The company designs, manufactures and sells specialty material products that are mainly used in the aerospace and industrials.

Sell to three major end markets:

* Commercial aerospace (think Boeing and Airbus as customers)– 69%
  + Hexcel is a partner of a JV in Malaysia to manufacture composite structures in this end market
* Space and Defense (military planes) – 17%
* Industrial (cars, boats, ski products, etc) – 14%

Carbon fiber provides solutions that customers want due to its lightweight, strength, toughness, and low lifecycle cost.

\Composite solutions solve people’s problem by reducing weight while enhancing strength and durability.

Content on A350 is about $4.8m, is the largest program so far. Expected build rate is 10 per month. [check]

**2017 sales decine is a result of reduction in legacy wide-body sales**

**Revenue**

* Contract types? Terms? Fixed or variable pricing?
* COVID-19 impact on revenue? How long does it take for airplane production to pick up?
* Narrow-body vs Wide body content $?
* How did the company fare during the GFC and 9/11?
* Can customers terminate contracts? Or they are just deferring?

**Costs**

* What is the contribution margin?
* Fixed and variable mix?
  + It seems like the EP segment has a high ratio of fixed costs as the margin halved this quarter comparing to 1Q 2019.
* How well can the company pass the cost to customers?

**Products**

* What are the product categories?
  + Composite materials (CM) – 80% of rev

Less than 5% of total production of CM goes to the EP segment

* + Engineered products (EP) – 20%
    - So this whole department is basically a derivative of the CM segment.
    - What is the revenue and cost associated with this department? We should see a really favorable margin profile if raw materials comes form the CM segment
    - How much of the products in this segment come from the ACM JV?
* How do these products contribute to the topline and the costs?
* Are there heterogenicity in the product offerings (in other words, are there two categories that don’t share PP&E and costs)? Especially talking about ARC.
  + For some engineered products, the company can share the COGS because they use stuff from the composite materials segment
* ROICs on adjacent products? This is a possible value creation source.
* Are the parts highly critical to the plane? Do composite materials have a high switching cost for aircraft makers?

**Value Chain**

* How is the company vertically integrated?
  + Ok, so essentially saying that all products use Fiber as a raw material. Thus vertically integrated. Implying the at core, the company produces carbon fiber and through R&T, apply this raw material to other products.

**Market**

* Primary structure composite aircraft (A350, 787) industry and trend?
* Medium to heavy lift helicopter market growth? Also strike fighters.
* Is carbon fiber a fragmented place? No, many Japanese firms control the PAN and upstream value chain. However, according to the management, Hexcel has the largest CF capacity for aerospace qualified applications.
* How were the company’s acquisitions? Were they good decisions? They were either to expand CF capacacity to strengthen the upstream control, or to expand the product porfolios to drive innovation
* China market demand? China carriers have significantly more demand for Airbus than Boeing. Hexcel is more weighted toward Airbus, and the highest content value comes from Airbus. This relationship with Airbus would be a tailwind when the Chinese economy keeps grow.
* Interestingly enough, companies within the advanced composites industry can also be suppliers to their competitors. Which is why I think the vertical integration is such a value-add to Hexcel. It makes the competitors less competitive because Hexcel would have a higher bargaining power when it put on a suppliers’ mask.
* Solvay should be the most comparable competitor. What’s their relationship with Airbus? What parts of plane do they supply to?

**Manufacturing facilities**

* How many facilities do the companies’ competitors have?
* What’s the relationship between those facilities and customers’ assembly houses?

**Recent Development**

* Check the company’s past decisions on acquisition and partnerships to see the quality of those decisions.
* The company has adopted a limited period poison pill to prevent from hostile takeover. This is good because the fundamental business is solid, and it really aligns with shareholders’ interest
* Expect some furloughing and RDFs, management has cut back their compensations.

The composite materials industry is highly consolidated, with only five major competitors: Toray, Teijin (Toho Terex), Mitsubishi, Solvay (Cytec), and Hexcel. Toray is the market share leader, with Teijin and Mitsubishi not far behind.

There has been some consolidation in recent years. Solvay merged with Cytec in late 2015 for $5.5 billion. Toray acquired Zoltek in 2013 for $583 million. These M&As have made Hexcel the only public pure-play on the composites industry. Other competitors have composites at <30% of total sales and EBITDA. Hexcel is 80%+ composites, with a focus on the highest-growth segment in the industry: aerospace. Investors have historically valued the aerospace industry (and its corresponding suppliers) at a premium and have recently bid up the prices of many Trump-led defense stocks. Hexcel represents the intersection of this sentiment.

Hexcel’s oligopoly has little direct bidding competition. Supply agreements are characterized by multi-year contracts and many sole-source bids, reflecting competitors’ unwillingness to cross-compete, and OEMs’ unwillingness switch suppliers. For example, Hexcel has a multi-year supply agreement with Airbus for various end products; Toray has a similar agreement with Boeing. Towards ends of contract periods, OEMs tend to renew them and expand the applications to new product lines. Airbus recently added 13 years onto Hexcel’s supply agreement and expanded product coverage to various next-gen products. Similarly, Boeing recently added 10 years to Toray’s supply agreement and also expanded Toray’s product coverage to its new aircraft. The contracts comprise the majority of the respective suppliers’ sales to those end customers.

Substantial barriers to entry: design specifications for aerospace are extremely stringent, and OEMs are unwilling to incur the potential liabilities resulting from low- quality/unproven product. All business is therefore typically taken on only by the industry leaders and/or suppliers with existing relationships. Hexcel has entrenched itself as a leading supplier of composite materials to Airbus and Boeing, which we believe gives it a substantial advantage over potential competitors.

Investing for future growth: Hexcel has historically made several acquisitions and partnerships in order to remain on top of industry innovation. For example, between two investments in late 2014 and in early 2016, Hexcel acquired Formax UK, which is developing a new lightweight carbon fiber model for emerging industrial applications. Similarly, Hexcel has invested in/partnered with Carbon Conversions Inc. (carbon fiber recycling/repurposing), Oxford Performance Materials (3D printing) clearly this investment is paying off as Boeing just added Hexcel on its Qualified Provider List for its HexPEKK end-use components as well as the addictive manufacturing processing using laser sintering. , and several other smaller companies in order to best position itself for long-term innovation.

ARC Technologies: acquired in Jan, 2019. They are a supplier of custom RF/EMI and microwave-absorbing composite materials for military, aerospace and industrial applications.

Pure play nature, attractive to strategic buyers

**Value Creation 1**

~~We can gut the EP segment because it requires special machines that add additional layer of costs. And it’s a low margin business that drags down our overall margin. If we can gut it, we would have a better margin profile, and with the spinoff, we can actually add more revenue to the CM business segment, because that’s where we provide the raw materials.~~

~~100% of Cogs in CM segment only serves 95% of the revenue generated because 5% of the production goes to EP segment. If we gut the EP segment and sell 5% to third party customers, we can increase our margin in terms of both percentage and absolute value.~~

~~Is it a good investment in the JV? It seems as though we are supplying 100% of the cogs in exchange of 50% of earnings. But it benefits Boeing more because they are the customers, so they are only expending half the cogs for 100% of the products.~~

~~It’s logical that Hexcel would agree such deal because Boeing is the company’s second largest customer, who obviously has strong bargaining power. But with 737 Max debacle, we can leverage that to spin off the EP segment along with the ownership in the JV.~~

**Value Creation 2**

Medical

**Risks**

Highly dependent on commercial aerospace productions.

COVID-19 is not a cyclical event, without the virus, our economy is nowhere at a trough. However, the virus might shorten this business cycle and push our economy to a trough, if that happens during our investing horizon, it might take even more years to realize the true value of the firm

**Investment Merits**

* Dependable revenue stream from the strong and durable relationship with Airbus in the Commercial Aerospace market. The industry trend will lead to more replacement and newer plane models that require more composite makeups. **This is a risk, too**
* Vertical integration and advanced manufacturing processes drives high operating leverage that leads to significant high margin and ROIC
* The company is trading at the margin of safety zoon. What’s the doomsday case? Let’s just say aliens wipe out the entire company, the stock price would be 0, in that case. But our upside is at least $75 (which is the trading level INCLUDING the reduced volume from 737 Max). So, the doomsday scenario risk reward would be 1:2.
* Still deserves premium valuation because we need to look at ROIC and ROE. The sell side is saying that the company should see premium diminish because the growth opportunity is paring. But since the company has invested a lot earlier days, the company is able to maintain a superior ROIC, on that reason along, we should give the premium pricing to HXL.
* Potential merger with Woodward again. The industry is further consolidating. The termination is a mutual consent due to the current situation. But it is likely that both parties would reconsider the merger when things back to normal. So although this one is not modeled in, the likelihood should be significant enough for us not to ignore. If there’s an all-stock merger, we are essentially owning the #1 giant in the aerospace supplier industry. This is perhaps another factor contributing to the depressed price. People were obviously hyped up about the deal and the termination + the bleak aerospace outlook makes people overreact.
* Moat is strengthened by further acquisitions, creating a positive feedback loop. The company’s earlier acquisitions of the upstream supply chain gives it the ability to manufacture high quality carbon fibers with unique surface charactristics. And that allows the company to make more synergetic acquisitons. For example, the Oxford merger is highly synergetic as the Hexcel carbon fiber is preferable for addictive thermoplastic applications due the said surface features. The investment is paying off as Boeing just added Hexcel on its Qualified Provider List for its HexPEKK end-use components as well as the addictive manufacturing processing using laser sintering.



*\*LTM financials*

The gross margin is not the highest but the net income margin is the highest in the comp set. Prudent capital structure definietely helped. But for the EP segment, the fixed cost is higher.