

Market Intelligence Snapshot: Ground Engaging Tools

November 2019

INTRODUCTION

In the following report, Wakefield Research explores the market for ground engaging tools (GET).

After spending six figures on earth-moving machinery like excavators and loaders, it is easy to view ground engaging attachments as an afterthought. However, the market for ground engaging tools, the wearable metal attachments that make contact with the ground during construction and excavation, is changing rapidly as new manufacturing technologies evolve.

Ground engaging tools are specially designed metal tools that are attached to excavators, loaders, bulldozers, and other earthmoving machines. They serve a dual purpose in protecting structural components of the machines from wear and increasing the productivity of machines.

Over the next five years, the GET products market is expected to grow steadily as a result of increased construction activity and advancements in tool design. While replacement rates may slow in the long-term as equipment becomes more durable, the improved range of products will carry a higher price point and will result in increased demand for more-specific GET.

The goal of this report is to provide insights into the ground engaging tools market focusing on the following topics:

- Market size and growth projections
- Growth drivers and restrictors
- Types, manufacturing process, and lifespan of GET
- Notable manufacturers of GET

KEY FINDINGS

KEY FINDINGS – MARKET DYNAMICS

- Ground engaging tools differ greatly in size, shape, and purpose. Some prominent examples of ground engaging tools include **bucket teeth, adapters, lip shrouds, side cutters, and ripper shanks**.
- The global ground engaging tools market is worth approximately **\$1.1 billion in 2019**. The market is expected to grow at a rate of 7.6% over the next five years to reach a projected market size of **\$1.6 billion in 2024**.
- Growth in the ground engaging tools market is largely the result of **increasing construction and mining activity worldwide**. In the short term, **improving GET product design** is also leading to growth in the market as end-users replace their outdated tools with newer models.
- However, in the long term, **improvements in tool design may restrict market growth because better ground engaging tools do not need to be replaced as often**. The GET products market may also be restricted by some small construction and mining companies that **avoid replacing their ground engaging tools until doing so becomes absolutely necessary**.

KEY FINDINGS – GET PRODUCTS

- Ground engaging tools are most commonly manufactured through either **casting** or **forging**. **While cast tools are typically less expensive to manufacture, forged tools offer better strength and wear resistance.**
- The lifespan of ground engaging tools depends on a number of factors. These include the **tool material and manufacturing process, the type of material being mined with the tool, the terrain and climate where the tool is used, and the skill of the operator working with the tool.**
- Manufacturers of ground engaging tools include manufacturers of earthmoving machines that create GET products for their own machines and manufacturers of ground engaging tools for machines of different brands. Prominent machine manufacturers include **Caterpillar, Hitachi, John Deere, Komatsu, and Liebherr** while notable GET product manufacturers include **Columbia Steel, Combi Wear Parts, ESCO, H&L Tooth Company, and Metalogenia SA (MTG).**

MARKET OVERVIEW

GET: SMALL BUT IMPORTANT

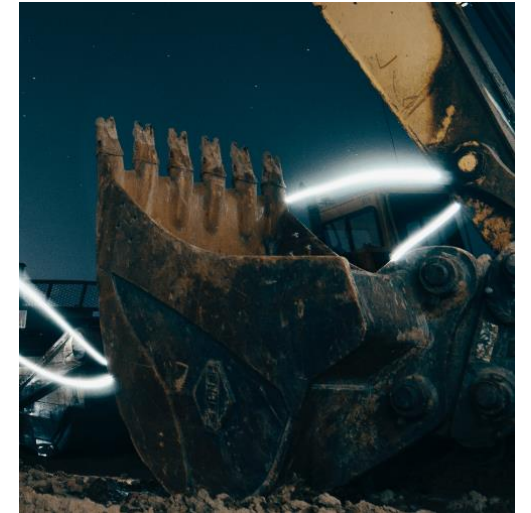
Wear and tear on earthmoving equipment is a substantial cost factor in both the construction and mining industries, and is particularly pertinent where machines have to handle abrasive materials. The most vulnerable parts of the equipment are those in direct contact with soil or mined materials, including, for example, dozer blades, and bucket lips and corners. To avoid having to replace entire attachments such as blades and buckets, earthmoving equipment operators use ground engaging tools (GET) to protect their equipment.

STEEL ALLOYS

Ground engaging tools (GET) are sacrificial pieces of metal that are attached to earthmoving equipment for the purpose of increasing machine productivity, and protecting the more expensive structural components of it. GET have to be made from harder materials with higher wear resistance than the original machine, typically steel alloys.






EASIER REPLACEMENT

Weld-on GET exist, but more recent product developments reveal a trend towards mechanically attached tools. Mechanically attached wear parts allow for much quicker replacement than welded-on versions, lessening equipment downtime. Innovative product offerings include “hammerless” ground engaging tools that can be exchanged easily by one person without further tools.



TYPES OF GET

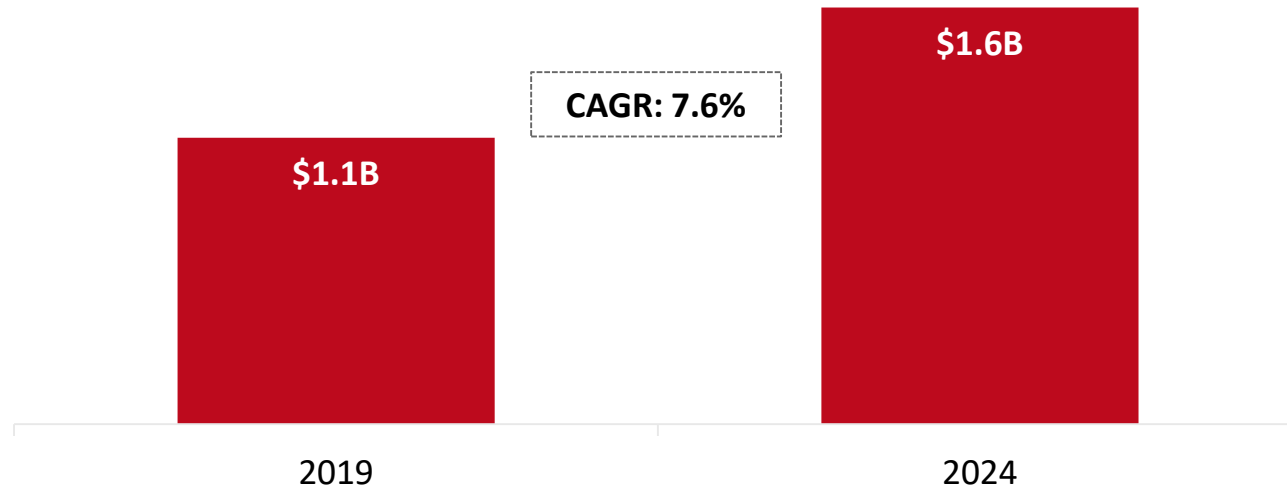
Ground engaging tools vary greatly in their size, shape, and purpose. Listed below are the most prominent types of GET.

	GET TYPE	DESCRIPTION
	Bucket Teeth	Bucket teeth are attachments for the buckets of excavators, loaders, bulldozers, and similar machines. They are designed to help the bucket dig into the ground.
	Adapters	Adapters, also known as tooth holders, use pins and retainers to hold the bucket teeth in place on the lip of the bucket. They can either be welded or bolted onto the bucket lip.
	Lip Shrouds	Lip shrouds are attachments for the bucket lip. They are attached in between the bucket teeth for added protection. Like adapters, they can either be welded or bolted onto the lip.
	Side Cutters	Side cutters are attachments for the side of the bucket. They offer added protection to bucket side plates and increase the capacity of the bucket.
	Ripper Shanks	Finally, ripper shanks are attachments for the back of earthmoving machines used in digging. Ripper shanks often feature shank protectors of their own.

MARKET SIZE

The global ground engaging tools market is estimated to be worth \$1.1 billion in 2019. It is expected to grow at a compound annual growth rate (CAGR) of 7.6% over the next five years to reach a projected market size of \$1.6 billion in 2024. Growth in the market will be driven by broader construction activity, but advancements in the manufacturing process are also seeing equipment owners replacing their GET with high-quality, more job-specific items.

GROUND ENGAGING TOOLS MARKET SIZE AND GROWTH PROJECTION



MARKET DYNAMICS

While the global market for ground engaging tools is forecast to grow due to increasing construction activity and advancements in tool design, the market is influenced by several factors.

GROWTH DRIVERS

Increasing construction and mining activity worldwide is leading to a growth in sales of earthmoving machines and other construction and mining equipment. Because such equipment typically requires ground engaging tools, growth in the construction and mining industries has resulted in a corresponding growth in the ground engaging tools market.

Furthermore, **manufacturers of GET products are constantly introducing superior tools with improved wear resistance.** This is leading to short term growth in the GET market as end-users replace outdated tools with newer models.

GROWTH RESTRICTORS

While improvements in tool design are spurring market growth in the short term, they also have the potential to restrict market growth in the future. This is because superior GET products have longer life-cycles and thus do not need to be replaced as often, thereby resulting in the sale of less GET products in the long term. These developments are leading some manufacturers to offer GET maintenance services.

The market for GET products is also being restricted by some small mining and construction companies that, as a cost cutting measure, avoid replacing their ground engaging tools until doing so becomes absolutely necessary.

MANUFACTURING PROCESS

Ground engaging tools are generally manufactured through either casting or forging. In some cases, bucket teeth are occasionally manufactured via fabrication.

CAST TOOLS

In the casting process, a mold of the desired tool is first created. Metal is then heated until molten and poured into the mold to acquire the desired shape. After it is cooled, the mold is removed and the resulting tool is heat treated for added toughness and resistance.



While cast tools still offer good strength and wear resistance, they are less durable than forged tools. Nonetheless, their relatively low price in relation to forged tools renders cast tools an attractive alternative for some end-users.

FORGED TOOLS

In the forging process, steel bars are cut to a specific size and heated until they can be shaped into the desired configuration. Once forged, the tools are heat treated to achieve maximum strength and resistance.

The forging process allows the metal to have a uniform grain structure which conforms to the shape of the forged part. This results in metal tools that are stronger, more resistant, and more durable than cast tools.

FABRICATED TEETH

Fabricated bucket teeth are manufactured from raw metal materials in two parts, the blade and the clip. Because the blade undergoes the most wear, it is made from stronger materials than the clip. The two are then welded together and heat treated for better wear resistance.

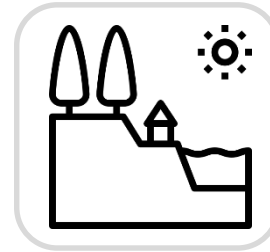
LIFESPAN OF GET

The lifespan of GET varies greatly based on a number of factors:



TOOL MATERIALS AND MANUFACTURING

The type of steel from which tools are made impacts how resistant they are to wear, with some steels being stronger than others. Similarly, the GET manufacturing method affects lifespan, with forged tools lasting longer than cast tools on the same projects.



TERRAIN AND CLIMATE CONDITION

Similarly, terrain and climate conditions can also affect the lifespan of GET. For example, tools are likely to wear out faster on rocky terrain in humid climates than they would on soft soil in more temperate locations.



TYPE OF MINED MATERIAL

The type of material being mined is also crucial in determining a GET's lifespan. Abrasiveness has a high impact on how quickly a GET component wears out. In mining, the least abrasive material is gold:








OPERATOR SKILL

Finally, operator skill also plays an important part in determining the lifespan of ground engaging tools. This is because inexperienced operators are more likely to make technical mistakes that can accelerate the wear on tools.

GET ORIGINAL EQUIPMENT MANUFACTURERS






Manufacturers in the GET market can be broadly divided into original equipment manufacturers (OEMs) of earthmoving machines that create replacement parts for their own machines and GET manufacturers that create tools for machines of different brands. Listed below are the prominent OEMs:

	COMPANY	HQ	REVENUE ESTIMATE*	COMPANY DESCRIPTION
	Caterpillar	Deerfield, Illinois	\$54.7 Billion	Caterpillar is one of the largest manufacturers of construction equipment in the world. The company also manufactures a wide range of GET products specifically designed for its various earthmoving machines.
	Hitachi Construction Machinery	Tokyo, Japan	¥9.5 Trillion	Hitachi is a major Japanese manufacturer of construction machinery and GET products including bucket teeth, lip and heel shrouds, and ripper shanks.
	John Deere	Moline, Illinois	\$37.4 Billion	John Deere is an American manufacturer of farming, forestry, and construction equipment. John Deere also manufactures a line of bucket teeth for both its own and other manufacturers' machinery.
	Komatsu	Tokyo, Japan	¥2.7 Trillion	Komatsu is a large Japanese manufacturer of construction and mining machinery. The company also offers a long line of GET products including bucket teeth, ripper shanks, side cutters, and more.
	Liebherr	Bulle, Switzerland	€10.6 Billion	Liebherr is a Swiss manufacturer of construction and mining equipment. Liebherr also manufactures GET products specifically designed to fit its buckets.

*The listed revenue figures are for the entire company, and not just its GET segment

OTHER GET MANUFACTURERS

The table below profiles the major ground engaging tools and wear parts manufacturers that DO NOT manufacture their own earthmoving machines:

	COMPANY	HQ	REVENUE ESTIMATE*	COMPANY DESCRIPTION
	Columbia Steel	Portland, Oregon	\$221 Million	Columbia Steel is an American manufacturer of steel and iron wear parts for various industries. The company's GET products include bucket teeth and adapters for draglines and mine shovels.
	Combi Wear Parts	Kristinehamn, Sweden	\$19 Million	Combi is a Swedish manufacturer of wear parts for the construction, mining, and dredging industries. Among its products, Combi manufactures cast bucket teeth, adapters, and lip and heel shrouds.
	ESCO	Portland, Oregon	\$772 Million	ESCO, a Weir Group company, is a manufacturer of metal components for industrial machinery. The company's GET products include bucket teeth, lip and heel shrouds, and side cutters.
	H&L Tooth Company	Montebello, California	\$13 Million	H&L Tooth Company is an American manufacturer of GET products. The company's comprehensive product portfolio includes bucket teeth, adapters, and ripper shanks.
	Metalogenia SA	Barcelona, Spain	\$78 Million	Metalogenia SA (MTG) specializes in the manufacturing of wear parts for earthmoving machines. The company manufactures bucket teeth, adapters, lip and wing shrouds, and other GET products.

*The listed revenue figures are for the entire company, and not just its GET segment



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