



**Naval Surface Warfare Center (NAVSEA) Crane
Division**
Non-Invasive Measurement System
(US Patent No. 7,278,310)
Mini Market Study Report
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Sponsored by:



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MARKET STUDY REPORT

Technology Synopsis

This invention is a Non-Invasive Measurement System it is used in a manufacturing process for a manufacturing company to produce explosives. The measurement system consists of an electrical strip placed on the outside of the tube that will give a reading of the level of material that remains after usage of the manufacturing process. The piston has a magnet attached to its backside that gives off signals to the electrical strip to let the strip know its location at all times. The purpose of its creation was because manufactures employees couldn't tell how much material was left in the tube after being used. With this technology the employees now can get an LCD reading to aware an employee of the certain level of material that are left behind after being used in the manufacturing process.

This technology would be a great application for any company that has tanks or stainless steel vessels that hold high or low viscosity material. Our technology would be beneficial to companies that are producing explosives material or any kind of liquid material and trying to work with a lean manufacturing mentality.

Potential Applications

Industry	Industry Segments	Application Segments
A. Military	1. Explosives	1. Metal Tubes
B. Commercial	1. Pyrotechnics & Explosives 2. Fuel 3. Oil	1. Metal Tubes 2. 500- 20,000 above ground gallon fuel tanks 3. 500- 20,000 above ground gallon oil tanks

At this time the biggest area for potential applications are within the military and commercially in the manufacturing processing field. The navy is currently using this technology in some applications and it has been successful for the need required. The next steps would be to implement this technology in other military branches that produce explosive material in a manufacturing process or for other usage to keep track of material. Also, companies that produce products like the non-invasive measurement system could implement this technology into their line of products to increase their customer satisfaction.

Competing Technologies

Company Name	Product Name	Comment
Ningbo Cixi Imp. & Exp. Corp.	Eastern Long Oil Tape	It measures about 164ft, but you have to manually use the tape to measure the fluid.
Northeast Controls Inc.	Model 900B Impeller-Type Flow Meter	Limited on measuring pressure and viscosity. Causes a pinch point that can cause damage to equipment and humans.
Austin Powder Co	Model 900B Impeller-Type Flow Meter	Limited on measuring pressure and viscosity. Causes a pinch point that can cause damage to equipment and humans.
Orica	Model 900B Impeller-Type Flow Meter	Limited on measuring pressure and viscosity. Causes a pinch point that can cause damage to equipment and humans.

Competitive Advantage

The current manufacturing process called impeller type flow meter in a piston-cylinder extruder has many limitations. First, they can only measure low pressure and low viscosity which makes the company limited on what they can produce. Second, with this impeller type flow meter sensor not only does it reduce the maximum flow rate, but also creates a “pinch point”. The pinch point is caused by flow meter’s moving impeller and that can cause the explosives they are trying to produce to ignite and cause serious damage. With our product the non-invasive measurement system we can measure at a higher pressure and higher amount of viscosity compared to the current products on the market. The non-invasive measurement system doesn’t cause any pinch point and that is an important aspect of this technology because we are trying to save lives and equipment.

Market Size

The U.S. explosives and pyrotechnics market grows at an annual rate of 4.5%.¹ The explosives market is projected to reach 12.9 million metric tons by 2015, according to New Report by Global Industry Analysts, Inc. The US, Europe and Asia collectively account for about 85 percent of the global explosives market.² The industry's revenue for the year 2010 was approximately \$2.3 billion USD.³ According to the International Trade Centre, in 2005 the United States imported \$494,477,000 worth of explosives and pyrotechnic products, or 24% of the world’s total.⁴ The mining industry uses about 87% of all the explosives used in the U.S. on an annual basis, explosives are used in virtually every segment of the manufacturing and major construction industries. The market for the Non-Invasive Measurement System is a large market and is continually growing with new technology that’s being implemented each year. Flow Research has released a new study that shows the global flowmeter market is projected to grow substantially to exceed US \$5.5 billion by 2014, with the most rapid growth taking place in China, the Middle East, and in developing Asian countries.⁵ It is predicted that by 2013, the global flow meter market will reach 3.48 billion U.S. dollars. In the industrial field, measuring instrument referred to as fluid flow meter or flow table. Flow meter for industrial measurement is one of the most important instruments.² With industrial development, on the flow measurement accuracy and range of increasingly high demand, in order to adapt to multiple uses, various types of flow one after another, widely used in oil and gas, petrochemical, water treatment, food and beverage, pharmaceutical, energy, metallurgy, pulp and paper and construction materials industries.⁶ In 2008 the market size of global flow reached 2.83 billion U.S. dollars, representing an increase of approximately 3.9% in 2007. It is predicted that by 2013, the global flow meter market will reach 3.48 billion U.S. dollars. 2008 to 2013 the average annual compound growth rate will reach 4.2%.²

¹ <http://www.allbusiness.com/specialty-businesses/639757-1.html>

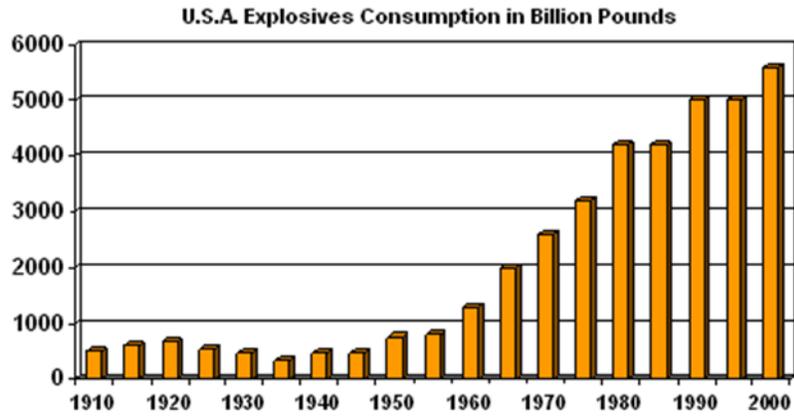
² <http://www.prweb.com/releases/explosives/anfo/prweb860324.htm>

³ <http://finance.yahoo.com/news/Research-and-Markets-A-2011-bw-2605307715.html?x=0&.v=1>

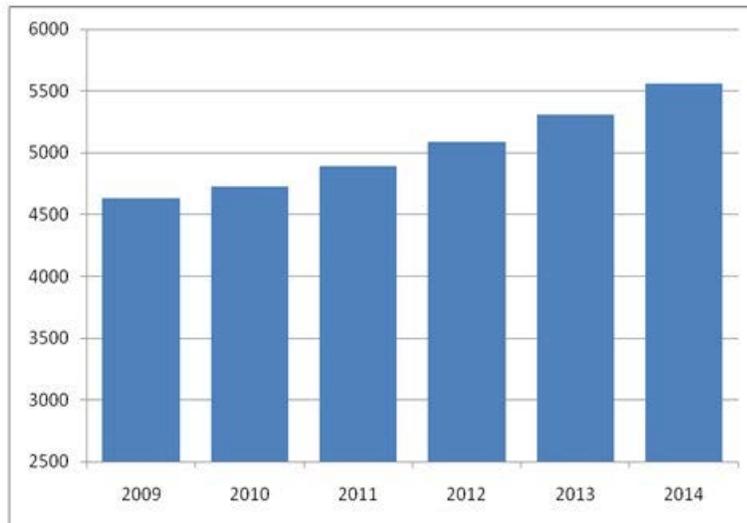
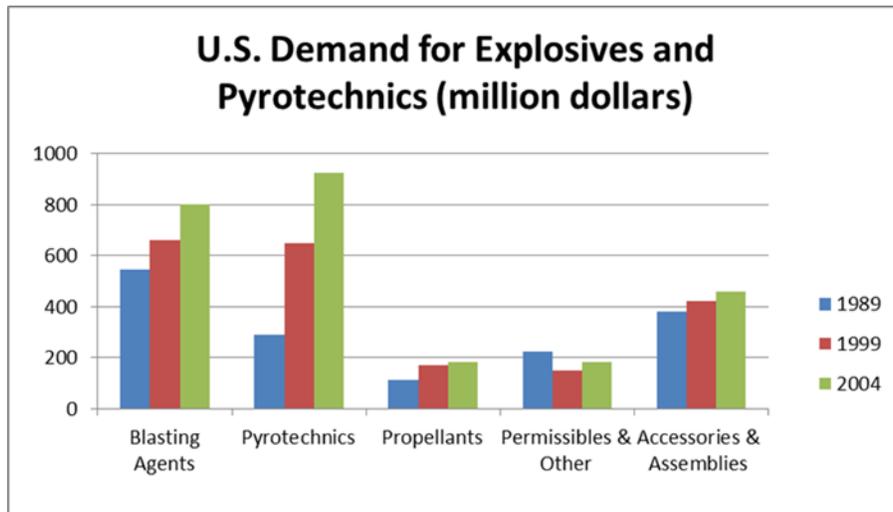
⁴ <http://rankingamerica.wordpress.com/2009/02/>

⁵ <http://www.epmag.com/2011/January/item75194.php>

⁶ http://www.wostom.cn/news/news17_en.html



Growth in US explosives consumption leads to the need for safer forms of protection



This graph shows the Total Shipments of All Flowmeters Worldwide (Millions of Dollars) for the years 2009 through 2014⁷

Potential targets for licensing

The companies that would probably license this technology would be companies that provide the United States Government with explosives that include: missiles, bombs, and etc. Also, another market we are targeting will be manufacturing processes for companies with specialize instrumentals and special flow meters. Most of the big name companies that were listed were difficult to get answers and information for the market study so smaller companies were targeted to get more feedback. After market research most manufacturing companies already have established long relations with companies and are hesitant to start new relationships with new upcoming companies. Once contacting companies that specialize in the Pyrotechnics & Explosives most of the big name companies had a bureaucracy system that made the process longer to get the required feedback. Once contacting smaller Pyrotechnics & Explosives companies they were willing to get better feedback and help breakdown the manufacturing process for their products. With the companies for the flow meter some were interested and some weren't the companies that were targeted: SRB Controls Inc., Eldridge Products Inc., King Instrument Company, Flexim Americas Corp, and Morrison Bros. All these companies specialize in flow meter for industrial manufacturing processes and would be a great start to find potential licensing agreements.

Keys to Commercialization

The keys to commercialization for this technology would begin with its market opportunity. The U.S. explosives and pyrotechnics market grows at an annual rate of 4.5%.⁸ The explosives market is projected to reach 12.9 million metric tons by 2015, according to New Report by Global Industry Analysts, Inc.⁹ In fiscal year 2010; the Department of Defense has a base budget of \$533.8 billion.¹⁰ This Study proves that this market is growing and will continue to grow because The United States has the largest defense budget in the world. Flow Research has released a new study that shows the global flowmeter market is projected to grow substantially to exceed US \$5.5 billion by 2014, with the most rapid growth taking place in China, the Middle East, and in developing Asian countries.¹¹ With this information it proves that even with a recession in the United States this market is still growing and looking very prosperous. The first key to success would be to focus on licensing with Pyrotechnics & Explosives companies: Austin Powder Co. and Orica. Next, step would begin discussions with Austin Powder Co. & Orica pertaining to a licensing agreement with their explosive division. Also, focus on manufacturing companies that produce tanks and steel vessels for possible partnerships.

Appendices

⁸ <http://www.allbusiness.com/specialty-businesses/639757-1.html>

⁹ <http://www.prweb.com/releases/explosives/anfo/prweb860324.htm>

¹⁰ http://en.wikipedia.org/wiki/United_States_Armed_Forces

¹¹ <http://www.epmag.com/2011/January/item75194.php>

