitment to the company Slovplast Myjava, OJSC.

VneshTorgProm Company maintains very good relations with the Slovak company Slovplast Myjava, OJSC. Based on the orders of numbers 8/01/2008 N. 127, N. 125

8/01/2008, 08/29/2008 N. 144, N. 152 and N. 258 09/01/2008 11/02/2008 were issued for invoices VneshTorgProm 20th August, goods worth $ 2,068 maturing in 2nd October 2008, the next invoice issued 20th August, goods worth $ 13,785 with a maturity of up to 2nd October, invoice issued 10th September, goods worth $ 17,351, maturing to 10th October, invoice issued 5th September in the amount of $ 9,155, maturing to 5th October, invoice issued 6th November in the amount of $ 16,514, with maturity to 7th December [10, p. 36]. On the basis of the documents I have proposed a solution and created a new schedule for 2012. The proposed new schedule will be valid until a written agreement between the Russian company VneshTorgProm and the Slovak company Slovplast Myjava, OJSC will be signed.

To 12/30/ 2011, company VneshTorgProm owes Slovakian company Slovplast Myjava, OJSC sum in the total amount of 66 620 Euro. [10, p. 29] The proposed schedule is deployed for 12 months and always on the first day of the month, a Russian buyer must pay the required amount. If the Russian side was unable to repay a fixed amount on the required deadline, it would be possible to carry out further measures to try to find an appropriate solution by extending the payment plan.

Another possible alternative would be to continue to trade in the future. Russian buyer would continue to take other goods to the fact that the goods paid in advance. The last option, such as could be dealt with the problem is the enforcement through the courts. It is a very challenging way, he would elaborate and the solution is the costly. In case of removal of this road could mean the end of the suspension and the other business activities of the Russian side. It is a process that I would propose as a last way to solve because it would negatively impact the future of trade relations.

After the establishment of the Slovak Republic in 01/01/1993 new commercial and political relations started to be built. The stabilization of economic and political situation in Russia in the nineties allowed establishment of relations with the Slovak Republic. Deterioration occurred in 2008 when the crisis came, which occurred in the Russian Federation and the Russian ruble devaluation occurred. This decline in turn means a reduction in exports by nearly half. It was a huge shock for Slovak exporters exporting to the Russian Federation and also the company Slovplast Myjava, OJSC. Gradually, the situation stabilized in 2010 when the improved political situation, which had a positive impact on customers and the Russian and Slovak exporters. Improving the economy in

Russia is likely to increase for the future purchase of goods from the Slovak Republic.

The Slovak Republic joined the first May 2004 the European Union. Despite the entry of Slovakia into the European Union, the Slovak Republic has sustained interest in developing economic cooperation with Russia. Relations are governed by the Agreement between the Government of the Slovak Republic and the Russian Federation on economic and scientific-technical cooperation. The Slovak Republic became also part of a contract concluded by the European Union before the accession of Slovakia. These include the Agreement on Partnership and Cooperation Agreement between the European Community and its Member States on the one hand and Russia on the other. Overall, the European Union has concluded 19 agreements on trade and economic cooperation with Russia. Agreements to deepen trade liberalization between the EU and the Russian Federation were signed. Ministry of Economy seeks to develop effective and mutually beneficial ways for Slovak exporters. It focuses primarily on supporting small and medium enterprises. The country continues to remain a good relationship, which means export goods in the future.

It is a process very difficult and complicated because the company VneshTorgProm has invested heavily in a number and encountered financial difficulties in servicing debt. Reliability of business partners is provided by the proper functioning of the work of the Intergovernmental Committee of the Slovak Republic and the Russian Federation and the Joint Committee between the Slovak Republic and 23 regions of the Russian Federation. Presumably, if it finds a suitable way to solve the problem, the company Slovplast Myjava, OJSC willing to continue to maintain commercial relations with the Russian company VneshTorgProm.

Rating company

Hodnotenie podniku

Slovplast Myjava, a.s.
Ul. kapitána Miloša Uhra 57 / 3
907 01 Myjava
IČO: 35769874
zastúpená: **Petrom Kotvanom**, generálnym riaditeľom

Hodnotenie bakalárskej práce Lukáša Kubu, študenta Evropského polytechnického institutu, s.r.o. firmou Slovplast Myjava, a.s.

Hore uvedený Lukáš Kuba, narodený 14. 8. 1990, študent Evropského polytechnického institutu, s.r.o. v Hodoníne, odbor Management a marketing zahraničního obchodu, vypracoval bakalársku prácu, ktorej názov znie: „Požiadavky na produkt pri exporte firmy Slovplast Myjava, a.s. do Ruskej federácie“. Študent vypracoval bakalársku prácu pod vedením Ing. Martina Černáčka. Navrhol zmenu vo výrobnom procese vytlačovacej linke EAGLE KR – PPR 63 H a vytlačovacej linke EAGLE KR – PPR 63 S. Úpravou produktu pravdepodobne možno získať lepšiu roztaviteľnosť kopolyméru polypropylénu PP-R v taviacej plastifikačnej komore. Navrhované riešenie bude testované a v prípade osvedčenia sa zaradené do prevádzky. Študent ďalej navrhol spôsob riešenia nezaplatenej pohľadávky nášho ruského partnera firmy VneshTorgProm v Moskve. S týmto navrhovaným spôsobom riešenia problému súhlasí i management firmy Slovplast Myjava, a.s. Výsledkom bude použitie navrhovaného riešenia študenta v praxi. Úspešné vyriešenie problému by znamenalo návrat financií a tým možnosť ďalšieho rozvíjania nášho podniku.

V Myjave, dňa 16. 04. 2012

Slovplast Myjava a.s.
Kpt. M. Uhra 57/3, 907 01 Myjava
IČO: 35 769 874, IČ DPH: SK2020355083

Pečiatka a podpis firmy

ABSTRAKT

Lukáš KUBA *Požiadavky na produkt pri exporte firmy Slovplast Myjava, a.s. do Ruskej federácie.* Bakalárska práca. Evropský polytechnický institut, s.r.o. Kunovice

Vedúci práce: Ing. Martin ČERNÁČEK

Kľúčové slová: plasty, kopolymér PP-R, technológia, rúry, vytláčanie, vstrekovanie, extrúzia, kvalita, linky, zariadenie, norma, proces, výrobné linky a pohľadávky.

Cieľom tejto bakalárskej práce bolo navrhnúť také riešenie, pri ktorom by firma Slovplast Myjava, a.s. dosiahla rýchlejší a kvalitnejší proces výroby produktov z PP-R. Ďalším a zároveň najväčším problémom je vynulovanie pohľadávky od ruskej firmy VneshTorgProm, ktorej sa doteraz nepodarilo uhradiť plnú čiastku za dodaný tovar od firmy Slovplast Myjava, a.s. V teoretickom základe je popísaná charakteristika plastov, rozdelenie a vplyv chemického zloženia na vlastnosti plastov. Ďalej sú popísané jednotlivé technológie spracovania plastov. V druhej kapitole je analyzovaná charakteristika firmy Slovplast Myjava, a.s. jej vznik, príčiny vzniku a druhy ponúkaných výrobkov. V tretej kapitole je analyzovaný produkt. Zameral som sa na výrobu materiálu z kopolyméru typu PP-R. Podrobne je popísaný proces výroby, uchytávanie potrubia, označovanie, balenie, skladovanie, manipulácia, záruka a životnosť výrobkov. V štvrtej časti je analyzovaný celkový export Slovenskej republiky na zahraničný trh a celkový export firmy Slovplast Myjava, a.s. do krajín bývalého Zväzu sovietskych socialistických republík. V piatej kapitole je popísaný návrh úprav produktu a návrat financií pre firmu Slovplast Myjava, a.s. Posledná šiesta kapitola popisuje prínosy navrhovaného riešenia. Popisuje dôsledky na firmu Slovplast Myjava, a.s. a vzťahy s ruskou firmou VneshTorgProm.

ABSTRACT

Lukáš KUBA *The Requirements on Products of the Company Slovplast Myjava, Ltd. for Export to the Russian Federation.* Kunovice, 2012. Bachelor Thesis. European Polytechnic Institute Ltd., Kunovice

Supervisor: Ing. Martin ČERNÁČEK

Key words: plastics, copolymer PP-R technology, ovens, crowding, perfusion, quality, lines, equipment, standards, process, production lines and the claim.

The aim of this Bachelor Thesis was to propose a solution for the company Slovplast Myjava, OJSC, to achieve a faster and higher quality of products from the production process of PP-R. Another major problem was also how to reset the claim against the Russian company VneshTorgProm, who have so far failed to pay the full amount for the goods delivered by the company Slovplast Myjava, OJSC. In the theoretical basis there is described the characteristics of plastics distribution and the effect of chemical composition on the properties of plastics. It describes the various technologies for plastic processing. In the second chapter are analyzed the characteristics of the firm Slovplast Myjava, OJSC, regarding its origin, causes and types of products offered. In the third chapter are analyzed its products. I have focused on the production of the copolymer material PP-R, and have described in detail the production process, fastening the pipes, labeling, packaging, storage, handling, warranty and product life. In the fourth part there is analyzed total export of the Slovak Republic to the foreign market and the overall export business of Slovplast Myjava, OJSC, regarding the countries of the former Union of Soviet Socialist Republics. The fifth chapter describes the design of products and the financial return for the company Slovplast Myjava, OJSC. The last sixth chapter describes the benefits of the proposed solutions. It describes the consequences for the company Slovplast Myjava, OJSC and its relations with the Russian company VneshTorgProm.

Bibliography

Books:

[1] KOVAČIČ, Ľ.; BÍNA, J. *Plasty, vlastnosti, spracovanie, využitie.* Bratislava : Alfa, vydavateľstvo technickej a ekonomickej literatúry, 1974. 340 s.

[2] JAHNÁTEK, Ľ.; GROM, Ľ.; NÁPLAVA, A. 2005a. *Teória a technológia spracovania plastov.* Bratislava : STU, Vydavateľstvo STU v Bratislave, 2005. 188 s. ISBN 80-227-2256-1.

[3] CROMPTON, T.; R. *Analýza plastů.* Praha : SNTL, Nakladatelství technické literatury, 1989. 733 s.

[4] HARGROVE, M., M. *Successful Small Business Management.* New York : Arcata Graphics, 1988. 748 s. ISBN 0-256-05813-8.

[5] CIBÁKOVÁ, V.; BARTÁKOVÁ, G. *Základy marketingu.* Bratislava : vydavateľstvo Iura Edition, 2007. 224 s. ISBN 978-80-8078-156-9.

[6] RACHMAN, J., D.; MESCON, H., M. *Business today.* New York : Rand McNally, 1985. 643 s. ISBN 0-394-33629-1.

[7] HOLT, H., D. *Management, principles and practices.* New Jersey : Prentice Hall, 1990. 708 s. ISBN 0-13-555822-0.

[8] *Guinnessova encyklopédia.* Bratislava : Neografia, vydavateľstvo Mladé letá, 1992. 768 s. ISBN 80-06-00517-6.

[9] AZUD, J. *Medzinárodné právo.* Bratislava : Veda, vydavateľstvo Slovenskej akadémie vied 2003. 454 s. ISBN 80-224-0753-4.

Unpublished internal regulations, technical and annual reports:

[10] KOTVAN, P. *Výročná správa 2011.* Myjava, 2011. 56 s. Výročná správa. Slovplast Myjava, a.s.

[11] ČERNÁČEK, M. *Výročná správa 2010.* Myjava, 2010. 68 s. Výročná správa. Slovplast Myjava, a.s.

Standards:

[12] STN EN ISO 15874. *Plastové potrubné systémy na rozvod teplej a studenej vody.* Bratislava : Slovenský normalizačný ústav, 2011-11-20. 105 s. Triediaci znak 05 0618.

Internet resources:

[13] *Slovenská armatúrka Myjava* [online]. 2006-2011 [cit. 2011-10-23]. Dostupné z WWW: <http://slovenska_armaturka_myjava_a_s.sk-firma.com/>.

[14] *Montážny predpis* [online]. 2006-2011 [cit. 2011-10-23]. Dostupné z WWW: <http://www.slovplast-myjava.sk/index.php?lang=sk&menuid=815>.

[15] *Správa o stave podnikateľského prostredia* [online]. 2011 [cit. 2011-12-21]. Dostupné z WWW: <http://www.google.sk/#hl=sk&cp=49&gs_id=6&xhr=t&q=Tab.%3A+Index+glob%C3%A1lnej+konkurencieschopnosti+%28GCI%29&pf=p&sclient=psy-ab&site=&source=hp&pbx=1&oq=Tab.:+Index+glob%C3%A1lnej+konkurencieschopnosti+%28GCI%29&aq=f&aqi=&aql=&gs_sm=&gs_upl=&bav=on.2,or.r_gc.r_pw.,cf.osb&fp=3b4fb1c5e42f2a8e&biw=1366&bih=575>.

[16] *Analýza teritoriálnej a tovarovej štruktúry Slovenského exportu a importu* [online]. 2011 [cit. 2011-12-21]. Dostupné z WWW: <http://www.mzv.sk/App/wcm/media.nsf/vw_ByID/ID_DFC8562D804EBE2FC12577BB0032EE79_SK/$File/101013_Informacia_o_priebeznom_plneni_proexportnej_politiky_SR_na_roky_2007_2013_pr%C3%ADloha_september_2010.pdf>.

[17] *Definitívne údaje zahraničného obchodu za rok 2011* [online]. 2011 [cit. 2011-12-25]. Dostupné z WWW: <http://portal.statistics.sk/showdoc.do?docid=40213>.

[18] *História a súčasnosť* [online]. 2006-2011 [cit. 2011-10-23]. Dostupné z WWW: <http://slovarm.sk/index.php?str=profil&detail=1>.

[19] *Zahraničný obchod Slovenskej republiky* [online]. 2011 [cit. 2011-12-26]. Dostupné z WWW: <http://portal.statistics.sk/showdoc.do?docid=5727>.

[20] *Zhodnotenie hospodárskeho vývoja* [online]. 2011 [cit. 2011-12-11]. Dostupné z WWW:<http://www.alianciapas.sk/menu_pravidelne_globalna_konkurencieschopnost_2011.htm>

[21] *Celkový vývoz podľa tried harmonizovaného systému* [online]. 2011 [cit. 2011-12-18]. Dostupné z WWW: <http://www.sario.sk/userfiles/file/sario/zo/vyvoj/zo_sr_za_rok_2008.pdf>.

[22] *Exportný plán teritória* [online]. 2011 [cit. 2011-12-19]. Dostupné z WWW: <http://www.mzv.sk/App/wcm/media.nsf/vw_ByID/ID_6932CCEA263F0C72C125783B00449168_SK/$File/Rusko_EPT_2011.pdf>.

List of abbreviations

OJSC – Joint – stock company

Bc. – bachelor

No. – number

DIČ – tax identification number

g – Gram

h – Average

IČO, DIČ – identification number of company, value added tax

Ing. – Engineer

Kg – kilogram

mm – millimetre

min. – Minimum

Mgr. – Master

mil. – million

e. g. – for example

N. – order number

no. – Number

°C – degree Celsius

Ø – Diameter (in millimetres)

P – Page

S PN – pressure pipes Board

sec. – second

tab. – table

Denied. – Eventually

Ltd. – Loving Twix Disorder

i.e. – That is,

SKK – Slovak crown

WC – toilet

% – Percent indicator

€ – Euro

$ – dollar

- – decrease

+ – growth

List of tables and graphs

List of Appendices

Supplement no. 1: Chemical resistance of materials PP-R

Chemická odolnosť PP

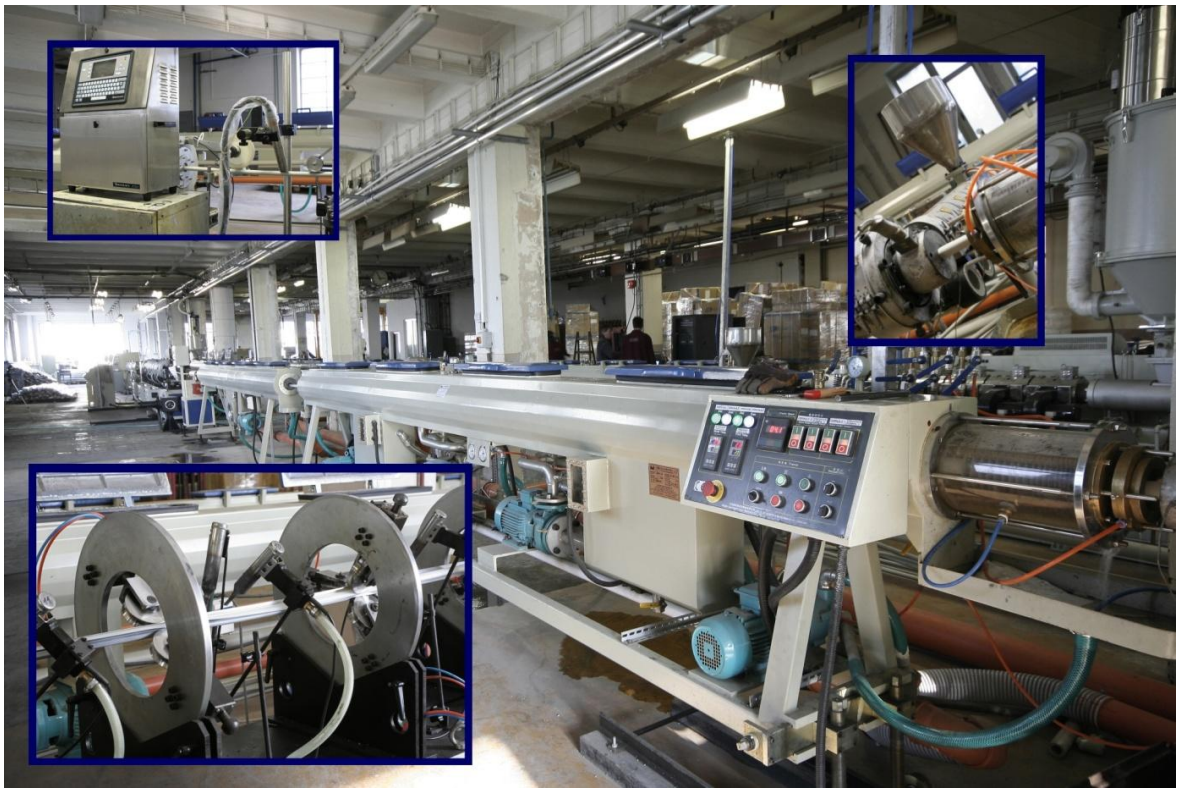
ČINIDLO	KONC. (%)	PP 20°C	PP 60°C	ČINIDLO	KONC. (%)	PP 20°C	PP 60°C
Acetón	100	1	1*	Kyselina benzoová	každá	1	1
Amoniak	každá	1	1	Kyselina dusičná	25	1	2
Amoniak plynný	100	1	1	Kyselina dusičná	50	2	3
Amoniak kvapalný	100	1	-	Kyselina fosforečná	50	1	1
Amylacetát	100	2	3	Kyselina fosforečná	80-95	1	1 ZF
Amylalkohol	100	1	1	Kyselina chlorovodíková	každá	1 ZF	1 ZF
Anilín	100	1	1	Kyselina octová (ľadová)	100	1	2 ZF
Benzén	100	2	3	Kyselina octová, ocot	10	1	1
Benzín normál	100	2	3	Kyselina sírová	5	1	1
Benzylalkohol	100	1	2	Kyselina sírová	98	2	3
Bróm kvapalný	100	3	-	Kyselina uhličitá	každá	1	1
Butylacetát	100	2	3	Kyseliny aromatické	100	1	1
Cyklohexán	100	1	-	Kysličník uhličitý,	100	1	1
Cyklohexanol	100	1	1	Ľanový olej	-	1	1
Cyklohexanón	100	1	2	Lúčavka kráľovská	-	2-3	3
Dietyéter	100	2	-	Manganistan draselný	nasýt.	1	1
Dichlórbenzén	100	2	3	Mazací olej	-	1	-
Dimetylformamid	100	1	1	Metanol	100	1	1*
Dusičnan amónny, v.r.	každá	1	1	Močovina, v.r.	až 33	1	1
Dusičnan sodný	nasýt.	1	1	Motorová nafta	100	1	2
Dusitan sodný v.r.	každá	1	-	Motorový olej (HD)	-	2	2
Etanol	96	1	1	Naftalén (kryštalický)	100	1	-
Etylbenzén	100	2	3	Ortuť	100	1	1
Etylén	100	-	-	Peroxid vodíka	10	1	1
Fenol	-	-	-	Peroxid vodíka	30	1	2
Formaldehyd, v.r.	až 40	1	1	Petrolej	-	1	2
Fosforečnan sodný	nasýt.	1	1	Pitná voda aj chlórovaná	100	1	1
Fosforečnany	každá	1	1	Propylénglykol	100	1	1
Glycerín v.r.	každá	1	1	Ropa	-	2	-
Glykol	100	1	1	Síra	každá	1	1
Hnojacie soli, v.r.	každá	1	1	Sírany	každá	1	1
Hydroxid draselný, v.r.	50	1	1	Sírouhlík	100	1-2	-
Hydroxid sodný, v.r.	každá	1	1	Sírovodík, plynný	100	1	1
Hydroxid vápenatý, v.r.	každá	1	1	Sírovodík, v.r.	nasýt.	1	1
Chlór, kvapalný	100	2	-	Sóda bikarbóna	nasýt.	1	1
Chlór,plynný, suchý	100	2	-	Strojový olej	-	1	2
Chlórbenzén	100	2	3	Tetrachlóretylén	100	2	3
Chlorid amónny	každá	1	1	Tiofén	100	1-2	2-3
Chlorid draselný	každá	1	1	Toulén	100	2	3
Chlorid železitý	nasýt.	1	1	Transformátorový olej	-	1	2
Chloroform	100	2	3	Trichlóretylén	100	2	2-3
Chlórová voda	nasýt.	2	3	Uhličitan sodný	každá	1	1
Izoktán	100	1	2	Vápenná voda	nasýt.	1	1
Izopropanol	100	1	1	Vazelína	-	1	2
Jódová tinktúra	obch.	1	-	Vykurovací olej	-	1	2
Krezol	100	1	2 ZF	Xylén	100	2	3

Informácie o uvedenej chemickej odolnosti, príp. s ďalšími chemickými činidlami poskytne výrobca suroviny na požiadanie.

Vysvetlivky: *1 - dobrá*-napučanie < alebo úbytok hmotnosti < 0.5%, predĺženie pri pretrhnutí prakticky nezmenené, *2 - stredná*-napučanie 3-8%, alebo úbytok hmotnosti 0,5 - 5%, zníženie predĺženia pri pretrhnutí < 50%, *3 - neodolný*-napučanie > 8%, alebo úbytok hmotnosti > 5%, zníženie predĺženia pri pretrhnutí > 50%, ZF-možná zmena farby, *-pri bode varu, v.r.-vodný roztok, nasýt.-nasýtený vodný roztok, obch.-bežná obchodná koncentrácia

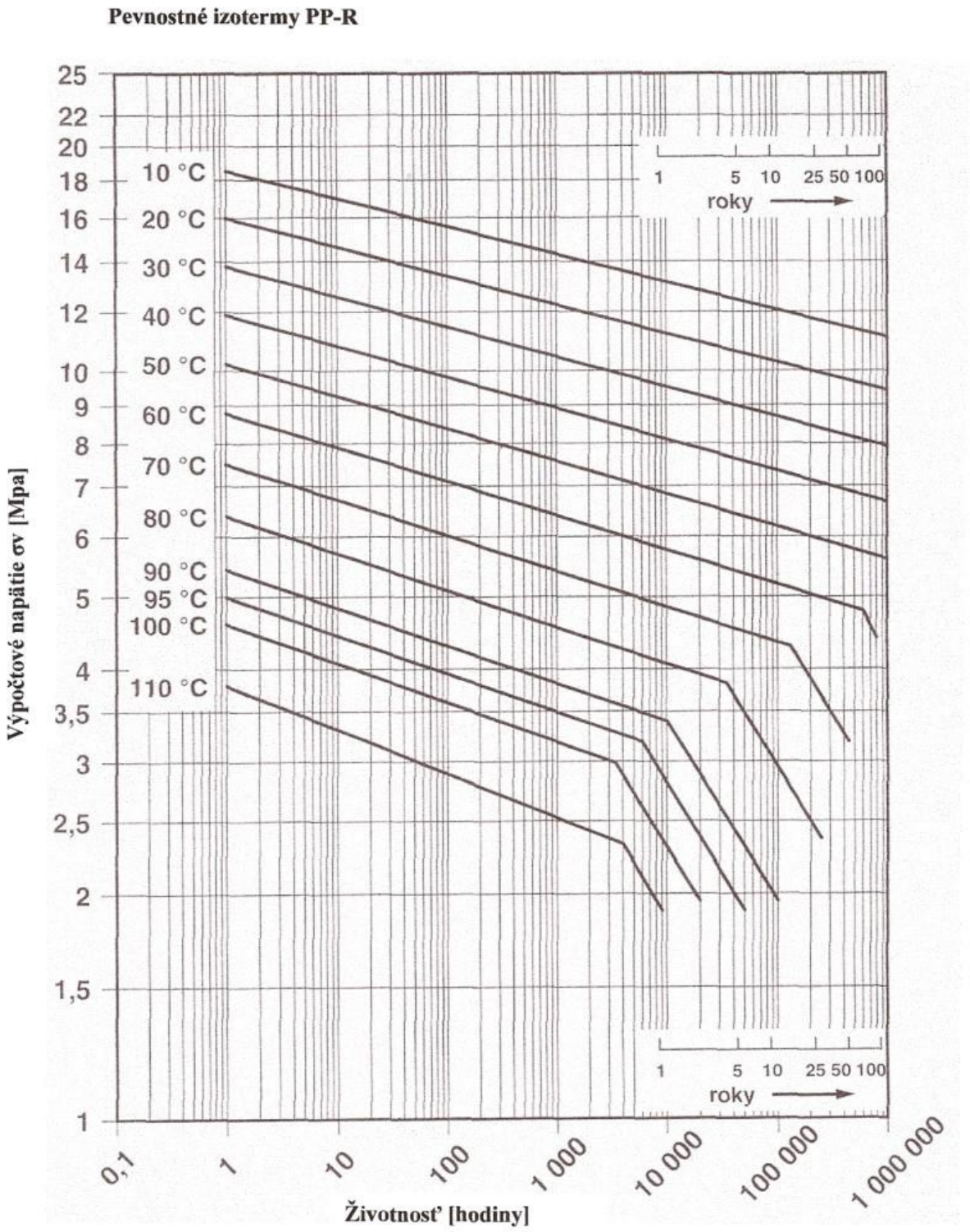
Supplement no. 1: Chemical resistance of materials PP-R
Source: [14]

Supplement no. 2: Tube Processing Technology – extrusion



Supplement no. 2: Tube Processing Technology - extrusion
Source: [14]

Supplement no. 3: Strength isotherm of PPR Pipe, Type 3



Supplement no. 3: Strength isotherm of PPR Pipe, Type 3
Source: [14]

Supplement no. 4: Operating parameters of PPR pipes

TEPLOTA	ŽIVOTNOSŤ	TLAKOVÁ RADA			
		S 5 (PN 10)	S 3,2 (PN 16)	S 2,5 (PN 20)	
(°C)	(ROKY)	Prístupný prevádzkový tlak (bar)			
10	5	16,6	26,4	33,2	Koeficient bezpečnosti 1,5
	10	16,1	25,5	32,1	
	25	15,6	24,7	31,1	
	50	15,2	24,0	30,3	
20	5	14,1	22,3	28,1	
	10	13,7	21,7	27,3	
	25	13,3	21,1	26,5	
	50	12,9	20,4	25,7	
30	5	12,0	19,0	23,9	
	10	11,6	18,3	23,1	
	25	11,2	17,7	22,3	
	50	10,9	17,3	21,8	
40	5	10,1	16,0	20,2	
	10	9,8	15,6	19,6	
	25	9,4	15,0	18,8	
	50	9,2	14,5	18,3	
50	5	8,5	13,5	17,0	
	10	8,2	13,1	16,5	
	25	8,0	12,6	15,9	
	50	7,7	12,2	15,4	
60	5	7,2	11,4	14,3	
	10	6,9	11,0	13,8	
	25	6,7	10,5	13,3	
	50	6,4	10,1	12,7	
70	5	6,0	9,5	11,9	
	10	5,9	9,3	11,7	
	25	5,1	8,0	10,1	
	50	4,3	6,7	8,5	
80	1	5,5	8,6	10,9	
	5	4,8	7,6	9,6	
	10	4,0	6,3	8,0	
	25	3,2	5,1	6,4	
95	1	3,9	6,1	7,7	
	5	2,5	4,0	5,0	

Supplement no. 4: Operating parameters of PP-R pipes
Source: [14]

Supplement no. 5: Hygiene Certificate (сертификация гигиена)

ФЕДЕРАЛЬНАЯ СЛУЖБА ПО НАДЗОРУ
В СФЕРЕ ЗАЩИТЫ ПРАВ ПОТРЕБИТЕЛЕЙ И БЛАГОПОЛУЧИЯ ЧЕЛОВЕКА
УПРАВЛЕНИЕ ФЕДЕРАЛЬНОЙ СЛУЖБЫ ПО НАДЗОРУ В СФЕРЕ ЗАЩИТЫ ПРАВ ПОТРЕБИТЕЛЕЙ И БЛАГОПОЛУЧИЯ ЧЕЛОВЕКА ПО ГОРОДУ МОСКВЕ

(наименование территориального органа)

САНИТАРНО-ЭПИДЕМИОЛОГИЧЕСКОЕ ЗАКЛЮЧЕНИЕ

№ 77.01.16.229.П.072996.09.08 от 01.09.2008

Настоящим санитарно-эпидемиологическим заключением удостоверяется, что продукция:
Изделия из полипропилена: фитинги, трубы, арт. "PP-R", "PP-R PN10", "PP-R PN16", "PP-R PN20", "STABI PP-R PN20".

изготовленная в соответствии
Декларация о соответствии.
Сертификат качества.

СООТВЕТСТВУЕТ (НЕ СООТВЕТСТВУЕТ) санитарным правилам
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Организация-изготовитель
"СЛОВПЛАСТ МИДЖАВА a.c." Словакия
("SLOVPLAST MYJAVA a.s.")
Адрес:Kpt. M. Uhra 57/3, 90701 Myjava,

Получатель санитарно-эпидемиологического заключения
"СЛОВПЛАСТ МИДЖАВА a.c." Словакия
("SLOVPLAST MYJAVA a.s.")
Адрес:Kpt. M. Uhra 57/3, 90701 Myjava,

Основанием для признания продукции, соответствующей (не соответствующей) санитарным правилам, являются (перечислить рассмотренные протоколы исследований, наименование учреждения, проводившего исследования, другие рассмотренные документы):
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№2246786

Supplement no. 5: Hygiene Certificate (сертификация гигиена)
Source: [14]

ГИГИЕНИЧЕСКАЯ ХАРАКТЕРИСТИКА ПРОДУКЦИИ

Вещества, показатели (факторы)	Гигиенический норматив (СанПиН, МДУ, ПДК и др.)
Запах балл	1
Токсичность %	70-120
Ацетальдегид мг/л	0,2
Ацетон мг/л	0,1
Этилацетат мг/л	0,2
Гексан мг/л	0,01
Гептан мг/л	0,005
Спирт метиловый мг/л	0,2
Спирт пропиловый мг/л	0,1
Спирт изопропиловый мг/л	0,1
Спирт бутиловый мг/л	0,5
Спирт изобутиловый мг/л	0,5

Область применения:
хозяйственно-питьевое водоснабжение

Необходимые условия использования, хранения, транспортировки и меры безопасности:
В соответствии с инструкцией производителя.

Информация, наносимая на этикетку:
Наименование товара, страна, фирма-производитель, назначение, основные свойства, правила пользования, выполненные на русском языке.

Заключение действительно до **01.09.2013 г.**

Главный государственный санитарный врач
(заместитель главного государственного санитарного врача) **ФИЛАТОВ Н. Н.**

Подпись

Формат А4. Бланк. Срок хранения 5 лет.

Supplement no. 6: The Treaty recognized the commitment and repayment of the debt in instalments

Zmluva o uznaní záväzku a zaplatení dlhu v splátkach

Uzatvorená podľa § 323 Obchodného zákonníka v platnom znení

Zmluvné strany:

Veriteľ: Slovplast Myjava, a.s.

Zastúpený Petrom Kotvanom, generálnym riaditeľom

So sídlom: ulica kapitána Miloša Uhra 57 / 3 Myjava, 907 01

IČO: 35769874

Bankové spojenie: VOLKSBANK a.s., č. účtu: 1002454203/3100

Dlžník: VneshTorgProm

Zatonnaya str. 7/3, 115407 Moskva, Ruská federácia

IČO: 7725607317

Zastúpený: Mária Ivanovna Zajcevová

I.

Predmet dohody

Touto zmluvou sa dlžník zaväzuje splácať veriteľovi dlh v splátkach vo výške 66.620,52 euro za stanovených podmienok.

II.

Uznanie dlhu

V súlade s ustanovením § 323 v znení neskorších predpisov obchodná spoločnosť VneshTorgProm, so sídlom Zatonnaya str. 7/3, 115407 Moskva, IČO: 7725607317, uznáva svoj záväzok zaplatiť firme Slovplast Myjava, a.s., ulica kapitána Miloša Uhra 57 / 3, Myjava, 907 01, IČO: 35769874, dlh vzniknutý na dodanom tovare v celkovej výške 66.620,52 eur (slovom šesťdesiatšesťtisícšesťstodvadsať eur päťdesiatdva centov.

Uvedenú zmluvu sa zaväzuje uhradiť v súlade s touto zmluvou na základe splátkového kalendára dohodnutého v tejto zmluve na rok 2012.

Supplement n. 6: The Treaty recognized the commitment and repayment of the debt in Instalments
Source: [14]; own design

III.

Výška a podmienky splácania dlhu

Veriteľ a dlžník sa dohodli, že dlžník uhradí:

Stanovenú sumu vždy k prvému dňu dohodnutého termínu. Dlh uhradí podľa čísla II. Tejto zmluvy a uhradí v piatich splátkach nasledovne:

1. splátka vo výške 8.150, eur do 31.5. 2012
2. splátka vo výške 12.318, eur do 30.6. 2012
3. splátka vo výške 13.785, eur do 31.7. 2012
4. splátka vo výške 15.014, eur do 31.8. 2012
5. splátka vo výške 17,351, eur do 30.9. 2012.

Dlžník sa zaväzuje uhrádzať splátky podľa tejto zmluvy bankovým prevodom na účet veriteľa uvedený v záhlaví tejto zmluvy.

IV.

Osobitné ustanovenia

Zmluvné strany sa dohodli, že pri nesplnení niektorej splátky nastáva porušenie zmluvy. Pri porušení zmluvy nastáva právo rozmiestniť splátkový kalendár na menšie čiastky a na dlhšie časové obdobie po dobu roka 2012 a 2013.

V.

Záverečné ustanovenia

1. Zmluva nadobúda platnosť podpisom obidvoch strán.
2. Zmluvné strany vyhlasujú, že sa s obsahom tejto zmluvy oboznámili a porozumeli jej obsahu a že zmluvu uzatvorili slobodne a bez omylu.
3. Táto zmluva je vyhotovená v 2 rovnopisoch, z ktorých jedno vyhotovenie obdrží veriteľ a jedno vyhotovenie dlžník.

V Myjave dňa:

.....

firma Slovplast Myjava, a.s.
Peter Kotvan, veriteľ

.....

dlžník
firma VneshTorgProm