Research Report
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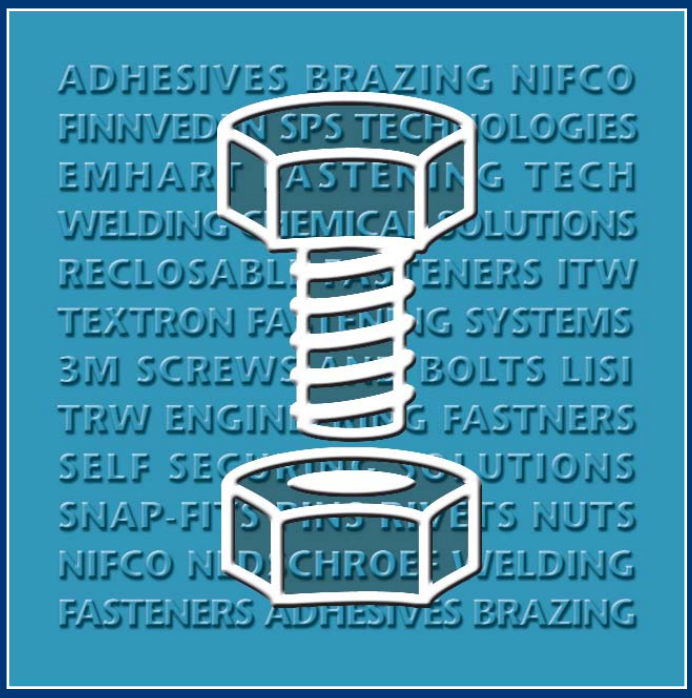
AUTOMOTIVE

Automotive fasteners: trends and market forecasts to 2007

by Matthew Beecham



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Chapter 1

Introduction

Keeping everything in place

The humble fastener has evolved from a mere commodity to a highly engineered, multi-purpose component. While the most common techniques include mechanical fastening such as riveting, threading and welding, chemical fastening methods are increasing in importance. Although adhesives have been used in vehicle production for years, they have been typically used in secondary applications such as stud/bolt locking, hem flange bonding or stiffener retention.

Growth in the adhesive market is being driven by strong end-user demand

Growth in the adhesive market is being driven by strong end-user demand and new product developments that enable adhesive compounds to increasingly serve as direct replacements for mechanical fasteners. Increased demand for high performance products that can replace mechanical fasteners and attach plastics, rubber and aluminium components are becoming more prevalent in new cars. The potential use of self-securing or 'snap-fit' solutions and the problematic field of bonding painted plastic parts together are also topical.

Vehicle makers are looking for more user-friendly fastening systems

Overall, vehicle makers are looking for more user-friendly fastening systems, which are economical to use. A vice president of a major automotive fastener supplier summed-up today's pressures: "Our customer's products are becoming lighter, smaller, thinner and less expensive. At the same time, performance requirements are more demanding with products becoming more complex and used under more difficult conditions. They require technology and innovative solutions on a global scale. It is no longer enough however, to focus just on technology and product solutions. We're also meeting the challenge to develop and use world-class business processes, such as e-commerce, and bring better and better focus on customer requirements in everything we do."

Report coverage

This report reviews the key market drivers for vehicle fastener systems. It provides some insights in a number of areas, including:

- The market for automotive fasteners, determining the trends and topical issues.
- The main manufacturers serving this sector.
- Trends in key product and process technologies, both current and future.
- Market forecasts for mechanical and adhesive fastener volume demand through 2007.
- OEM trends and rationale in adopting different types of fastening techniques.

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Manufacturers report an increase in the use of olefins

As the drive towards saving weight and cost in vehicle manufacturing continues, manufacturers report an increase in the use of olefins. In fact, bonding olefins is a challenge that all adhesives manufacturers face. Another challenge facing manufacturers is in anticipating trends far enough in advance so that the group has a portfolio of adhesives and tapes that can be used with new materials. For example, in anticipation of a trend in the increased use of plastics in automobiles, 3M developed its DP8000 series of structural adhesives for TPOs (thermoplastic olyolefin).

Low surface energy bonding presents a major challenge for the adhesives industry

Low surface energy bonding inherent in some new automotive materials also presents a major challenge for the adhesives industry. Adhesive manufacturers have seen this trend evolving for many years and most, in response, have developed a broad category of performance products including solutions from high-strength structural adhesives to PSA (pressure sensitive adhesives) tapes.

Manufacturers also report a trend toward the increased use of thermal formed parts. This process is used for consoles, dashes, instrument panels, door panels, etc. An adhesives manufacturer told us: "As always, the plants want a product that works quickly so that it will fit into their processes. They want a product that does not require 'fixturing' or cure times. They want to apply the adhesive and send it down the line. In addition, they would prefer the adhesive to be water based, with a heat resistance of -40^{0}C to +105^{0}C."

Market trends

Overview

Fastener manufacturers expect further consolidation

During the 1980s and 1990s, the fastener industry consolidated. Some fastener producers combined to form more diversified manufacturing concerns whose greater resources provided better equipped laboratories, more professional quality engineers and more modern practices. Improved manufacturing and procurement practices, coupled with quality systems such as QS 9000, provided a 'closed loop' between fastener manufacturers and their customers. Going forward, fastener manufacturers expect further consolidation, as one supplier said: "We are already seeing in this past year a lot of the North American standard threaded fastener producers either divesting their business or financially not being able to continue. We will see that continue. No question about it." In predicting the smaller fastener manufacturers' future in North America, another major producer said: "If they can identify local customers or have an innovative product required by the OEM, then they definitely have a chance of survival."

According to Sweden's Finnveden, Europe's fifth largest supplier of automotive fasteners, the major vehicle makers currently have between one and five fastener suppliers compared with more than five in the early 1990s. In its latest annual report, the company stated: "The capability of assuming total responsibility is becoming an increasingly important factor, as is the suppliers' competence to participate in the development process, from concept to completed vehicle. As a whole, this means that there are more exacting demands for geographic presence and for technical, production and logistical resources to maintain competitiveness."

The quality of the product has improved, too. In the late 1970s, end-of-line testing was the main method for assessing automotive parts quality. At that time, fastener defect rates were typically in the range of 65,000 parts per million (ppm). In recent years, however, as the focus has shifted from after-the-fact detection of errors to prevention of errors, the industry has seen defect rates fall to less than 100 ppm. This significant improvement is due to the introduction of improved technology, manufacturing processes and quality management techniques. In September 2001, Ford recognised the adhesive and sealant manufacturer, Henkel Loctite Corp. (formerly Loctite Corp) with its Zero Defect Award for providing products that have resulted in zero defects for four consecutive years at Ford's Lima, Ohio, engine-manufacturing plant.

There are around 12 - 15 applications for these products, ranging from the headliner to door panels to carpets to various places under the hood. The unit value of each application, however, can vary immensely from around 25 cents for a spare tyre cover to $3 for a set of hook and loop products designed to hold up the headliner.

3M, Loctite and Bostik are among the few major manufacturers that dominate the sector

On the adhesives side of the business, 3M, Loctite and Bostik are among the few major manufacturers that dominate the sector. The global fastener market (all applications, not just automotive) is estimated to be worth $36 billion, of which threaded fasteners is reckoned to be worth $26 billion. No competitor has more than a 9% market share.

Competition is based primarily on price, quality, reputation and delivery. In addition, larger customers of fastening systems tend to procure products and services from the larger suppliers, except for 'niche' products that may be sourced from smaller companies. Some automotive fastener manufacturers of relatively sophisticated products with strong market niches have reported intense price competition and declining profit margins and revenues. In some cases, they have responded by closing and consolidating plants, exiting certain product lines, downsizing infrastructure or moving the manufacture of certain product lines to Asia.

On the aftermarket side of the auto business, adhesives content of cars has been increasing as adhesives achieve design wins at the expense of mechanical fasteners and welds. While a few major players dominate the top third of the automotive adhesives market, the sector as a whole remains fragmented. For example, in the automotive glass bonding aftermarket in North America, five suppliers collectively control the market: Dow Automotive leads by some margin, followed by Sika, 3M and then, trailing some way behind are Adco and Dinol. Here, adhesive cure time drives product innovation, enabling the car to return to the road as quickly as possible.

Market forecasts

Industry sources estimate that around 10% of total adhesive production goes into vehicle manufacturing

Industry sources estimate that around 10% of total adhesive production goes into vehicle manufacturing. Today, an average saloon contains about 15 kilograms of adhesive. Although the global automotive market volume per vehicle for adhesives is reckoned to be rising at around 2% - 3% annually, the underlying trend is vehicle production, hence the slight dip in volumes across Western Europe and North America in 2002-03. Table 1 sets out ABOUT Automotive's estimates and forecast for automotive adhesives in metric tonnes through 2007. The Asia-Pacific region shows the greatest potential for market growth, mainly thanks to China and its predicted car production volumes through this decade.

Table 1: Demand for automotive adhesives, Western Europe, North America, Japan, Asia-Pacific, South America, 2002 - 2007 (Metric tonnes)

	2002	2003	2004	2005	2006	2007
Western Europe	219,100	213,100	221,800	233,200	2,300	,300
North America	246,500	243,900	00	57,	,500	
Japan	7,300	00	00	5 0	,500	1 500
As acific	200	3,	3 00	8,200		193,800
Sou erica	0	70	29 0	33,400	36,000	38,000
Total	744,	731,600	791,700	833,200	872,600	903,700

Sources: ABOUT Automotive, Auto Research Analysts, industry estimates.

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