

STATE OF THE COATINGS INDUSTRY

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In the face of a recessionary economy and the events of September 11, the final outcome was not as bad as initially anticipated. 2001 Paint and Coatings industry shipments declined 4.4% to an annual rate of 1.23Bn gallons, while the value of shipments was \$16.2Bn, a decline of 0.2% (Figure 1), which reflects industry attempts to boost prices in response to raw material escalation.

Figure 1

U.S. Paint & Coating Shipments (2001 vs. 2000)

	Quantity (MM gallons)	Value (\$MM)
2001	1,226,772	16,176,261 \$13.18/gal
2000	1,280,522	16,203,311 \$12.65/gal
	-4.4%	-0.2%

The performance of the U.S. Coatings Industry seems to be a microcosm of the economic performance reports mirroring the “Tale of Two Tapes” between consumer spending and industrial production of the manufacturing sector.

Consumer spending typically impacts Architectural Coatings manifested in the form of housing starts and residential remodeling.

The housing sector is typically among the hardest hit during a recession, as banks tighten credit and consumers hold back on big-ticket items. Yet that hasn’t played out so far during this economic cycle. Exceptionally warm winter weather, low inflation and mortgage rates hovering near 30-year lows contributed to 3% growth in new home construction finishing at a pace of 1,273 million units. Furthermore, average home sizes grew for the sixth consecutive year to 2273 ft², a 2% increase from 2000.

If unemployment had a role in dampening new home construction, it is not evident; however, according to the National Association of Homebuilders’ latest Remodeling Market Index (RMI), rising unemployment, and September 11,



played a key role in flattening activity the second half of the year. The last two quarters registered current market RMI of 45, while future market conditions registered a 42.8 rating. Any index below 50 indicates that more remodelers view market conditions as unfavorable than favorable.

Architectural Coatings shipments declined by 1.0% but sales revenue increased by nearly 2.0% (Figure 2). It is likely that flattening of the remodeling sector prevented architectural shipments from finishing in the black. Sherwin Williams, ICI, Masco and Ben Moore represent 60% of the architectural market.

Figure 2

Comparison of Coating Shipments by Strategic Segment (2001 vs. 2000)

	Architectural Coatings		
	Quantity	Value	Avg. S.P.
	(000) gallons	(000)\$	\$/ gal
2001	638,363	6,530,454	\$10.23/gal
2000	645,648	6,419,863	\$9.94/gal
	-1.1%	1.7%	10.7%
	Product OEM Coatings		
	Quantity	Value	Avg. S.P.
	(000) gallons	(000)\$	\$/ gal
2001	431,673	5,970,038	\$13.83/gal
2000	453,222	6,149,220	\$13.56/gal
	-5.0%	-3.0%	2.0%
	Special-Purpose Coatings		
	Quantity	Value	Avg. S.P.
	(000) gallons	(000)\$	\$/ gal
2001	156,736	3,675,769	\$23.45/gal
2000	181,652	3,634,228	\$20.00/gal
	-15.9%	1.1%	17.3%

Representing the opposite end of the tape are industrial coatings, which are more typically aligned with manufacturing production. In business cycle history, this



recession may go down as one of the mildest; nonetheless, it was far more pronounced in manufacturing where industrial production declined for eighteen consecutive months. This phenomenon is none more evident than in the performance of Product OEM and Special-purpose coatings (Figure 2).

Product OEM coatings comprise factory-applied finishes such as coatings for transportation vehicles, appliances, furniture, machinery and equipment, etc. This sector recorded a 5% decline in shipments and a 3% decline in value in 2001. DuPont, PPG and Valspar dominate this market.

Without zero percent financing spurring automotive sales, it is highly likely that the decline in this sector may have reached in the double digits. Transportation finishes associated with aerospace, and heavy trucks were hardest hit. Boeing production slipped below a 400-unit level, down 33% from the highs established in 1999. Likewise, demand for heavy trucks, buses, mobile homes and conversion vehicles continue to face decade-low demands for new builds. Combined production rates reached approximately 1.3MM units, the lowest since 1993.

Special-purpose coatings are typically field applied. They comprise applications such as automotive refinishes, aerosol paints, traffic markings and corrosion protection coatings for industrial maintenance of facilities and infrastructure. Special-purpose coatings saw the farthest decline in volume- approximately 16% vs. 2000 shipments. Yet, it exceeded 2000 value by registering a 1% increase vs. 2000 sales.

As the largest and most profitable segment, auto refinishing continued its decades-long decline in volume at a rate of 1.0% annually, while revenue increased 2-3%. The auto-refinishing sector continues to face stiff challenges from a reduced collision rate brought about by improved vehicle safety standards & performance. Furthermore increasing accident management by the insurance industry and consolidation of collision repair shops and distributors has put new pressures on the manufacturers. This is market that is dominated by DuPont and PPG worldwide.

Public and private non-residential construction slowed considerably in 2001, impacted predominantly by curbing the appetite of capital expenditures for new facility construction and maintenance. One bright spot emerged in this segment in



the form of entertainment complexes. Venues built for the Winter Olympics, as well as the trend of constructing single-sport stadiums provided for healthy growth. These construction projects typically span over 2-5 years, with funds pre-approved and committed, hence sustaining growth through this anticipated short recession cycle.

Recovery of Growth

The collective reaction of the industry towards 2002 is “cautiously optimistic.” Economic activity in the manufacturing sector actually grew in February, for the first time in 18 months. While one month does not make a trend, we are hopeful it will signal the beginning of a recovery.

In consideration of recovery, there exist a complex set of factors that influence top line and cost:

Top Line Growth

An optimistic cord among all the bad news is the that *pricing growth* was 4% in 2001 with all the categories showing value outpacing volume, which is a strong indication of the industry raising prices to recover margins lost in 2000 as a result of rapid raw material increases. There is typically a six-month lag time in pass through economics, primarily due to contractual agreements.

Housing starts rose 6.3% in January exceeding expectations. Builders are starting new home construction at an annualized rate of 1.68MM units, the fastest pace since February.

Military spending has historically provided a windfall for the coatings industry. Continued involvement in the “War on Terrorism” as well as an increase in military will provide a significant boost in demand for Product OEM coatings. Coatings are utilized on many facets of military assets e.g. missiles, vehicles, aircraft, munitions, etc.).

Likewise, public and private spending for *rebuilding the structures* lost in 9/11 will boost demand for special-purpose maintenance coatings as well as architectural paints.



However, 2002 will continue to present challenges, particularly the continued *strength of the dollar*, which is hurting exports. Paint and coatings exports for the year 2001 were \$1.9Bn, a decline of 1%, while imports increased by 56% to \$373MM.

While the “War on Terrorism” has a positive influence in driving demand, it may have a significant downside should the U.S. attack Iraq resulting in escalation of oil and energy prices. A significant portion of raw materials for paint and coatings are derived from oil and chemical feedstocks.

The “*zero percent*” solution adopted by the auto industry to stimulate growth towards the end of 2001, may in fact succeed in robbing some spot light from the recovery in 2002 for Product OEM coatings. Forecasts for 2002 range from a low of 15.5 to 16.5 million builds for auto, light trucks and SUVs. Considering 2001 builds were in the range of 17.5MM units, the Coatings industry would decline approximately \$150-300 million in demand if initial forecasts were correct.

The *travel industry* woes will have a measurable impact on coatings. Airport facilities, hotels, airplane and train builds, all utilize coatings. Therefore, forecasted delays in capital projects, and cancellation and/ or postponement of new product deliveries will make recovery in 2002 rather subdued.

Needless to say, another terrorism incident within the borders of the U.S. will have severe consequences on recovery in 2002.

Cost

Companies have positioned themselves well by slashing fixed costs, reducing personnel and pulling the reigns on capital expenditures. As well, *Inventories* are at record low levels. So restocking cycles will likely stimulate manufacturing activity once the starter’s gun goes off and companies begin focussing on future growth.

Raw material prices have come down considerably since 2000 as a result of the drop in oil prices. Coupled with industry success in pass through price increases it should result in attractive margins by mid year. Additionally, because of the significant monetary and fiscal stimulus under way, coupled with reduced fixed costs, will result in a much higher return on capital in the next couple of years. Oil



prices are beginning to creep up and we anticipate there will be pressure on raw material prices later this year.

Raw material suppliers comprised of petrochemical feed stocks, monomers, and pigments (e.g. TiO₂) will likely pressure the industry in raising prices to recover margins lost due to the slow down of top line growth. However, that will be exceedingly difficult to do in this year. In our opinion, capacity utilization is too low to sustain any price increase pressures. Deep cyclicals like ethylene and propylene (Lyondell, Millenium, and Shell) along with their respective downstream intermediate monomers such as butyl acrylate and methyl methacrylate (Dow, Celanese, BASF, RandH, Total, Ineos, etc.) are stuck with oversupply positions as capacity utilization dipped to 70% levels. TiO₂ (DuPont, Millenium, Kerr McGee) presents another challenge as producers have announced price increases of about 5% in February. Similarly, while industry volumes were up in January and Architectural Coatings held up well through the downturn, operating rates dipped to about 70% as well.

Overall, we expect the first six months to register modest gains in the range of 1.5-2.0%, followed by robust growth, in the range of 3.0-4.0% in the second half of the year.

Overall Trends and Drivers

General Trends and Drivers

Mature Growth- the Coatings industry has been growing at GDP for the past two decades. The primary drivers relate to surfaces to be painted such as wood, metal, plastic, concrete and masonry. Fundamentally, there are no new surfaces being created, in fact, new developments constantly eliminate surfaces such as vinyl siding & cladding, and decorative decals.

Increased Competitive Pressure- while mature, the coatings industry still comprises nearly 700 firms, which creates over capacity and extreme pressures on maintaining pricing and market shares. Correspondingly, raw materials represent 50-65% of paint cost. Hence, cyclical chemical pricing pressures create a significant margin squeeze. Therefore, participants (suppliers as well as paint producers) are focusing technology developments on wringing value from the value chain through bold initiatives aimed at process efficiency.



Government Regulations- continue to be a large driver for new technology development, capital cost and R&D expenditures. The industry is under consistent pressure to reduce emissions of Volatile Air Compounds (VOCs) and Hazardous Air Pollutants (HAPS) to comply with clean air guidelines in North America and in Europe.

Globalization- the top ten coatings companies in the world control over 50% of the global market. Similarly, many traditional national companies are expanding their international presence following their customer base as they develop global specifications and expand operations. In the process, coating companies are forcing their suppliers to follow suit as they standardize formulas and reduce suppliers.

Consolidation- since the mid-seventies, the coatings industry consolidated by approximately 65%. However, hundreds of small and medium size private firms continue to operate on local and regional levels. The market dynamics stated above will cause further consolidation as business economics dictate more rigorous management.

Market Directions

Architectural Coatings

1. *Channels of Distribution-* shifts amongst the three primary channels of distribution (Stores 49%, Dealers 30%, Mass Merchants 21%) continue to favor mass merchants (Home Depot, Lowe's, Wal-Mart, K-Mart, Sears, etc.), which the fastest growing channels, over Dealers and company-owned stores.

The ascent and popularity of "Big Box" stores has been the cause of a considerable loss of leverage by coatings companies. In exchange for market share, Big Boxes have been successful in de-bundling the value propositions of suppliers, in turn, levying significant pressure on working capital, brand identity, pricing and most importantly margins. More recently, Home Depot exhibited the ultimate in de-bundling by holding a reverse auction for their demand in colorants, which it awarded to Engelhard. ICI has a strong position with Home Depot; Valspar has a strong position with Wal-Mart and splits the business at Lowes with PPG.



2. *Lead Paint Litigation*- since 1989, 40-50 lawsuits have been resolved with the paint industry having never settled a single case. We continue to believe that the case against manufacturers lacks merit, although precedence exists of cases where building owners/ landlords have been found liable.

The biggest development to date relates to a Rhode Island lawsuit filed by the State Attorney General. On February 28th, Rhode Island Superior Court Judge Michael Silverstein ruled that the state's attorney general could proceed with a lawsuit against former suppliers of lead-based paint and lead pigments (e.g. SCM- acquired by Millenium, Cytec- American Cyanamid- acquired by Cytec Industries, Atlantic Richfield- acquired by BP, DuPont, NL Industries, Sherwin Williams). But Silverstein said the state's case must be restricted to whether old lead-based paints constitute a public nuisance. Silverstein, last year dismissed the product-liability claims in the Rhode Island suit, narrowing the scope of the suit.

While most of the lawsuits to date have been dismissed, similar suits have been filed on behalf of Newark, NJ, Milwaukee, WI, New York City and St. Louis. The NAACP has also threatened to sue. The compilation of all these activities is expanded media coverage, although it has yet to reach a frenzied state.

In bringing these suits, the plaintiffs - both private individuals and government officials—distort the facts and attempt to use novel legal theories to assign blame to the companies. The government plaintiffs also have begun partnering with well-known plaintiff attorneys to secure additional resources to wage their suits and file similar suits in other jurisdictions.

Attempts are being made to draw analogies between asbestos litigation and lead paint litigation. There is one major difference in our opinion:

- a) The basic cause of lead poisoning is poor maintenance of lead paint in housing leading to flakes of paint being spread through the immediate environment – a responsibility of owners and landlords. The paint companies long ago recognized this fact and have been actively educating the public on how to properly maintain housing coated with lead-paint. In fact, substantial technology has been developed and is routinely used in the



industrial coatings market (bridges, refineries) to maintain facilities with lead-paint so as to prevent accidental poisoning.

Despite these tactics, the plaintiffs cannot overcome the basic truth: the former manufacturers of lead pigment have a long record of corporate responsibility. As these companies learned about the evolving concerns of lead paint, they took steps to protect their workers, painters and the public at large.

- a) They sponsored and funded no-strings-attached research on lead toxicity at Harvard and Johns Hopkins Universities in the 1940s and 1950s.
- b) They encouraged public health departments to investigate lead poisoning in their communities.
- c) They disseminated information on lead hazards to pediatricians and public health authorities.
- d) And in 1955, they voluntarily adopted a national standard aimed at removing lead from paint used in people's homes; this was more than 20 years before the U.S. Congress banned lead paint in 1978.

Despite our belief that cases will be thrown out, we acknowledge the expense incurred in legal and opportunity costs associated with mounting a credible defense.

Product OEM

1. *Technology influences-*

- a) Conversion from liquid coatings to powder coatings will continue to prevail, although growth is slowing to a 5-7% annual rate. Powder continues to emerge as a viable threat to liquids in wood and other temperature sensitive substrates.
- b) Pre-coated coil substrate provides significant advantages e.g. speed, efficiency, and cost, but induction time into automotive will be long. This is one of the fastest growing segments in the industry exhibiting 7-9% compounded annual growth rates.
- c) UV cured powder is the next paradigm.

2. *Total cost management-* OEM's are increasing asking coating companies to manage the entire painting process, with compensation tied to per unit of production.



3. *Wood Imports*- the importation of wood furniture and composite materials signifies a continued threat to North American coating companies. Wood and composition flat stock has exhibited high growth rate (~5.0 % per annum) with the decline of forestation in the region.
4. *Machinery & Equipment Exports*- Global economies heavily influence our machinery and equipment manufacturers who are highly global.
5. *Plastic Containers and Flexible Packaging*- pose a significant threat to traditional metal containers that are liquid coated.

Special-purpose Coatings

1. *Technology influences*- Industrial New Construction and Maintenance Coatings
 - a) *One and two component waterborne acrylic and urethane reactive cure systems*- will sustain moderate growth against solvent coatings. Solvent and high solids systems dominate with 85-90% share of this segment. Government regulations will continue to favor the switch to alternative technologies albeit evolving at a relatively slow induction time.
2. *Public & private spending*- Industrial maintenance coatings are directly influenced by industrial construction where large assets require corrosion protection and/ or aesthetic appeal, e.g. infrastructure, entertainment complexes, municipal projects, chemical and oil processing, etc.
3. *Automobile accident rate*- continues to decrease despite an increase in vehicle mileage and registered users due to improvements in safety devices and traffic safety. Additionally, the insurance industry is increasingly controlling the accident management process. This has a direct influence on automotive refinish coatings, which not surprisingly have been declining in volume, but maintaining a flat to slight growth in revenue.



Top Ten

Top 14 actually in order to include some notable U.S. firms for your consideration:

<i>Rank (00)</i>	<i>Company</i>	<i>Sales (\$Bn) 2000</i>	<i>Rank (01)</i>	<i>Company</i>	<i>Sales (\$Bn) 2001</i>	<i>% Var</i>
1	Akzo Nobel	5.24	1	Akzo Nobel	5.26	0.4%
2	Sherwin Williams	5.20	2	Sherwin Williams	5.06	-2.7%
3	PPG	4.66	3	PPG	4.41	-5.3%
4	DuPont	4.00	4	DuPont*	3.60	-10.0% E
5	ICI	3.44	5	ICI	3.57	3.8%
6	BASF	2.07	6	BASF	2.13	2.9%
7	Nippon	1.60	7	Valspar	1.92	29.7%
8	Valspar	1.48	8	Nippon	1.61	0.6%
9	Sigma Kalon	1.47	9	Sigma Kalon	1.45	-1.4%
10	Kansai	1.40	10	Kansai	1.42	1.4% E
11	RPM	1.04	11	RPM**	1.10	5.8% E
12	Masco	0.95	12	Masco	1.05	10.5% E
13	Ferro	0.81	13	Ferro**	0.92	13.6% E
14	Benjamin Moore	0.78	14	Benjamin Moore	0.79	1.3% E

*Estimate of DuPont's coatings sales excluding TiO2

** Coatings only sales estimates

One notable movement is Valspar's ascent into the global number seven ranking.

It is evident from this ranking that companies such as DuPont & PPG, who have a high concentration of business in automotive suffered the most in this economic down cycle. In contrast, highly diversified companies, particularly ones with consumer offerings, were able to mitigate some of the slow down. Companies exposed to the auto industry also experienced the steepest drop in earnings.



Product Portfolios and Strategy

To a large degree, the profitability of the paint companies is dictated by the markets that they serve. Generally speaking, The most profitable market is the Specialty market followed by OEM and then Architectural. We believe that strategies of the major paint companies will continue to be driven by positioning among the market segments to optimize their profitability. Note that DuPont and PPG are the top producers of Specialty and OEM coatings, but while PPG has a relatively lower ranking in architectural segments, DuPont has no position at all. Conversely, Akzo has built its world leading position with a balanced participation in all three segments.

Worldwide Share Position by Segment

Architectural	OEM	Specialty
SW	DuPont	PPG
ICI	PPG	DuPont
Akzo	Akzo	Akzo
Valspar	BASF	RPM
PPG	Valspar	BASF

Among these top players, strategic moves such as acquisitions will be hampered by their strong market share positions.

Akzo – As the world leader, we expect Akzo to maintain a balanced portfolio across all segments and to focus on growth in emerging markets. Evidence of this is Akzo’s investments in Southeast Asia.

Sherwin Williams – Sherwin Williams has developed a powerful business model that exploits their strong distribution in North America focused on the architectural market. However, this model has been under attack as new channels have emerged through the “big boxes”. Strategically we expect SW to focus their efforts in shoring up their North American position in architectural and attempting growth internationally by exporting their expertise in distribution.



PPG – PPG will focus on organic growth in OEM and Specialty in both North America and Europe, but will continue to focus acquisitions on growing their modest position in Architectural in North America. These acquisitions have been small the last few years, but could be significant as the recovery continues. PPG like DuPont is somewhat constrained from making major acquisitions in automotive, but could make modest acquisitions in OEM.

DuPont – We expect DuPont to grow organically in those markets they currently participate – mostly OEM. Furthermore, as DuPont reinvents itself and spins off the textile fibers businesses, the Performance Coatings and Colors business will probably receive more attention as a core business, especially in the near-term. The combined power of a downstream position in coatings and an upstream position in TiO₂ could bring additional synergies to the bottom line. These two businesses have traditionally not worked closely and bringing them together should improve combined bottom line.

ICI – We expect ICI to leverage its strong worldwide position in Architectural by increasing focus on the strong position at Home Depot and support Home Depot's efforts to grow internationally. Furthermore, ICI has increasingly invested in the Specialty market using coatings for industrial maintenance.



Financial Performance

Not too surprisingly, sales and earnings reports from major coating companies for the fourth quarter and full year 2001 showed the effects of the economic weakness in world markets. Industry giant Akzo, Sherwin Williams, PPG and DuPont all reported earning declines in 2001.

Company	Net Income (\$MM) 2001	Net Income (\$MM) 2000	% Var
Akzo Nobel	383	403	-5%
Sherwin Williams	263	309	-15%
PPG	495	685	-28%
DuPont (1)	319	674	-53%
Valspar (2)	74	89.2	-17%
RPM (3) Fiscal May 31	63	41	54%
Ferro (3)	39	73.2	-46%
Eastman (4)	53	132	-60%
Rohm & Haas (5)	85	282	-70%
Dow (6)	1254	1565	-20%

(1) Includes TiO₂

(2) Excludes pre-tax charge of \$39.3MM

(3) Full company performance

(4) CASPI performance only (Coatings, Adhesives, Specialty Polymers and Inks)

(5) Performance Polymers only

(6) Combined Performance Chemicals and Performance Plastics

Akzo Nobel reported flat sales of \$5.26 Bn compared to 2000 and operating income before nonrecurring items of \$383 MM, a decline of 5%.

Sherwin Williams reported fourth quarter and full year declines in net income. Fourth quarter 2001 net income declined 1.6% to a level of \$45.4MM versus fourth quarter of 2000. For the full year 2001, net income was \$263.2MM a decline of 15% from 2000. Sales for the year fell 2.8% to \$5.06Bn.

PPG Industries reported fourth quarter net income of \$136MM, a decline of 8.7% from the fourth quarter of 2000 on sales declines of 3.5% to \$1.07Bn. For the full



year 2001, sales declined 5.3%, to \$4.41 Bn, while operating income was \$495MM, down 27.7% from 2000.

DuPont reported fourth quarter 2001 net income for its Performance Coatings and Polymers segment of \$95MM, a 51.5% decline from the prior year period. Sales for the quarter fell 9.3% to \$1.4 Bn. For all of 2001, net income was \$319 MM, a decline of 52.7%. Sales for the year fell 11.3%, to \$5.75 Bn. (note: DuPont combined its TiO₂ operating unit with its Performance Coatings Division. Therefore our sales estimates exclude TiO₂, but earnings reports are for the entire business unit)

Valspar reported net income for the fiscal year 2001 before non-recurring charges was \$73.7MM, a decline of 17.4% compared to previous fiscal year. Sales for the year increased 30% to \$1.9Bn compared to \$1.4Bn last year. Valspar recorded a \$39.3 million pre-tax charge to earnings for the fiscal 2001 fourth quarter to eliminate redundant facilities resulting from the Lilly Industries acquisition and to accelerate performance improvement. Including this charge, the fourth quarter reported net income was \$2.5MM. For the full year, reported net income was \$51.5MM.

RPM's fiscal 2001 ended May 31, 2001. The Company reported a 2.3% in net sales. 2001 net income of \$63 million, compares favorably with \$41 million in 2000, a 54% increase.

Ferro reported fourth quarter net income of \$6.0MM, a decline of 63.4% from the fourth quarter of 2000. Sales for the quarter rose 11.9%, to a record \$409.9MM. For the entire year, Ferro recorded record sales of \$1.5Bn a growth of 3.3%. However, net income was \$39.2MM, a 46.4% decline from 2000.

Eastman Chemical reported overall sales increase of 1.7% on sales of \$5.38 Bn with increased revenue from acquisitions covering a drop in sales volume for continuing businesses. For the full year Eastman reported an operating loss of \$126 MM including one time restructuring charges of \$396 MM. Operating earnings for the CASPI group were \$53 million in 2001, down from \$132 million in 2000, as a result of weaker demand in all segments, lower prices in the performance chemicals and intermediates segment and overall lower capacity utilization.



Rohm and Haas reported full-year 2001 sales of \$5.7 billion, a decline of 11 percent from the \$6.3 billion reported for 2000. Full-year 2001 net earnings from continuing operations, excluding non-recurring items, were \$189 million, down 42 percent from the full-year 2000 figure of \$324 million. Performance Polymers full year sales were \$3.2 billion, a decline of 6%, while earnings were down 70% to \$85 million.

Dow's full year results netted a 6% decline in sales to \$27.8 billion and an EBIT of \$1.3 billion excluding unusual items, a 57% decline from 2000. For the year, Performance Chemicals reported net sales of \$5.1 billion, a 5% decline. EBIT for Performance Chemicals increase 14% to \$611 million. Performance Plastics sales decreased 5% to \$7.3 billion, with EBIT decreasing by 39% to \$1.0 billion

There are increasing signs that the recession is easing its grip. We are optimistic about the upturn in manufacturing activity. It is our belief that 2002 will experience a rebound in lost profitability, albeit not likely to recover to 2000 levels.

Cost cutting was a resounding mantra in 2001 and year to date 2002, as paint manufacturers undertook significant cost cutting to reduce fixed costs (reduce staffing, consolidate facilities, delay or eliminate capital expenditures, and lower inventories). Meanwhile, the economic stimulus from the Fed through eleven consecutive interest rate cuts, coupled with moderating raw material costs provides the basis for noteworthy margin improvements in 2002.

Top line growth is expected in some sectors, notably construction (housing-which began the year with a return to record starts at 1.6 million annualized rate, and commercial building). The upturn in the manufacturing index is a welcome relief to OEM coating manufacturers, however, the Achilles heal remains the extent which automotive companies stole demand from 2002 by offering aggressive zero percent financing at the end of 2001.

While the first six months of 2002 will show modest recovery, estimated at 1-2% by most paint manufacturers, the latter half of the year brings promise of stronger gains, perhaps as 3-4%.



The Future of Technology

There are three themes driving coatings technology:

- Environmental & Societal
- Performance enhancements
- Improvements in the efficiency of the value chain

BASF and PPG seem to be the most prolific in new technical developments in 2001. Significant developments were announced in automotive, coil, and pigment processing.

Environmental & Societal:

Energy conservation and public safety emerged as key technologies in 2001.

Coil Roofing: this is a relatively new application to use coated coil metal roofing as replacement for asphalt shingles. Coil roofing represents a new surface application with market potential approaching \$1.0Bn.

- A. BASF Corporation's Industrial Coatings Regional Business Unit introduced a new, premium cool coating for metal substrates. ULTRA-Cool™ coatings dramatically increase the reflectivity of medium to darker colors, thereby reducing heat levels on vital applications like metal roofing. Excessive heat absorption of roofing materials and surfaces are a concern since more energy would be required to keep interior spaces cool and comfortable. Roofing materials that absorb heat are also a chief culprit in the "Urban Heat Island" effect, a phenomenon that causes the air over urban areas to be significantly hotter than surrounding suburbs. This effect, along with increased demands on power plants to supply energy for cooling, has led to notable increases in smog levels. Technology to achieve a "cool roof" effect enables a reduction in air temperature and energy consumption and the accompanying costs.
- B. Akzo Nobel Nippon Paint has developed a reflective paint for coil coatings, which acts as a heat shield to reduce the temperature of coil, even in dark colors.



- C. BASF announced the introduction of the experimental “Constellation Colors” for automotive coatings, which the company says use various technical approaches to make colors on vehicles visible at night. The colors offer aesthetic and safety appeal.

Performance Enhancements:

We would like to single out PPG for two key inventions in this arena:

- A. PPG Industries Inc. developed a “breakthrough” advance in powder-coatings technology that is reported to offer significant improvements in mar and scratch resistance in a range of finishing applications. The new ENVIROCRON XMR powder coatings “have approached the mar performance usually associated with porcelain enamels, as measured by commonly used industry tests.”
- B. PPG Industries won the prestigious PACE Award for its environmentally friendly FrameCoat electrodeposition coatings for automotive and light-truck chassis components. This marked the third consecutive year PPG has been a winner in the PACE Awards program, sponsored by Automotive News magazine and Cap Gemini Ernst & Young to honor automotive suppliers around the world for product innovation and management excellence. PPG is the only coatings manufacturer to receive three awards since the program began in 1994. Traditionally, the chassis components of cars and light trucks were coated with hot wax, providing corrosion protection for one to three years. FrameCoat coatings by PPG meet original equipment manufacturers' requirements for 10-year corrosion protection. PPG's award-winning product is used on DaimlerChrysler's Mercedes M-Class sport utility vehicles; Ford's Expedition, Super Crew, Explorer and Sports Trac models; and General Motors' Trail Blazer.
- C. A threat to the coatings business is innovation at GE Plastics, a business of General Electric Company which introduced automobile stylists and engineers to six new Visualfx™ molded through plastic resins. The new resins are formulated with the color and effect inherent in the pellet to create colorful and exceptionally rich looking parts out of the mold eliminating the need for what can often be costly secondary paint and coating operations.



Improvements in the Efficiency of the Value Chain:

Perhaps the most significant category liberating significant pent-up value:

- A. BASF also won a PACE award, sponsored by Automotive News magazine and Cap Gemini Ernst & Young, for innovation of its Integrated Coating Process, developed in cooperation with Daimler Chrysler and Dürr for the Mercedes-Benz A Class model at Rastatt, Germany. The system consists of heavy metal-free dip coat, two waterborne basecoat layers, the first of which acts as primer-surfacer, followed by a powder slurry clearcoat. As all three coats are applied wet-on-wet, one energy demanding step is eliminated.
- B. DuPont Co. unveiled a white-pearl automotive coating system that allows the finish to be applied in three layers without an intermediate bake step. A Volvo S80 finished with the waterborne coating system was recently displayed at the 2002 North American International Auto Show in Detroit. Traditionally, white-pearl waterborne coating system of the type introduced by DuPont requires an intermediate bake of the initial white ground coat. The pearl layer then would be applied in a wet-on-wet process with the clearcoat. The DuPont “tri-coat” system allows a wet-on-wet-on-wet process, with all three layers applied in a single pass through the spray booth. White pearl tri-coats consistently rank among the top three colors chosen by consumers of luxury cars in North America.
- C. *Pigment Processing*: the second largest cost component to paint manufacturers involves processing the pigment dispersion. This step is highly capital intensive and requires on average of 18hrs. (range 6-50 hrs) processing time.
- BASF has developed stir-in pigments for the coatings industry, launched under the trade name *Xfast*. Stir-in pigments make the production of aqueous decorative and industrial paints and coatings as well as aqueous printing inks much easier. Unlike traditional pigments, stir-in pigments do not require laborious processing before being incorporated into a paint or binder. Instead of the usual milling, pigment granules are stirred in, and the pigments develop their full tinctorial strength immediately.



About The Author



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Dan joined The ChemQuest Group, Inc. in 1996 from the Rohm & Haas Company where he was most recently European Director, Industrial Coatings. Prior to R&H, he spent thirteen years with Unocal Polymers where his career took him from technical service positions to Director of Marketing. He directed the sale of the Unocal Polymers Business to Rohm & Haas, working closely with Morgan Stanley, numerous attorneys, as well as the FTC. His entire career has been dedicated to the Coatings and Adhesives Industries. His particular strengths lie in strategic assessment and value creation on behalf of clients. He holds degrees from Wabash College (BS Chemistry) and William & Mary (MBA).

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