CASING & CEMENTATION HARDWARE
BY APPLICATION (ONSHORE & OFFSHORE), BY TYPE
(LINER EQUIPMENT, CENTRALIZERS, FLOAT EQUIPMENT,
WIPER PLUGS, AND OTHERS) & REGION
GLOBAL FORECASTS TILL 2019
MarketsandMarkets is a global market research and consulting company based in the U.S. We publish strategically analyzed market research reports and serve as a business intelligence partner to Fortune 500 companies across the world. MarketsandMarkets also provides multi-client reports, company profiles, databases, and custom research services.

MarketsandMarkets covers fourteen industry verticals, including aerospace and defence, advanced materials, automotives and transportation, biotechnology, chemicals, consumer goods, energy and power, food and beverages, industrial automation, medical devices, pharmaceuticals, semiconductor and electronics, and telecommunications and IT.
1 INTRODUCTION

1.1 OBJECTIVES OF THE STUDY

- To define the key global markets for the casing & cementation hardware market
- To analyze the casing & cementation hardware market with respect to different technology and application, and trends and forecasts of the casing & cementation hardware market and its sub-segments
- To strategically analyze micro-markets with respect to individual growth trends, future prospects, and contribution to the total market
- To analyze major driving factors, restraints, opportunities, burning issues, and winning imperatives in the casing & cementation hardware market
- To identify and analyze high-growth segments, sub-segments, and regions presenting growth opportunities for the stakeholders
- To analyze the industrial trends in major regions, namely North America, Asia-Pacific, Europe, Latin America, Africa, and the Middle East
- To track and analyze competitive developments, such as joint ventures and mergers & acquisitions in the global casing & cementation hardware market

1.2 MARKET DEFINITION

The casing and cementation hardware are the equipment that are used to carry out services such as casing and cementation during the well completion process. These are the equipment that are used to perform the function of casing and cementation. These equipment are purchased by the service providers and used at well sites for carrying out casing and cementing operations.

In this report, the market segments are defined as below:

1.2.1 FLOAT

Float collars and shoes allow operators to maintain a constant fluid height inside the casing of a well. As fluid is allowed to enter through the bottom of the casing, the system maintains a constant differential pressure between the inside and outside of the casing at floats, to ensure constant fluid height within the casing.

1.2.2 WIPER PLUGS

They are designed to provide fluid separation during displacement and efficiency for wiping wellbore casing and tubular of drilling mud, spacers, and cement. They provide protection from over displacement and acts as an indicator when displacement is complete.

1.2.3 CENTRALIZERS

It is a mechanical device that keeps casing away from the wellbore wall. There are two types of centralizers, bow-spring design and rigid blade design. Bow-spring centralizers help center casing in a wellbore, that helps in even distribution of cement around the casing and increases fluid turbulence at the tool, helping remove filter cake from a wellbore.
1.2.4 LINER EQUIPMENT
Liner is a casing string that does not extend back to the well head, but is hung from another casing string. They are used to reduce cost, improve hydraulic performance when drilling deeper, and allow the use of large tubing above the liner top.

1.3 STUDY SCOPE

1.3.1 MARKETS COVERED

By Equipment
The key casing & cementation hardware markets covered include:

- **By Hardware Type:** Casing equipment and cementation equipment
- **By Equipment:** Float, wiper plugs, centralizers, liners and others (stage tools, casing packers)
- **By Application:** Onshore and offshore

By Region
- **By Geography:** North America, Asia-Pacific, Europe, Latin America, Africa, and the Middle East

1.3.2 YEARS CONSIDERED FOR THE STUDY

- **Historical Year** - 2012
- **Base Year** - 2013
- **Estimated Year** - 2014
- **Projected Year** - 2019

Base year used for company profiles was 2013. Where the information could not be available for the base year, the prior year has been considered
2 RESEARCH METHODOLOGY

This research study involved the usage of extensive secondary sources, directories, and databases such as Hoovers, Bloomberg, BusinessWeek, Factiva, and OneSource, to identify and collect information useful for this technical, market-oriented, and commercial study of the global casing & cementation hardware market. The primary sources are primarily several industry experts from core and related industries and preferred suppliers, manufacturers, distributors, service providers, reimbursement providers, technology developers, standards and certification organizations from companies, and organizations related to all segments of this industry’s value chain. In-depth interviews have been conducted of various primary respondents that include key industry participants, Subject Matter Experts (SMEs), C-level executives of key market players, and industry consultants, among other experts to obtain and verify qualitative and quantitative information as well as assess future prospects. The following figure shows the market research methodology applied in making this report on the global casing & cementation hardware market.

**FIGURE 1 CASING & CEMENTATION HARDWARE MARKET: RESEARCH DESIGN**

Source: Secondary Literature and MarketsandMarkets Analysis
3 PREMIUM INSIGHTS

3.1 ATTRACTIVE OPPORTUNITIES IN THE GLOBAL CASING & CEMENTATION HARDWARE MARKET

**FIGURE 2** INCREASING E&P ACTIVITIES DRIVING THE CASING & CEMENTATION HARDWARE MARKET

<table>
<thead>
<tr>
<th>CAGR XX%</th>
<th></th>
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<tbody>
<tr>
<td>XX</td>
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</table>

**ATTRACTIVE MARKET OPPORTUNITIES**

- The global casing & cementation hardware market is estimated to reach a value of XX billion in 2014, at a CAGR of XX% from 2014 to 2019.
- Market growth is attributed to continuous increase in drilling activities globally and shale boom in the U.S.
- Emerging economies such as India and China offer several attractive opportunities such as unconventional reserves.

*Source: SEC Filings, Investor Presentations, Expert Interviews, and MarketsandMarkets Analysis*
3.2 CASING & CEMENTATION HARDWARE MARKET, BY APPLICATION

**FIGURE 3** OFFSHORE APPLICATION IS EXPECTED TO GROW AT A HIGHER RATE IN THE CASING & CEMENTATION HARDWARE MARKET

Source: SEC Filings, Investor Presentations, Expert Interviews, and MarketsandMarkets Analysis
3.3 CASING & CEMENTATION HARDWARE MARKET IS EQUALLY DISPERSED, GLOBALLY

**FIGURE 4** NORTH AMERICA WILL BE THE FASTEST GROWING MARKET FROM (2014-2019)

Source: SEC Filings, Investor Presentations, Expert Interviews, and MarketsandMarkets Analysis
4 MARKET OVERVIEW

4.1 INTRODUCTION

Well completion is done in all producing wells after they have been drilled through rock formations. These raw sides of the well, however, cannot support themselves, hence a tube is set inside the drilled well to protect and support the wellstream. This tube is known as casing. Casing protects a wellstream from outside contaminants as well as any fresh water reservoirs from oil or gas that is being produced. Problems in casing and cementing could be threats to well integrity.

**FIGURE 5** THREATS TO WELL INTEGRITY

Drilling of an oil & gas well is a multistage process; the upper parts of a borehole are sealed with steel casing and then cemented. Cementing is done by pumping water-cement slurries down the casing. The integrity of these seals is pressure tested before the next stage of drilling begins. In case of improper casing or cementing, the above listed problems may occur in the well, posing a threat to the safety of the wellsite.
5  CASING & CEMENTATION HARDWARE, BY TYPE

5.1  FLOAT EQUIPMENT

The different types of float equipment include guide shoe, float shoe, float collars, insert flapper valve and differential fill up & automatic fill up float collars, and float shoes. It is commonly used on the lower section of a well casing. The float equipment aids in preventing backflow of cement after full displacement. It also reduces strain on the derrick while placing the casing in a wellbore.

Guide shoes: They are attached to the lowest-end of the casing string to allow the passing of ledges or obstructions in a wellbore. It protects the casing string from the impact associated with landing casing on bottom, aids the casing pass through narrow and deviated holes, and areas with hard shoulders. It provides a re-entry angle to help ensure bits and other bottom-hole assembly hardware to enter the casing during tripping operations.

Float shoe: It has a rounded profile with an integral check valve attached to the bottom of a casing string. It aids in preventing reverse flow, U-tubing of cement slurry from the annulus into the casing or flow of wellbore fluids into the casing string while it is run.

Float collars: These are placed near the bottom of the casing string. The check valve assembly fixed within the float collar prevents flow back of the cement slurry when pumping is stopped.

Insert flapper valves: These are installed in the casing string above the guide shoe. It is used for shallow wells for pressures less than the collapse pressure. It also provides space for isolating contaminated cement.

Differential fill up & automatic fill up float collars and float shoes: They permit a controlled amount of fluid to enter the bottom of a casing while it is being run in the hole.

### TABLE 1  FLOAT EQUIPMENT MARKET SIZE, BY REGION, 2012-2019 ($MILLION)

<table>
<thead>
<tr>
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<tbody>
<tr>
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<td>XX</td>
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<td>South &amp; Central America</td>
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<tr>
<td>Africa</td>
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<td>Total</td>
<td>XX</td>
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</tbody>
</table>

* e - estimated; p - projected

Source: Annual Reports, Press Release, Investor Presentation, and MarketsandMarkets Analysis

North America is estimated to become the largest market during the forecast period for the float equipment, because of the extensive hydraulic fracturing going on in the region. On the other hand, South America and Africa, with new E&P activities, are attractive markets for float equipment manufacturers. The market for float equipment in North America was estimated to reach a value of XX million in 2014, and is projected to reach a value of XX million by 2019.
6.1 INTRODUCTION

6.1.1 ONSHORE

FIGURE 6 NORTH AMERICA IS EXPECTED TO BE THE FASTEST GROWING MARKET FROM 2014 TO 2019 DUE TO INCREASE IN ONSHORE DRILLING ACTIVITIES

Source: SPE Papers, Related Research Reports, Company Annual Reports, Expert Interviews, and MarketsandMarkets Analysis
## TABLE 2
ONSHORE CASING & CEMENTATION HARDWARE MARKET SIZE, BY REGION, 2012-2019 ($MILLION)

<table>
<thead>
<tr>
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<tbody>
<tr>
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<td>South &amp;Central America</td>
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<tr>
<td>Europe</td>
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<td>Asia-Pacific</td>
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<tr>
<td>Middle East</td>
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<tr>
<td>Africa</td>
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<tr>
<td>Total</td>
<td>XX</td>
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</tbody>
</table>

e – Estimated; p – Projected

Source: Expert Interviews and MarketsandMarkets Analysis

North America accounted for the largest market share of XX% in 2013 due to old and ongoing onshore drilling activities. The shale boom in the U.S. is also one of the drivers of this market. The North American market is estimated to be XX million in 2014, and is projected to reach a value of XX million by 2019 at the highest CAGR of XX% during the forecast period. Europe is projected to grow at a CAGR of XX% from 2014 to 2019 due to new licenses issued by governments to overcome loss in production levels in 2013. Moreover, the potential for offshore oil & gas production has been assessed to be more than the current production. The Asia-Pacific market had a decent share of XX% in 2013, within the onshore casing & cementation hardware market, and is expected to maintain a healthy CAGR of XX% during the forecast period.
7 CASING & CEMENTATION EQUIPMENT MARKET, BY REGION

7.1 NORTH AMERICA

North America as an important segment of Global Casing & Cementation hardware market

- XX% of global casing & cementation hardware market
- Expected to grow at a CAGR of XX% (2013 – 2018)
- U.S. commands ~XX% share of North American market
- U.S. is the fastest growing country in the global casing & cementation hardware market
- ~XX% casing & cementation hardware revenue of the top XX market players comes from the North America region

Growing energy demands globally has led to increased exploration & production activities, resulting in more drilling activities. North America accounts for almost half of the world’s drilling & exploration activities. New discoveries in the offshore regions and shale gas exploration are the major factors driving the casing and cementation hardware market in North America.

The U.S., which is the largest market in North America, is one of the largest oil producers and the largest oil importer in the world, as domestic oil production does not fulfill high energy demands from different sectors. After a slow drilling pace in 2013, drilling activities have rebound this year in both the U.S. and Canada, assisted by drilling efficiencies. Hence, the U.S. and Canada are lucrative markets for casing & cementation hardware providers as the region is witnessing increased spending in the oil & gas sector.
**TABLE 3**

NORTH AMERICA: CASING & CEMENTATION HARDWARE MARKET SIZE, BY COUNTRY, 2012-2019 ($MILLION)

<table>
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<tr>
<td>Canada</td>
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<tr>
<td>Total</td>
<td>XX</td>
<td>XX</td>
<td>XX</td>
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</tbody>
</table>

*Source: Annual Reports, Press Release, Investor Presentation, and MarketsandMarkets Analysis*

The total North American casing & cementation hardware market was valued at XX million in 2013, and is projected to reach XX by 2019. The U.S. is the dominant market in the North American region, expected to account for more than XX% share in 2014. Canada is growing at a rapid pace, and is estimated to register a CAGR of XX% from 2014 to 2019, to reach a value of XX million by 2019.

### 7.1.1 U.S.

Over the past five years, horizontal rigs deployed in the U.S. have almost quadrupled, from XX in early 2009 to more than XX as of today. Almost all recent gains in the U.S. oil production are a result of horizontal drilling techniques being used across much of the Midwest, from Texas to North Dakota. Unlike conventional vertical wells, where more wells do not always equal more oil, drilling as many as possible to unlock oil trapped in rock formations appears to be the strategy in a shale field.

Major companies in the oil & gas sector are also investing heavily in E&P activities in the region. Chevron Corp. invested XX billion for E&P activities in 2014. Of the total, XX billion will be spent in the U.S. ConocoPhillips announced a capital expenditure budget of XX billion for 2014; about XX% of the budget has been allocated for North America. The U.S. is the largest market for casing & cementation hardware, and this trend is expected to continue due to sustained investments in E&P activities and increased hydraulic fracturing in the region.

**TABLE 4**


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<tbody>
<tr>
<td>Onshore</td>
<td>XX</td>
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<tr>
<td>Offshore</td>
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<tr>
<td>Total</td>
<td>XX</td>
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</tbody>
</table>

*Source: Annual Reports, Press Release, Investor Presentation, and MarketsandMarkets Analysis*

The major chunk of casing & cementation equipment revenue in the U.S. comes from onshore activities due to extensive hydraulic fracturing and horizontal drillings being carried out in the region. The onshore market is estimated to reach a value of XX million in 2014. The offshore market is estimated to grow at a higher CAGR of XX% from 2014 to 2019, and is projected to reach a value of XX million by 2019.
7.1.2 CANADA

Canada’s drilling fleet is always changing to incorporate new technologies and meet market demands. Most noticeably, the Canadian drilling fleet is growing in numbers. The fleet has XX% more rigs than it did XX years ago. Today, the rig fleet offers a little more than XX rigs. Western Canada has plenty of both gas and oil, and extraction activity cycles back and forth between extraction of oil or gas. The Canadian market for casing & cementation hardware is growing at a tremendous rate, which makes it an attractive market for service providers. Increased E&P revenues and drilling of more wells in the region are indicators that Canada is likely to become a lucrative market in the future for casing & cementation hardware.

**TABLE 5** CANADA: CASING & CEMENTATION HARDWARE MARKET SIZE, BY APPLICATION, 2012-2019, ($MILLION)

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<tbody>
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<td>Onshore</td>
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</tr>
<tr>
<td>Offshore</td>
<td>xx</td>
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<td>xx</td>
<td>xx</td>
<td>xx</td>
</tr>
<tr>
<td>Total</td>
<td>xx</td>
<td>xx</td>
<td>xx</td>
<td>xx</td>
<td>xx</td>
</tr>
</tbody>
</table>

_e-estimated; p-projected_

*Source: Annual Reports, Press Release, Investor Presentation, and MarketsandMarkets Analysis*

The Canadian casing & cementation hardware market is growing at a rapid pace. The onshore market is estimated to reach a value of XX million in 2014, at a CAGR of XX% from 2014 to 2019. It is projected to reach a value XX million by 2019.
8 COMPANY PROFILES

8.1 FORUM ENERGY TECHNOLOGIES INC.

8.1.1 BUSINESS OVERVIEW

Forum Energy Technologies Inc. is an oilfield products & service company, catering to different sub-sectors within the oil & natural gas industry such as subsea, drilling, completion, production, and the process industry. Forum Energy Technologies Inc. provides casing and cementing solutions under its drilling and subsea segment, sub-segmented to downhole technologies and further trickling down to cementing equipment and casing accessories product line. The drilling and subsea segment provides products and services related to subsea construction, drilling, well construction & completion, and well intervention.

The company provides downhole protection services through a fully-owned subsidiary, Davis-Lynch, LLC, acquired by Forum Energy Technologies in 2011 and based at Pearland, Texas. Davis Lynch offers a wide product range in completion & cementing such as a range of centralizers and primary cementing aids, multi-purpose float collars, stage cementing tools, inner-string cementing tools, inflatable packers, flotation collars, cementing plugs, fill and circulate tools, casing hangers and drive pipe landing rings, as well as surge reduction equipment.

The major competitors of Forum Energy Technologies Inc. include Cameron International Corporation, Schilling Robotics (U.K.), a FMC Technologies Inc. subsidiary, National Oilwell Varco Inc. (U.S.), and Weatherford International Ltd. (Ireland).

FIGURE 7 FORUM ENERGY TECHNOLOGIES INC.: COMPANY SNAPSHOT

Revenue*: The quoted revenue is for the Drilling and Subsea segment
Source: Annual Report, SEC Filings, and MarketsandMarkets Analysis
### 8.1.2 PRODUCT PORTFOLIO THE COMPANY OFFERS THE FOLLOWING PRODUCTS.

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Davis Non-Welded Centralizer</td>
<td>These are singular unit centralizers with an interlocking adjoinment between the end collar and bow spring, manufactured to comply with API Specification 10D.</td>
</tr>
<tr>
<td>Davis Non-Welded Semi-Rigid Centralizer</td>
<td>These centralizers have features similar to both spring bow and rigid centralizers. They comply with API Specification 10D.</td>
</tr>
<tr>
<td>Davis Non-Welded Turbolizer</td>
<td>These centralizers are equipped with metal fins placed on the bows to induce turbulence in the cement slurry during pumping operations.</td>
</tr>
<tr>
<td>Davis Extended Reach Equipment</td>
<td>These devices such as the flotation collar are designed for application in horizontal well bores. They act as a temporary barrier inside the casing.</td>
</tr>
<tr>
<td>Inflatable Packers</td>
<td>These are non-welded inflatable packers with a design that provides a sturdy and effective seal. They are suitable for drilling, completion, and work over requirements, pipeline testing &amp; repair, and offshore platform installation.</td>
</tr>
<tr>
<td>Inner String Cementing Equipment</td>
<td>They are offered in three variants, the Tag-In system, the Screw-In System, and the Latch-In system. Offered in various sizes and thread, float shoes with single or double-valve and with or without ports, float collars, and baffle collars.</td>
</tr>
<tr>
<td>Insert Float Valves</td>
<td>They are suitable for use in wells of moderate depth, equipped with API 8 round short thread or buttress casing.</td>
</tr>
<tr>
<td>Manual Fill Float Collars</td>
<td>They feature a flat concrete surface and load distributor plate for landing and sealing cement plugs. It is offered with pin and box thread connections, and also the double-box connections.</td>
</tr>
<tr>
<td>Manual Fill Float Shoes</td>
<td>They are designed to withstand high temperatures and pressures and large volumes of fluids pumped at high flow rates. They feature a simple design and ease of operation.</td>
</tr>
<tr>
<td>Multi-Purpose Float Collars</td>
<td>They are designed using glass-reinforced epoxy resin to maximize reduction of surge pressure and auto fill valve with a large inside diameter. The design maximizes drop ball sizes; allow longer circulation with harsher fluids at greater pump rates.</td>
</tr>
</tbody>
</table>
### Self-Filling Equipment
The company offers three variants of self-filling equipment’s pump converted, PVTS valve equipped automatic fill, drop ball converted automatic fill, and drop ball converted differential fill.

### Stage Cementing Collars & Equipment
The company offers three-stage collar design, mechanically or hydraulically opened tool, and a mechanically opened tool with an in-built inflatable packer.

### Davis-Lock Thread Locking Compound
It is a strong epoxy-based compound suitable for most threaded connections to prevent back-off and loosening of joints.

### Davis API Modified Thread Compound
These thread compounds are suitable for use on casing, tubing, in-line pipe, and conforms to the specifications of API Bulletin 5A2.

### Davis Non-Metallic Thread Compound
These thread compound are environmentally safer replacements for API modified thread compound that meets specifications in API Bulletin 5A2.

### Davis Super-Seal Thread Compound
These thread compound are manufactured to provide long lasting, high pressure sealing on all API threaded joints on tubing and casing.

### Type 778-100 Packer Stage Cementing Collar
It is a combination of inflatable packer and a stage cementing collar in a single unit.

Source: Company Website, SEC Filings, and MarketsandMarkets Analysis

### 8.1.3 KEY STRATEGIES
Forum Energy Technologies Inc. is a recently incorporated company, with limited operational experience of combined operations since its incorporation in 2010. It was formed by incorporating a number of companies specializing in different sub-domains of the oil & gas sector. This has assisted Forum Energy Technologies Inc. to establish its core competencies in a fairly shorter span of time.

Davis-Lynch was founded in 1947 and specializes in downhole completion and protection tools; it is now a part of Forum Energy Technologies Inc. since its acquisition in 2010. The casing and cementing products and services of the company are geographically more focused on the North American region, with few international operations in Latin American countries such as Ecuador, Venezuela, Colombia, and Mexico. The main driving force for its casing and cementing business is the level of well completion activities globally and complexity of well construction and completion processes.

### 8.1.4 DEVELOPMENTS, 2011

<table>
<thead>
<tr>
<th>Date</th>
<th>Approach</th>
<th>Description</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 2011</td>
<td>Mergers and Acquisitions</td>
<td>Forum Energy Technologies, Inc. acquired Pearland-based Davis Lynch LLC, a downhole cementing and casing manufacturer.</td>
<td></td>
</tr>
</tbody>
</table>

Source: Company Website, Annual Reports, and SEC Filings
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