

# Commodity Chemicals

## Paints, Coatings, and Adhesives

### Growing but Slowing, According to The ChemQuest Group

- **PAINT GROWTH BETTER THAN GDP.** The \$16.4 billion U.S. paints and coatings industry exceeded GDP growth in 2002, driven largely by the housing and auto markets. Volumes grew by 5%, with sales increasing by 4%. Architectural coatings, which is 44% of the U.S. paints and coating market, was the key growth driver (volume 9.6%, sales 6.6%), benefiting from lower interest rates.
- **ADHESIVES OVERCAME DECLINES IN TRANSPORTATION.** Similar growth was experienced in the \$10.2 billion U.S. adhesives industry, with 4% sales growth driven largely by construction, replacement of mechanical fasteners, and continued growth in pressure-sensitive adhesives. Construction, transportation, and packaging end-markets grew above GDP levels, but were mitigated by a 30% sales decline in aircraft/aerospace.
- **GROWING BUT SLOWING IN 2003.** Growth is likely to be tempered in 2003. Among the key factors for caution are weak industrial manufacturing, a poor aerospace market, and the continued shift of OEM business to China. Volumes are expected to grow 2% and sales 3%; adhesives should be slightly better at 5% sales growth.
- **MARGIN SQUEEZE LIKELY TO CONTINUE.** Rising raw material prices are likely to increase COGS for paint companies by 2% in 2003, as both resin suppliers and TiO<sub>2</sub> producers are successfully pushing through price increases due to escalating energy and feedstock costs. Margins are also likely to be squeezed by the increasing power of consumers. Price increases have been difficult for many paint manufacturers (except at company-owned stores that cater to contractors), as big box retailers continue to resist any pass-through price increases.

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# BEAR STEARNS

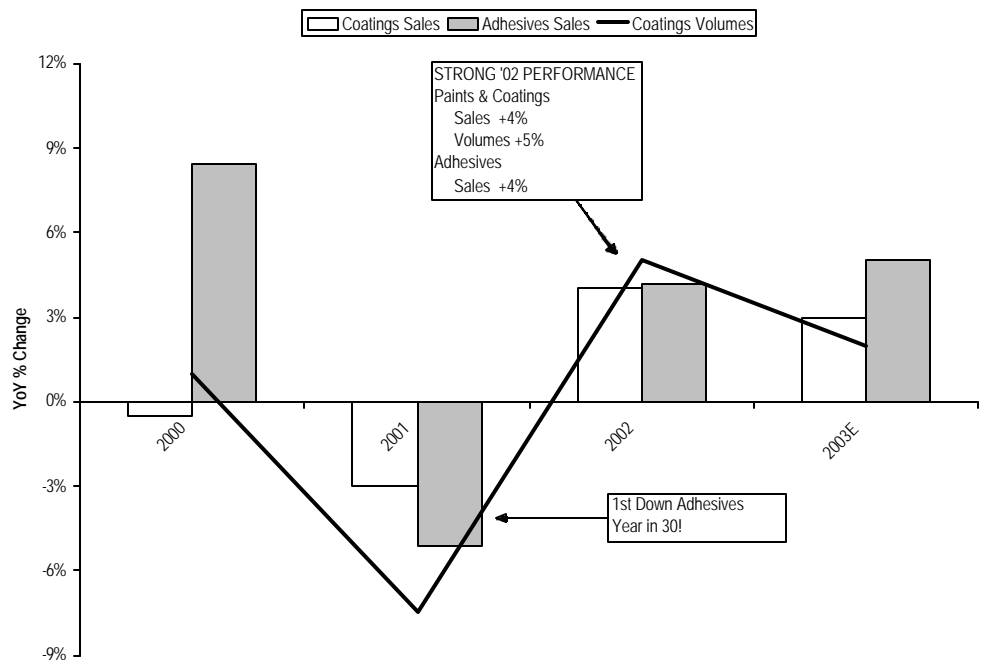
## Executive Summary

We recently hosted a conference call with The ChemQuest Group and gathered the following insights into paints, coatings, and adhesives, a major industry segment for chemicals.

### U.S. PAINTS, COATINGS, AND ADHESIVES

The \$16.4 billion U.S. paints and coatings industry exceeded GDP growth in 2002, driven by the housing and auto markets. Volumes grew by 5%, with sales increasing by 4%. Similar growth was experienced in the \$10.2 billion U.S. adhesives industry, with 4% sales growth driven by the construction, transportation, and packaging industries, but largely offset by a declining airline industry. Growth is likely to be tempered in 2003. Among the key factors for caution are continued weakness in industrial manufacturing, a poor aerospace market, and the continued shift of OEM business to China. Coatings volumes are expected to grow 2% and sales 3%, with adhesives slightly better at 5% sales growth.

Exhibit 1. U.S. Paints, Coatings, and Adhesives Sales and Volumes, 2000-03E



Source: The ChemQuest Group, Inc.; Bear, Stearns & Co. Inc.  
[II.xls \(executive summary\)](#)

[i:\shared\mitsch\paints coatings adhesive report\charts](#)

### A LARGELY CONSOLIDATED INDUSTRY . . . WITH OPERATING EFFICIENCIES KEY TO SUCCESS

Consolidation has been a key to profitability for the past three decades as a means of maintaining low-cost positions, resulting in a 57% decline in the number of coatings companies. Adhesives consolidation is slightly behind in consolidation, with the top eight adhesives players accounting for less than 50% of the market.

## Exhibit 2. Top Players in the U.S. Paints, Coatings, and Adhesives Industry

Paints and Coatings			Adhesives			
Architectural	Product OEM	Special-Purpose	Construction	Transportation	Packaging	Pressure-Sensitive
Sherwin-Williams	DuPont	PPG	Sovereign	Eftec	National Starch	3M
ICI	PPG	DuPont	H.B. Fuller	Henkel	HB Fuller	Avery-Dennison
Akzo	Akzo	Akzo	RPM	Ashland	Henkel	Air Products
Valspar	BASF	RPM	Sika	Bostik Findley	Forbo	ICI
	Valspar	BASF	Mapei	3M	Bostik Findley	Bostik Findley
			SKW	Rohm and Haas		HB Fuller
						Rohm and Haas

Source: The ChemQuest Group, Inc.; Bear, Stearns & Co. Inc.

[charts I.xls \(executive summary\)](#)

Industrywide margin squeezes are likely to further consolidation. Raw material suppliers have increased prices due to rising energy costs, while large big box retailers (Home Depot and Lowe's) continue to resist any pass-through price increases. Benefits of low-cost positioning and more efficient product development are likely to further fuel industry growth.

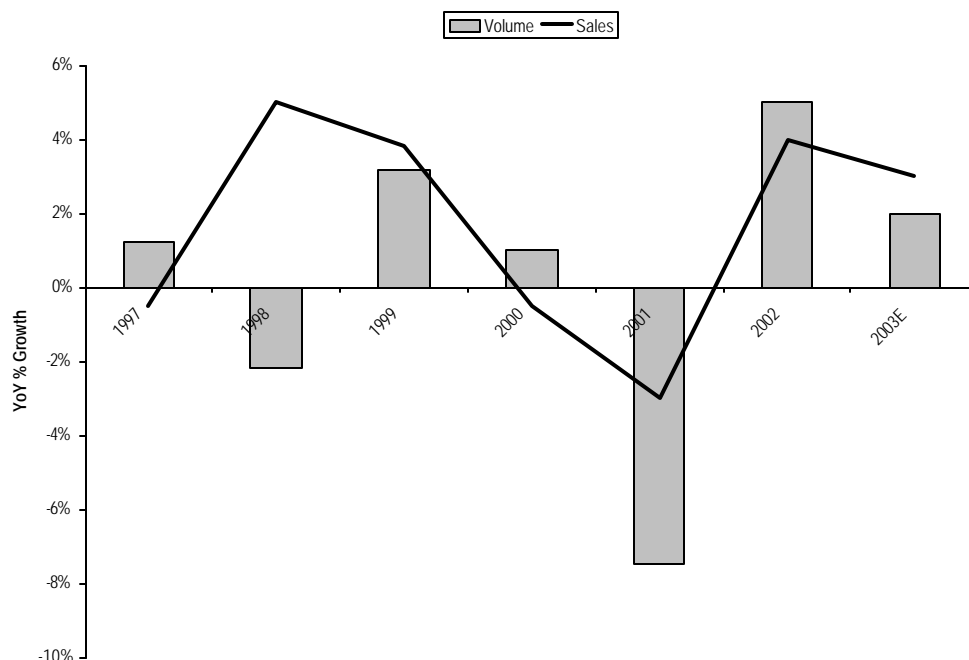
## U.S. Paints, Coatings, Adhesives: Growing but Slowing

### PAINTS AND COATINGS OVERVIEW

The \$16.4 billion U.S. paints and coatings industry showed decent growth in 2002 after a poor 2001, driven largely by the housing and auto markets overall. Volumes grew by 5%, with sales increasing by 4%. Lower mortgage and automobile financing rates were key positives, but lower infrastructure spending and the declining airline industry were moderating factors.

Growth in 2002 was similar to peak levels reached in 1999, and significantly higher than the historic five-year CAGR of flat volume growth and 2% sales growth. However, growth is expected to moderate in 2003, as shown in Exhibit 3.

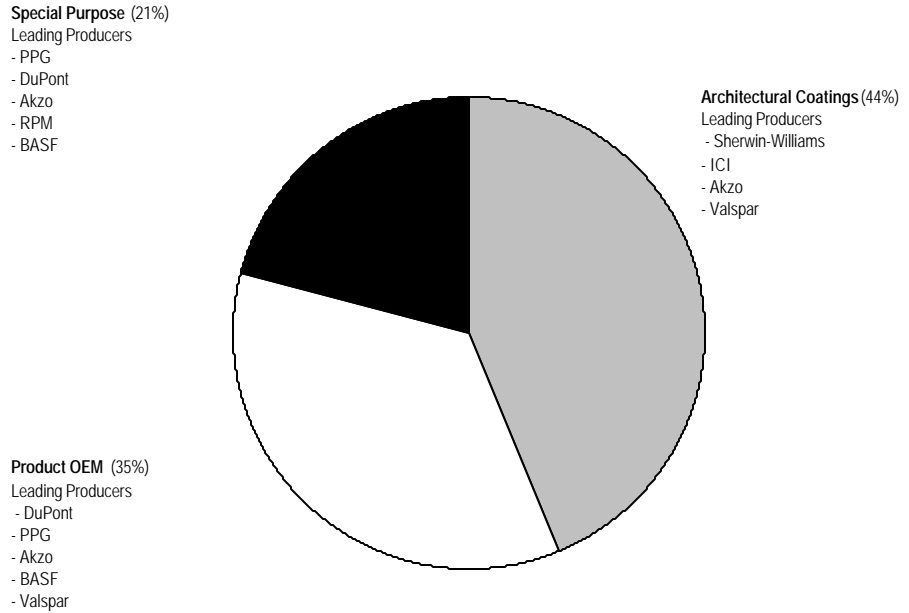
Exhibit 3. U.S. Coatings Sales and Volume, 1997-2003E



Source: The ChemQuest Group, Inc.; Bear, Stearns & Co. Inc. estimates. [charts II.xls \(ex1\)](#)

Paints and coatings provide two primary functions — decoration and protection. Architectural coatings account for the majority of end-use, primarily for decorating and protecting residential housing. Another 35% of coatings is used to protect industrial products (product OEM). The remaining end-use sales are special purpose coatings, which are used for miscellaneous applications such as traffic paints, automotive refinishing, high-performance coatings for industrial plants, etc.

**Exhibit 4. U.S. Paints and Coatings Segments and Producers**



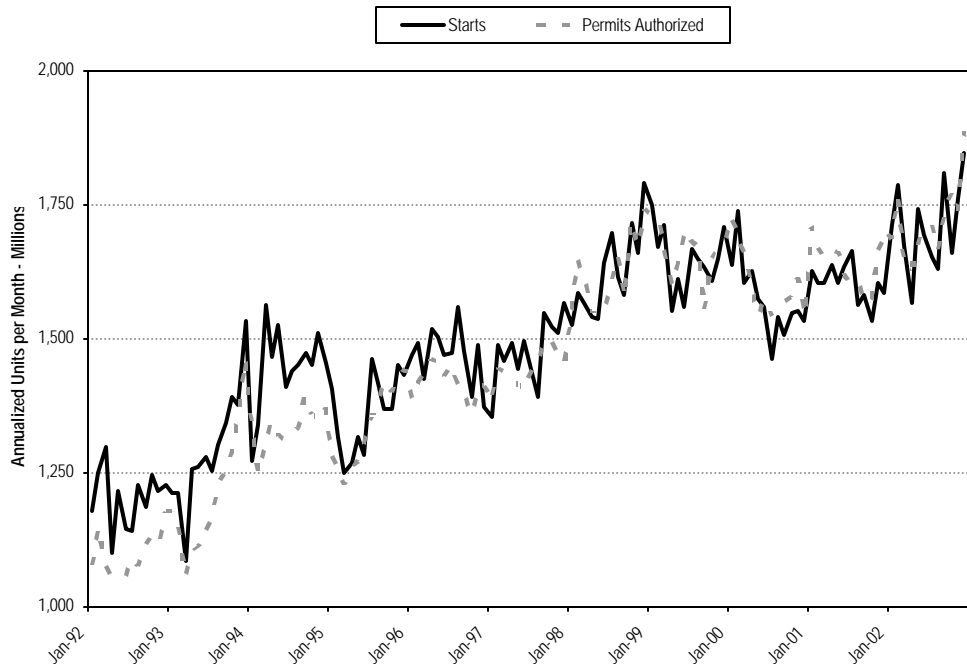
Source: The ChemQuest Group, Inc.; Bear, Stearns & Co. Inc. [charts 1.xls \(ex2\)](#)

**ARCHITECTURAL COATINGS**

**The Primary 2002 Industry Driver — Growth: 9.6% Volume, 6.6% Sales**

Architectural coatings volumes — 44% of the U.S. paints and coatings market — grew by 9.6% and sales grew by 6.6%, driven primarily by the robust new housing market and remodeling demand. New housing starts remained at near-record levels, totaling 1.7 million units, with permits authorized reaching similar record levels, as shown in Exhibit 5.

**Exhibit 5. U.S. Housing Starts and Permits Authorized, 1992-2002**

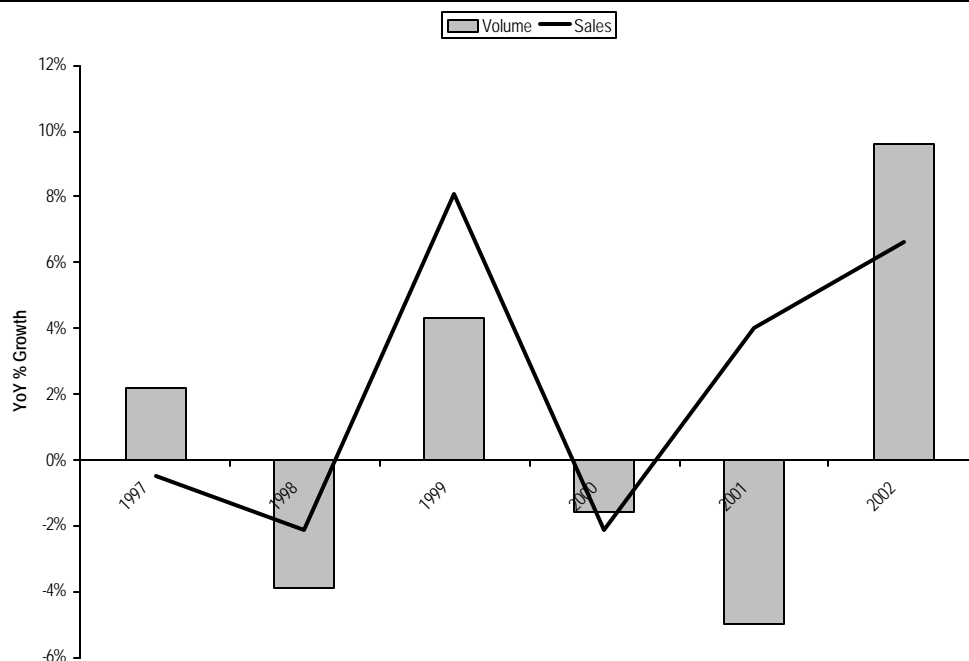


Source: U.S. Government Census; Bear, Stearns & Co. Inc. [exhibit 3.xls](#)

Sales of existing homes reached a record 5.5 million units. Larger home trends benefited the sector, as the median size of a new home grew by 38% (by square footage) over the past decade. Remodeling projects also increased, as a lower interest rate environment injected more cash for homeowners through increased refinancing.

Sales of existing homes and solid growth in new construction permits led to strong conditions for architectural coatings, well ahead of its five-year historic CAGRs of 1% in volume and 5% in sales, as shown in Exhibit 6.

**Exhibit 6. Architectural Coatings Sales and Volume, 1997-2002**

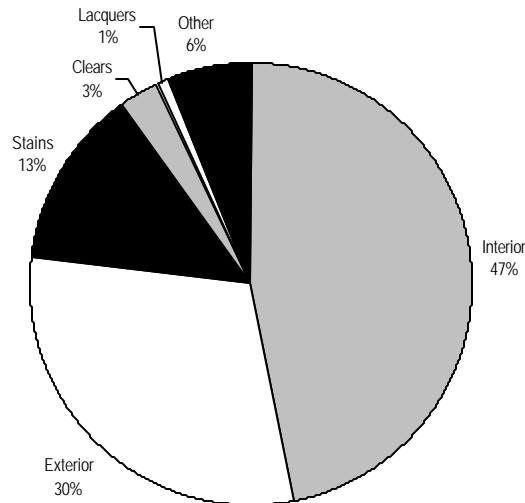


Source: The ChemQuest Group, Inc.; Bear, Stearns & Co. Inc. [charts II.xls \(ex4\)](#)

***Interior and Exterior Paints Account for the Majority of End-Markets***

Architectural coatings caters to several end-markets. Interior and exterior are the major end-uses, accounting for 47% and 30% of total architectural coatings sales, respectively, as shown in Exhibit 7. Key players in architectural coatings include Sherwin-Williams, ICI, Akzo, and Valspar.

## Exhibit 7. U.S. Architectural Coatings End-Markets



Source: The ChemQuest Group, Inc.; Bear, Stearns & Co. Inc.

[charts I.xls \(ex5\)](#)

### ***Paint Contractors Are the Major Customers***

The majority of residential work is done by contractors, as many consumers outsource professional work for remodeling projects. Contractors are responsible for 65% of paint purchased, while DIY customers make up the remainder. Paint stores dominate the contractor side of the market, satisfying 95% of demand.

Home centers have a 3.5% market share and are vigorously trying to advance their position by offering personalized service and flexible credit plans. However, large contractors tend to be very brand loyal and prefer to deal with company-owned stores. Sherwin-Williams is the leader in ownership of company-owned stores.

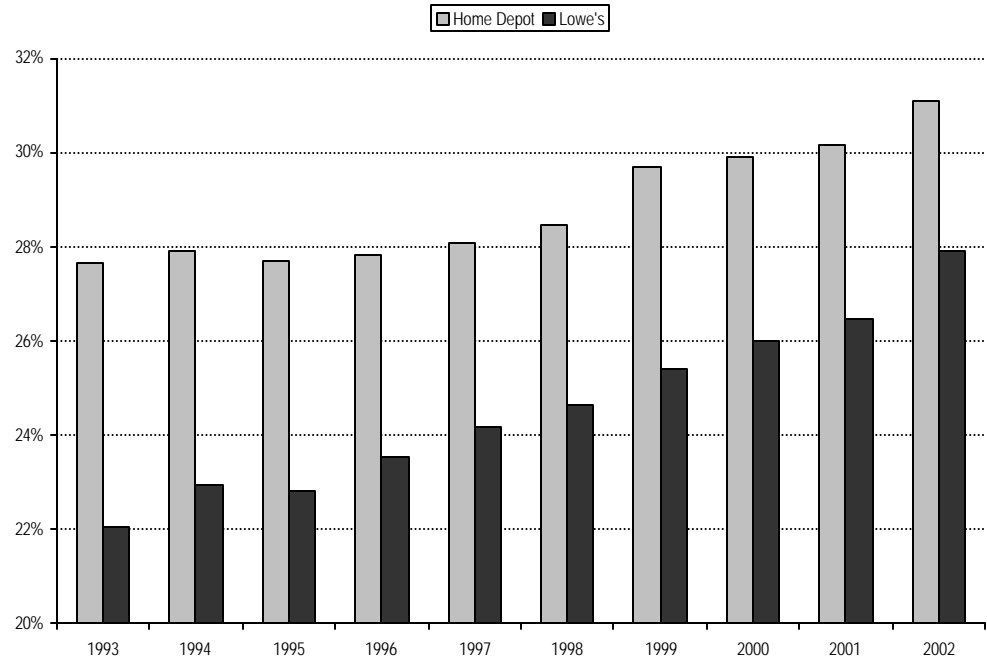
### ***Home Centers Dominate the DIY Markets***

Home centers have the leading position in the DIY market and continue to grow market share. Home centers now account for 46% of the market, compared with 30% in 1996. Competitive prices and more user-friendly displays have fueled DIY growth.

Home Depot and Lowe's are the nation's two largest home centers, representing 24% of total DIY distribution. The two largest home centers continue to grab DIY market share at the expense of other suppliers. Mass merchandisers' market shares have declined by 6% in the past five years, paint stores have lost 2%, and hardware stores have lost 6%.

Home centers have also been able to increase their margins by leveraging their market size with suppliers. Increased growth of the home centers has had a profound effect on limiting price increases by paint companies in the DIY channel. Exhibit 8 shows the consistent margin expansion for home centers as they increase their market share in the DIY chain.

Exhibit 8. Home Center Gross Margins, 1993-2002



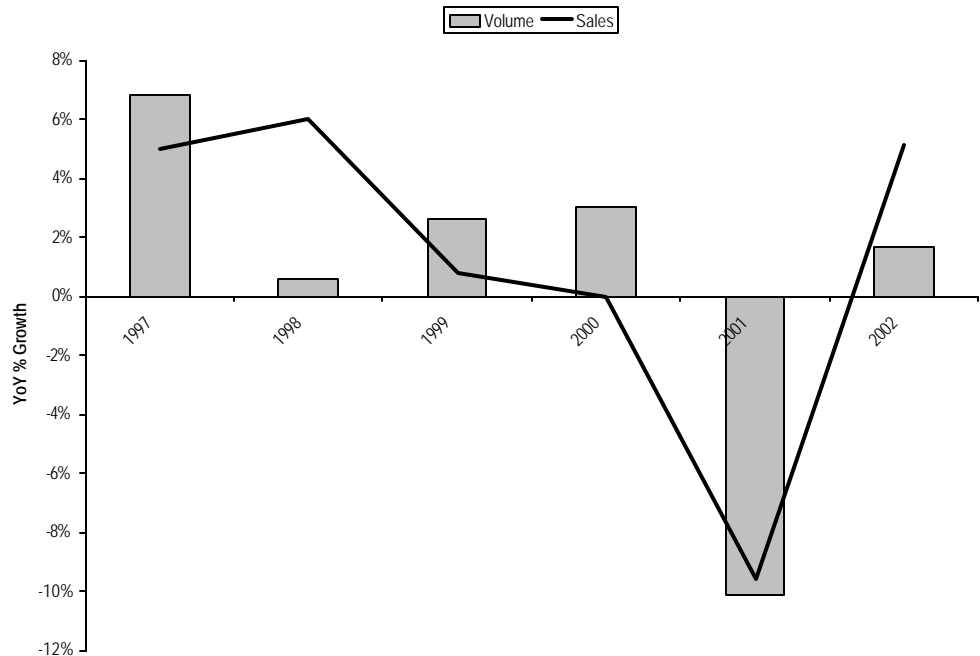
Source: FactSet Research Systems Inc.; Bear, Stearns & Co. Inc. [charts I.xls \(ex6\)](#)

**PRODUCT OEM**

**Modest Growth in Product OEM (Volume 1.7%, Sales 5.1%)**

Product OEM had moderate volume growth (1.7%), but sales increased nicely (5.1%). The key drivers are higher petroleum industry capital expenditures, increased military spending, and pre-buying in the transportation industry.

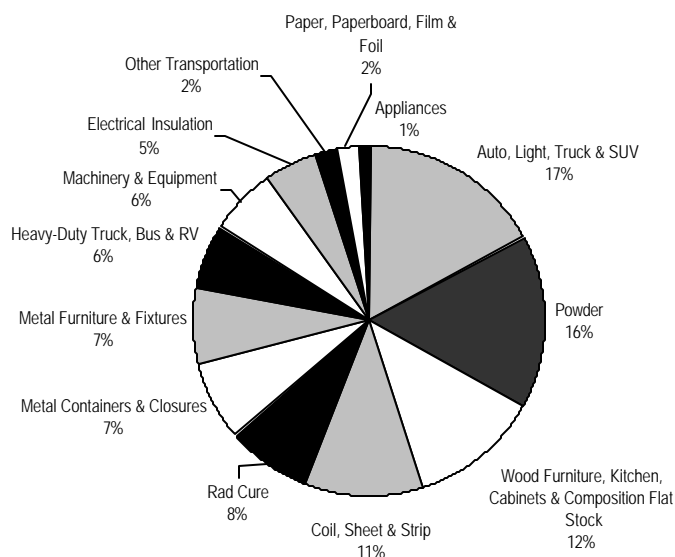
Exhibit 9. Product OEM Coatings Sales and Volume, 1997-2002



Source: The ChemQuest Group, Inc.; Bear, Stearns & Co. Inc. [charts II.xls \(ex7\)](#)

Product OEM coatings represent 35% of the total U.S. coatings market and are the coatings used for industrial manufacturing and production. This segment serves several industrial markets (see Exhibit 10), with such diverse end-markets as autos, light trucks, sport-utility vehicles (SUVs), powder, wood furniture, kitchen cabinets, and composition flat stock. Key players in the business are DuPont and PPG.

**Exhibit 10. U.S. Product OEM Coatings End-Markets**



Source: The ChemQuest Group, Inc.; Bear, Stearns & Co. Inc.

[charts I.xls \(ex8\)](#)

**Higher Volumes in Heavy Duty Trucks, Offset by Airlines Decline**

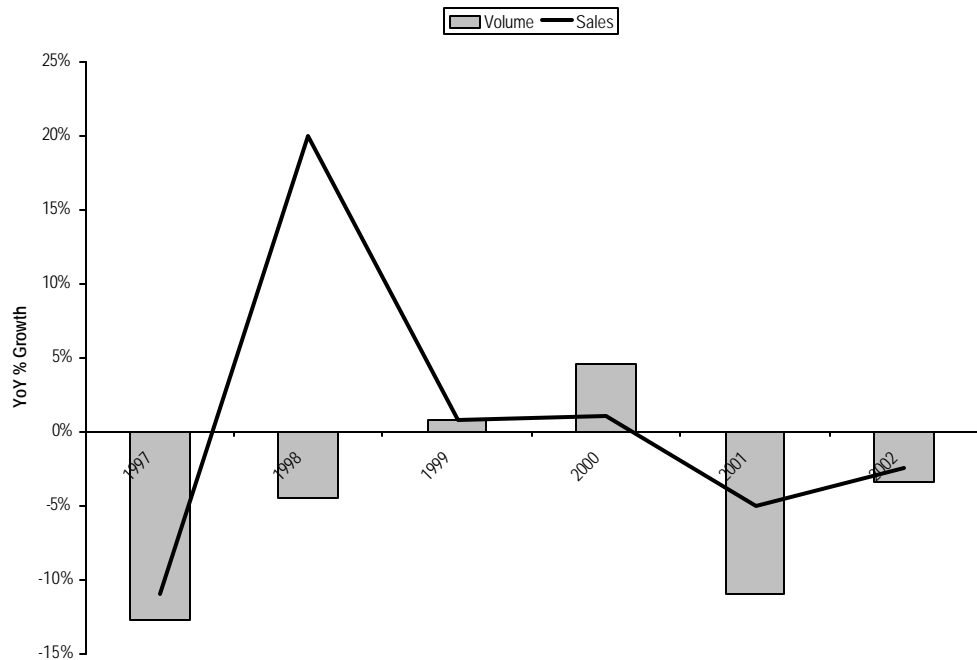
Heavy duty light trucks experienced higher volumes from pre-buying ahead of heightened environmental regulations. Volumes also improved by increased capital expenditures in the petroleum industry as crude oil prices remained well above reinvestment levels. However, overall volumes were dragged down by a more than 30% decline in the airline industry and the increasing shift of OEM business to China.

**SPECIAL PURPOSE**

**Continuing to Decline (Volume Negative 3.5%, Sales Negative 2.5%)**

Special purpose experienced both declining volumes (down 3.5%) and sales (down 2.5%) as state infrastructure expenses were reduced and automotive refinishing volumes trended lower. Special purpose coatings — approximately 20% of the U.S. market — have generally seen higher prices but lower volumes over the past few years.

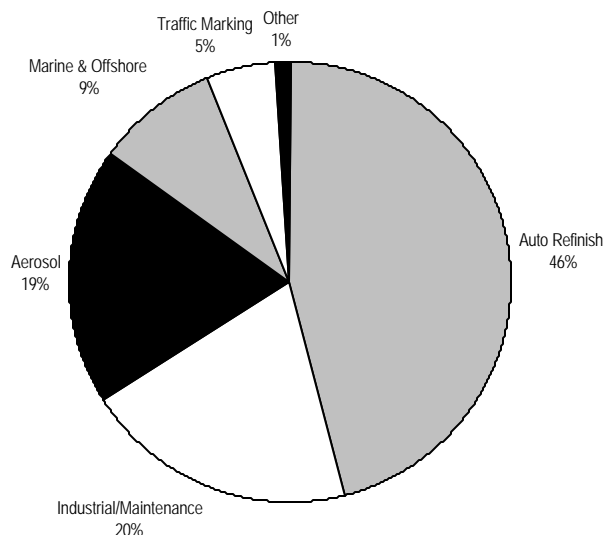
**Exhibit 11. Special Purpose Coatings Sales and Volume, 1997-2002**



Source: The ChemQuest Group, Inc.; Bear, Stearns & Co. Inc. [charts II.xls \(ex9\)](#)

Special purpose coatings are used in various applications, including automobile repair, aerosol paints, traffic marking, and corrosion protection coatings for industrial maintenance of facilities and infrastructure. This category is heavily reliant on the auto refinish markets, which make up 46% of the total. Significant players in special purpose coatings include PPG, DuPont, Akzo, RPM, and BASF.

**Exhibit 12. U.S. Special-Purpose Coatings End-Markets**



Source: The ChemQuest Group, Inc.; Bear, Stearns & Co. Inc. [charts I.xls \(ex10\)](#)

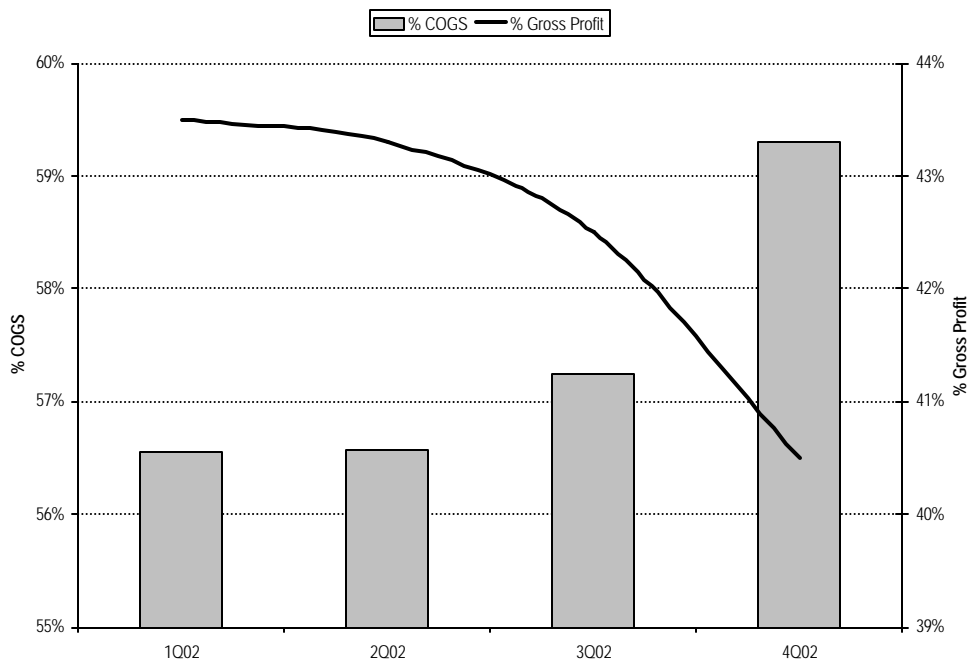
**INDUSTRY TRENDS**

**Coatings Margin Squeeze**

Rising raw material prices are likely to increase cost of goods sold (COGS) for paint companies (i.e., Sherwin-Williams, Akzo Nobel, ICI, etc.) by 2% in 2003. Both resin

suppliers (i.e., Dow, Rohm and Haas, etc.) and TiO<sub>2</sub> producers (i.e., DuPont, Millennium, etc.) are successfully pushing through price increases. Raw materials in practically every class of goods have been steadily rising over the last year due to the rise in crude oil and natural gas affecting raw material and energy costs, and have affected margins (see Exhibit 13).

**Exhibit 13. Raw Material Impact on the U.S. Coatings Industry, 2002**



Source: The ChemQuest Group, Inc.; Bear, Stearns & Co. Inc. [charts II.xls \(ex11\)](#)

Moreover, consolidation by key suppliers over the years has led to more competitive raw material pricing.

**Exhibit 14. Key Suppliers** (by order of profitability of segment/technology)

Raw Material Supplies	Key Suppliers
TiO <sub>2</sub>	DuPont, Millennium, Kerr McGee, Kronos
<b>Resins</b>	
Polyurethane	Bayer, Crompton, Dow, Avecia, Noveon, BASF
Epoxy	Dow, Resolution Performance Products
Acrylic	Rohm and Haas, Dow, Reichhold, Eastman
Vinyls	Dow, Rohm and Haas, Air Products, Reichhold
Alkyd	Eastman, Reichhold
<b>Intermediate Monomers</b>	Rohm and Haas, Dow, Celanese, BASF, Total Fina, Ineos

Source: The ChemQuest Group, Inc.; Bear, Stearns & Co. Inc. [charts I.xls \(ex12\)](#)

Paint company margins will also be squeezed as big box retailers continue to resist any pass-through price increases. Such players as Lowe's and Home Depot continue to grow in size and are able to manage margins more effectively. Paint companies attempted to raise prices, but only received a 2% increase in 2002 versus 2001. Pricing will be difficult in 2003 for paint manufacturers (except at company-owned stores that cater to contractors) and may lead to lower margins.

### **Industry Consolidation Continues**

Consolidation has been key to profitability for the past three decades, resulting in a 57% decline in the number of companies competing in the coatings sector. The number of plants has also been reduced by more than half (see Exhibit 15).

**Exhibit 15. Coatings Consolidations, 1970-2000**

	Number of Companies	% Change	Number of Plants	% Change
2000	600	-18%	800	-31%
1990	735	-29%	1,160	-20%
1980	1,040	-25%	1,445	-12%
1970	1,380	-13%	1,650	-8%

Source: The ChemQuest Group, Inc.; Bear, Stearns & Co. Inc.

[charts I.xls \(ex13\)](#)

The industry has been largely consolidated, with six companies now representing 90% of sales in certain segments. Akzo Nobel, Sherwin Williams, PPG, DuPont, and ICI are among the largest global players.

**Exhibit 16. Global Coatings Producers, 2000-02 (\$ in billions)**

Rank	Company	Sales		
		2000	2001	2002
1	Akzo Nobel	\$5.24	\$5.26	\$5.24
2	Sherwin Williams	5.20	5.06	5.18
3	PPG	4.66	4.41	4.48
4	DuPont <sup>(1)</sup>	4.00	3.60	3.65
5	ICI	3.44	3.57	3.43
6	BASF	2.07	2.13	2.18
7	Valspar	1.48	1.92	2.12
8	Nippon	1.60	1.61	1.60
9	RPM <sup>(2)</sup>	1.37	1.45	1.55
10	Sigma Kalon	1.47	1.45	1.52
11	Kansai	1.40	1.42	1.46
12	Masco	0.95	1.05	1.15
13	Benjamin Moore	0.78	0.79	0.83

(1) Estimate of DD's coatings sales excluding TiO<sub>2</sub>

(2) Coatings-only sales estimates.

Source: The ChemQuest Group, Inc.; Bear, Stearns & Co. Inc.

[charts I.xls \(ex14\)](#)

The world's top paint companies grew by an average 2.2% in 2002 versus 2001. U.S.-based companies experienced higher growth, of 4%, while foreign companies had essentially flat sales. Valspar, RPM, and Masco's Behr Process business unit experienced the highest growth, while ICI and Nippon were the laggards with negative growth.

### **Environmental Trends Driving OEM Market**

New technology in the OEM market is largely driven by a need to drive costs out of the value chain while maintaining a steady improvement in environmental performance. The majority of R&D spending is focused on waterborne acrylic technologies, which aim to 1) lower applied costs/productivity by reducing formula costs through optimization of raw materials, improved processes, etc.; and 2) compliance with the 1990 Clean Air Act being phased in over the next few years.

Some of the emerging technologies currently in use include:

- **Alternative Cure Technology.** UV, IR, and NIR that are opening the door for new substrates to be coatings (particularly wood and plastic).
- **PPG's CeramiClear Clear Coat.** Employs nano-particle technology that provides a durable, glossy appearance by creating a highly cross-linked network at the coating surface, resulting in superior resistance properties.
- **PPG's Environcron HT.** High-temperature powder coatings that offer superior durability in prolonged exposure to temperatures of up to 600°F. The powder coatings are formulated for applications such as automotive, appliance, and lawn and garden, where resistance to high temperature is crucial.
- **DuPont's SuperSolids Low VOC Automotive Coatings.** Offers significantly reduced VOC emission and enhanced scratch and mar resistance. Initial commercial application was on Dodge Durango trucks at a DaimlerChrysler assembly plant in Newark, Delaware.

#### ***Lead Paint Litigation Less of a Concern***

Lead paint litigation concerns have waned for the industry versus last year. An unsuccessful Rhode Island trial last year leaves intact legal precedent that no liability exists for paint manufacturers. We are in agreement with The ChemQuest Group that paint manufacturers are not likely to be held liable.

## **PAINTS AND COATINGS FORECAST**

### ***Tempered Growth of 2% in Volumes, 3% in Sales***

The ChemQuest Group forecasts moderately lower growth in 2003 of 2% in volumes and 3% in sales. Continued strength in the housing market is likely to be offset by the continued shift of OEM business to China, weak industrial manufacturing, and a poor aerospace market. Shipments have increased at a steady rate, but similar increases have not been seen in inventories. Moreover, the pre-buying volume surge in transportation is not likely to recur.

Industry leader Sherwin-Williams expects its 2003 sales to be between 2.0%-2.5% higher than 2002, a modest reduction to its estimate at the beginning of 2003. The year is off to a slower start due in part to a poor domestic industrial sector and harsh weather. Strong architectural paint sales are likely to be offset by continued weakness in the industrial maintenance and product finishes markets.

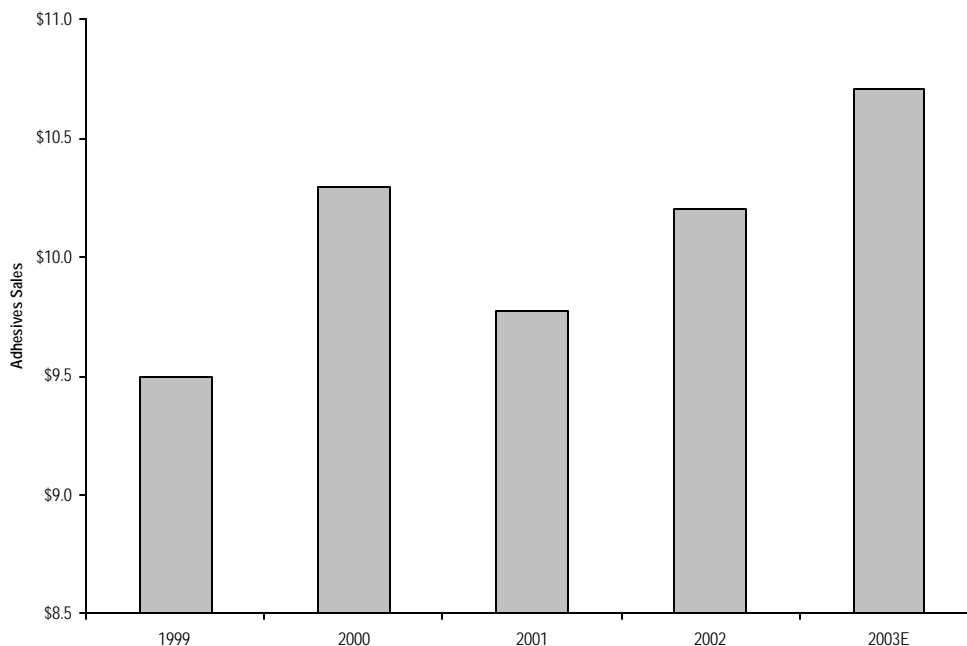
## U.S. Adhesives

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### ADHESIVES OVERVIEW

The \$10.4 billion adhesives industry grew sales by 4.2%, due to drivers similar to the coatings industry. Sales were up significantly in 2002, versus tough conditions experienced in 2001 (see Exhibit 17). Top-line gains were led by strength in pressure-sensitive adhesives and construction applications, which benefited from lower interest rates. Margins remained relatively stable through plant closings and cost reductions, and the ability to pass through some price increases to offset rising energy costs.

Exhibit 17. U.S. Adhesives Sales, 1999-2003E (\$ in billions)

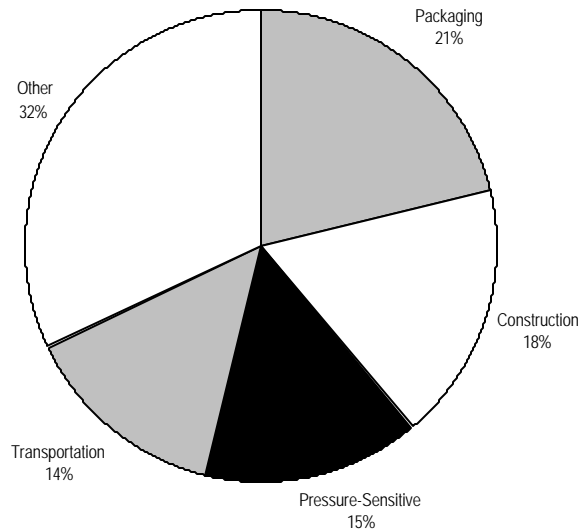


Source: The ChemQuest Group, Inc.; Bear, Stearns & Co. Inc.

[charts I.xls \(ex15\)](#)

The adhesives industry is more fragmented than the coatings industry, with many market sectors. Four of the larger market sectors — packaging, construction, pressure-sensitive, and transportation — account for over two-thirds of the overall market (see Exhibit 18).

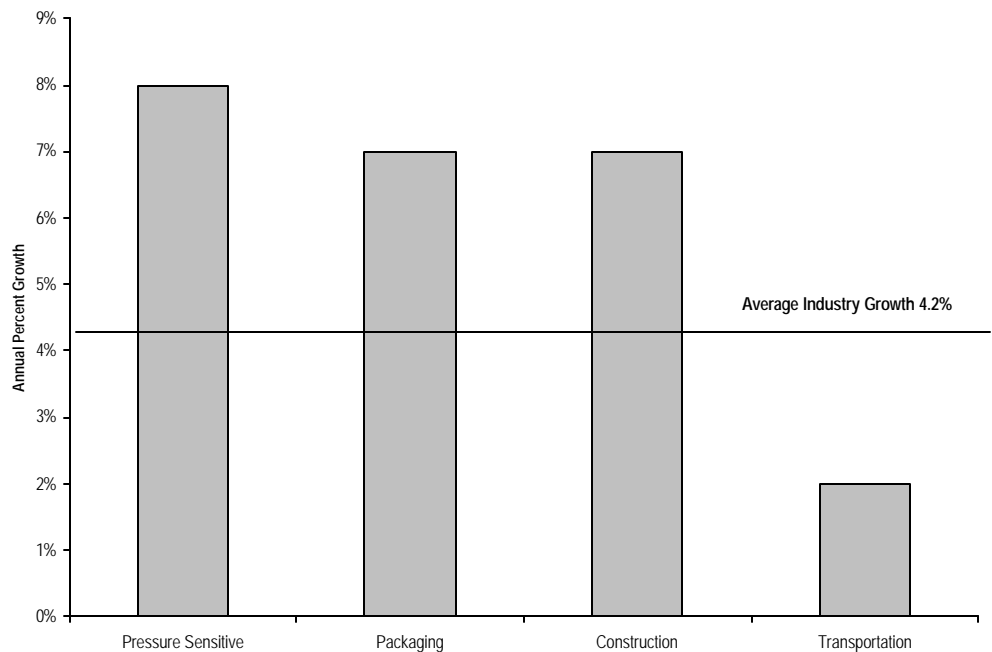
### Exhibit 18. U.S. Adhesives Major Market Sectors



Source: The ChemQuest Group, Inc.; Bear, Stearns & Co. Inc. [charts I.xls \(ex16\)](#)

Pressure-sensitive, packaging, and construction grew significantly above GDP levels. Pressure-sensitive (including duct tape) experienced the most growth from higher demand; however, transportation was pulled down by the declining airline industry (see Exhibit 19).

### Exhibit 19. Adhesives Sales Growth, 2002



Source: The ChemQuest Group, Inc.; Bear, Stearns & Co. Inc. [charts I.xls \(ex17\)](#)

The adhesives industry is also fragmented by the large number of adhesive manufacturers that supply products to it. The ChemQuest Group estimates the number of players to be around 600. An overview of the major suppliers and competitors is shown in Exhibit 20.

## Exhibit 20. Major U.S. Adhesive Suppliers and Competitors

Major Adhesive	Typical Market Segments		Competitors
<i>Construction</i>	Resilient Flooring	Joint Cements	Sovereign
	Ceramic Tile	Curtain Walls	H.B. Fuller
	Counter Tops	Wall Covering	RPM
	Manufactured Housing	Dry Wall Adhesives	Sika
	Fabricated Beams & Trusses	Roofing Adhesives	Mapei
	Carpet Layment	HVAC	SKW
	Under Layment	Concrete	
	Panel Adhesives		
<i>Transportation</i>	Auto Exterior Trim	Railroad	Eftec
	Auto Interior Trim	Aircraft/Aerospace	Henkel
	Auto Assembly	Marine	Ashland
			Bostik Findley
			Lord 3M Rohm and Haas
<i>Packaging</i>	Corrugated	Envelopes	National Starch
	Cartons	Remoistenables	HB Fuller
	Disposables	Film/Film Laminations	Henkel
	Bags	Specialty Packaging	Forbo
	Labels/Signs/Decals	Composite Containers	Bostik Findley
	Cups	Other Flexible Packaging	
	Cigarettes		
<i>Pressure-Sensitive</i>	Packaging Tapes	Masking Tapes	3M
	Electrical Tapes	Consumer Tapes	Avery-Dennison
	Industrial Tapes	Labels	Ashland
	Surgical/Medical Tapes		Air Products
			UCB National Starch Bostik Findley HB Fuller Rohm and Haas

Source: The ChemQuest Group, Inc.; Bear, Stearns & Co. Inc.

[charts I.xls \(ex18\)](#)

### **Consolidation Likely to Continue in Order to Maximize Profitability**

Consolidation in the adhesives industry trails the coatings industry by ten to 15 years, leaving a more fragmented market. The top eight adhesives players account for less than 50% of the U.S. market demand.

## Exhibit 21. Major U.S. Adhesives Players

Over \$1 Billion	Below \$1 Billion
Bostik Findley	3M Company
HB Fuller	Adco Global
Henkel	Ashland
National Starch	Avery Dennison
	Borden
	Franklin International
	Illinois Tool Works
	Rohm and Haas
	Forbo (Swift)
	Sovereign Specialty Chemical

Source: The ChemQuest Group, Inc.; Bear, Stearns & Co. Inc.

[charts I.xls \(ex19\)](#)

Despite significantly lower acquisition activity in 2001 and 2002 due to the recession and availability of funds, we expect consolidation to continue in the near future in order to maximize profitability.

Similar to the coatings industry, adhesive industry margins are being squeezed by both big box retailers and raw material suppliers. Many players have utilized merger synergies as an effective means of maintaining reasonable margins through low-cost positioning.

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**ADHESIVES FORECAST*****Sales Growth of 5%***

Adhesives sales are expected to grow by 5%, driven primarily by replacement of mechanical fasteners, especially solventless reactive systems and the continued high growth of pressure-sensitive adhesives. Margins should improve as price increases continue to be implemented, offsetting rising feedstock and energy costs. Bostik Findley, H.B. Fuller, and Rohm and Haas are among the companies that have announced price increases, ranging from 3% to 12% so far this year.

The ChemQuest Group Inc. is a management consulting firm headquartered in Cincinnati, Ohio, with offices in Boston, Massachusetts; Wilmington, Delaware; Chicago, Illinois; Columbus, Ohio; and London. It specializes in the global paints, coatings, adhesives, and sealants industries. An important component of its consultancy is providing advice and guidance for growth through acquisitions in these industries. The company can be reached at 513-469-7555 or at [www.chemquest.com](http://www.chemquest.com).

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