

Source: <http://www.cfa-hq.org/industry/statistics.cfm>

END USE MARKET DEFINITIONS

1. **Aircraft/Aerospace/Defense:** This section includes all composite materials used in commercial, military or pleasure (general aviation) aircraft. Include any materials which are used in aerospace applications, as well as any uses for military or other defense applications. Include materials used for aircraft structures, as well as cabin interiors and accessories.

2. **Appliance/Business Equipment:** Materials used in household or commercial appliances (ranges, refrigerators, freezers, microwave ovens and small household appliances). Also include any materials for business equipment (telephones, answering machines, calculators, computers, typewriters, etc.)

3. **Construction:** Include shipments of products for general construction which are moving into residential and other construction applications that are primarily non-load bearing such as swimming pools, concrete forming pans, gutters and down spouts, cooling towers, sandwich components, highway delineators and signs and mobile homes (for year round living), bathroom components and fixtures (such as bathtubs, shower stalls, pans, lavatories, spas, whirlpools, jacuzzis, etc.). Report composite application shipments in which the end-user requires long term, load-bearing structural performance. Such applications include gratings, railings, catwalks, secondary and primary structural elements (I-beams, box beams, etc.), bridges and bridge components, structural framing systems, pilings and similar items.

4. **Consumer and Recreational:** Include all materials which are used to produce toys, bicycles and tricycles, all sports and recreational markets (i.e., fishing rods, skis, golf clubs, golf carts, tennis rackets, snowmobiles, bowling equipment, mobile campers, swimming pool equipment, etc.). Include service trays, lampshades, totes and boxes, counter tops, seating, furniture and microwave cookware in this category.

5. **Corrosion-Resistant Equipment:** This category includes pipe and fittings (pressure and non-pressure service), tanks (above ground, underground and wrapping), fittings, stacks, ducts and hoods, pumps, fans, containers, sucker rods and miscellaneous process equipment used in the chemical processing, pulp/paper, oil/gas and computer industries.

6. **Electrical / Electronic:** Includes rods, tubes, molded parts, pole line hardware, substation equipment, electronic microwave antennas, electronic connections, electrical enclosures and lighting. Include injection molded 3D boards and polyester panel boards but do not include traditional epoxy laminated printed circuit boards.

7. **Marine:** This section includes all composite materials used for pleasure boats, personal watercraft, naval boats and ships, racing craft, as well as commercial ships and component parts, equipment, motor covers, moorings, marina docks and floats.

8. **Surface Transportation**

a) SMC: Sheet molded composites (SMC) as used in the automotive industry. Include SMC used for both exterior and the “under the hood” applications.

b) Non-SMC: Composite material (exclusive of SMC) used for automotive (appearance parts, functional applications and structural components under the hood), trucks and truck trailers, buses, trains, subways, farm equipment, motorcycles, scooters, etc.).

9. **Other** (Non-classifiable): Include all other miscellaneous materials such as industrial machine housings and bases, tooling safety hats, dental/medical equipment and other products which do not fit any of the previous categories.

Total: The sum of the categories reported above, excluding non-reinforced.

Source: http://www.acmanet.org/industry/end_use_definitions.cfm

COMPOSITES MARKET Historical Growth and Forecasts

Larry Craigie

The Composites Statistics Committee meets biannually to prepare a forecast for the composites market. During the first meeting in late spring, they reflect on the previous year's forecast and make any needed corrections. Also they review and update the forecast for the current year. During the third quarter the team meets to prepare the forecast for the upcoming year and make any modifications to the current year's estimates. The forecast includes market predictions for each of the nine segments of the composites market. This team has data for composites market starting in 1960.

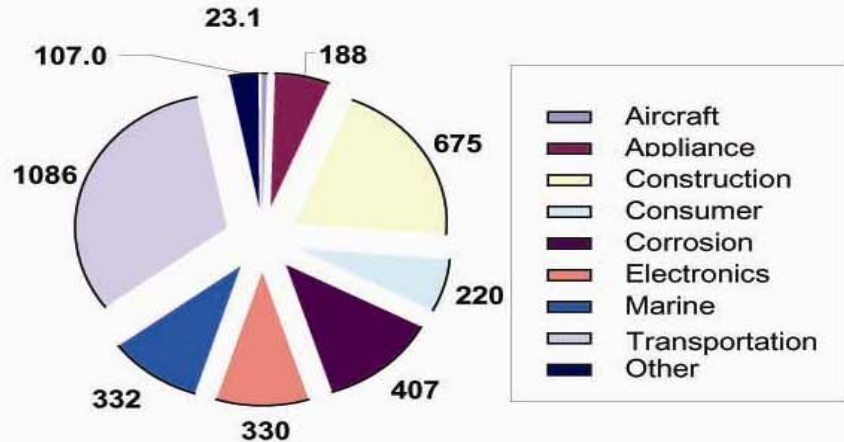
The definition of composites used by the committee is as follows: "Composites are a polymer matrix, either thermoset or thermoplastic, reinforced with a fiber or other material with a sufficient aspect ratio (length to thickness) to provide a discernable reinforcing function in one or more directions". To that end, included in these numbers is the total weight of composite shipments including all resins (thermoplastic and thermoset), gel coats, reinforcements, fillers and additives in their applicable market categories.

Aircraft/Aerospace /Defense sector is one of the smallest. The strong commercial aircraft demand and the increased use of composites in the new airplanes plus anticipate military spending has led to significant growth in this segment.

Appliance/ Business Equipment

This segment of the market includes materials used in household or commercial appliances and composites for business equipment.

2001 COMPOSITES DEMAND Millions of Pounds



The **Construction** sector includes fiber reinforced composites used for residential and commercial construction applications that are both non-load bearing structures and load bearing structures. The non-load bearing structures includes items such as swimming pools, concrete forming pans, cooling towers, sandwich components, highway delineators and signs and pre-manufactured homes, bathroom components and fixtures. Composite applications in the load-bearing structural category include such applications as gratings, railings, catwalks, secondary and primary structural elements (I-beams, box beams, etc.), bridges and bridge components, structural framing systems, pilings and similar items.

Consumer and Recreational sector includes all materials which are used to produce toys, bicycles and tricycles, all sports and recreational markets (i.e., fishing rods, skis, golf clubs, golf carts,

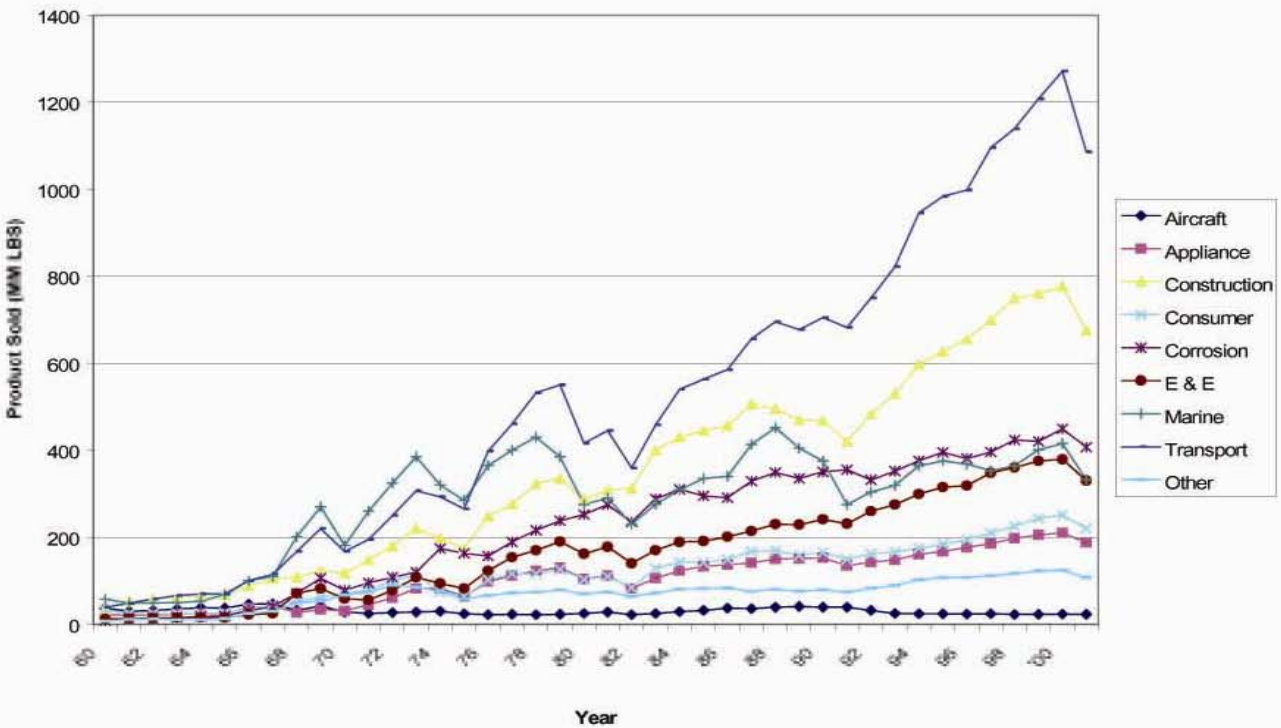
tennis rackets, snowmobiles, bowling equipment, mobile campers, swimming pool equipment, etc.). Also Included in this category are service trays, lampshades, totes and boxes, counter tops, seating, furniture and microwave cookware.

Corrosion-Resistant Equipment segment includes pipe and fittings (pressure and non-pressure service),

electronic microwave antennas, electronic connections, electrical enclosures and lighting. It also includes injection molded 3D boards and polyester panel boards but not traditional epoxy laminated printed circuit boards.

Marine segment includes all composite materials used for pleasure boats, personal watercraft, naval boats and

Composite Market Segments



tanks (above ground, underground and wrapping), fittings, stacks, ducts and hoods, pumps, fans, containers, sucker rods and miscellaneous process equipment used in the chemical processing, pulp/paper, oil/gas and computer industries. Strong sub-segments of this market are those geared toward oil and gas recovery.

Electrical / Electronic segment includes rods, tubes, molded parts, pole line hardware, substation equipment,

ships, racing craft, as well as commercial ships and component parts, equipment, motor covers, moorings, marina docks and floats.

The **Transportation** market segment includes SMC: Sheet molded composites (SMC) as used in the automotive industry. The segment encompasses SMC used for both exterior and the "under the hood" applications. Non-SMC: Composite material (exclusive of SMC) used for automotive (appearance parts,

functional applications and structural components under the hood), trucks and truck trailers, buses, trains, subways, farm equipment, motorcycles, scooters, etc.).

Other (Non-classifiable) includes all other miscellaneous materials such as industrial machine housings and bases,

tooling safety hats, dental/medical equipment and other products that do not fit any of the previous categories.

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