



Appliance Manufacturer

2001 Market Trends Study Overview & Comparison to 1994, 1996 and 1998 Results

The **AM Market Trends Study** is conducted periodically to identify trends and usage patterns of materials and components, as well as to define issues of importance to industry professionals. The 1994 study consisted of two 600-name samples that generated a total of 420 returns (36%); the 1996, 1998 and 2001 studies consisted of three 500-name samples. The 1996 study generated a 31% return; 1998 generated a 26% return and the 2001 study generated a 17% return. General questions were asked on all questionnaires. The individual samples were broken down by specifying/buying influence for the components, materials and equipment included.

Of course, not all questions are identical from study to study because of the trends and changes that take place over time. For example, the "CE" Mark was not included in the 1994 study, but is included in the 1996 study. "Downsizing/rightsizing and regulatory issues appear for the first time in 1998. Corporate Profitability appears for the first time in 2001.

| <u>Top 10 Issues Based on Mean Ranges</u> | <u>2001 Mean</u> | <u>1998 Mean</u> | <u>1996 Mean</u> | <u>1994 Mean</u> | |
|--|------------------|------------------|------------------|------------------|-------------|
| Quality | 4.3 | 4.4 | 4.6 | 4.6 | |
| Corporate Profitability | 4.2 | N/A | N/A | N/A | |
| Competing in a Global Marketplace | 4.0 | 4.0 | 3.9 | 4.1 | |
| Time to Market | 3.9 | 4.0 | 4.2 | 4.1 | |
| Product Liability | 3.8 | 3.9 | 3.9 | | |
| Supplier Partnerships | 3.4 | 3.5 | 3.6 | 3.3 | |
| Parts Reduction | 3.3 | 3.6 | 3.7 | 3.7 | |
| Regulatory Issues | 3.3 | 3.6 | N/A | N/A | |
| Energy Efficiency | 3.2 | 3.4 | 3.4 | 3.5 | |
| International Standards | 3.2 | 3.7 | 3.8 | 3.8 | |
| Noise/Quiet Design | 3.2 | 3.6 | 3.5 | 3.4 | |
| | | <u>2001</u> | <u>1998</u> | <u>1996</u> | <u>1994</u> |
| Expect capital equipment investments to increase over prior year over prior year | | 32% | 49% | 50% | 49% |
| Primary reason for capital equipment investments to be made: | | | | | |
| Expand capacity | | 26% | 34% | N/A | N/A |
| Produce new product platform | | 26% | 21% | N/A | N/A |
| Improve product and quality | | 24% | 24% | 54% | 57% |
| Companies that have vendor certification programs | | 57% | 61% | 63% | 64% |
| Will expect suppliers to: | | | | | |
| Price reductions | | 78% | N/A | N/A | N/A |
| Have JIT delivery programs | | 52% | 64% | N/A | N/A |
| Obtain ISO certification | | 45% | 41% | 45% | 41% |
| E-Commerce capabilities | | 41% | N/A | N/A | N/A |
| Participate as member of a cross-functional team | | 37% | 47% | 38% | 36% |
| Perform more design functions | | 36% | 29% | 43% | 32% |
| Types of outside services used: | | | | | |
| Testing, verification, certification | | 64% | 56% | N/A | N/A |
| Software consultants | | 32% | 37% | 62% | 65% |
| Industrial designers | | 23% | 26% | 48% | 35% |
| Product development consultants | | 19% | 23% | 43% | 34% |
| Manufacturing operations consultants | | 17% | 18% | 28% | 30% |

| | <u>2001</u> | <u>1998</u> | <u>1996</u> | <u>1994</u> |
|---|-------------|-------------|-------------|-------------|
| Have achieved ISO 9000 certification | 49% | 47% | 29% | 14% |
| Have achieved ISO 14000 certification | 8% | 3% | N/A | N/A |
| Use team approach in specifying/purchasing process | 78% | 71% | 77% | 78% |
| Respondents involved in the following spec/purchase teams | | | | |
| Components | 61% | N/A | N/A | N/A |
| Materials | 59% | N/A | N/A | N/A |
| Capital Equipment | 57% | N/A | N/A | N/A |
| Services | 33% | N/A | N/A | N/A |
| Country of respondents company headquarters: | | | | |
| United States | 96% | 93% | N/A | N/A |
| 2001 Global Highlights | | | | |
| 24% export to between 6 and 10 countries | | | | |
| 39% have manufacturing operations in one other country | | | | |
| 43% have no joint ventures | | | | |
| Canada, United Kingdom, Mexico, Germany and Japan are the top export markets | | | | |
| China, Canada, Mexico, Japan and United Kingdom are the markets expected to show greatest growth over next 3 yrs. | | | | |
| | | | | |
| Control components most often used: | | | | |
| Sensors | 75% | 77% | 73% | 72% |
| Microcontrollers | 55% | 66% | 60% | N/A |
| Control type - Electronic | 79% | 83% | 82% | 87% |
| Electromechanical | 63% | 54% | 66% | 76% |
| Control use/type will increase: | | | | |
| Electronic | 57% | 58% | 65% | 57% |
| Digital Implementation | 49% | 52% | N/A | N/A |
| Sensors | 45% | 48% | 58% | 49% |
| Microcontrollers | 35% | 44% | 55% | N/A |
| Motor use: | | | | |
| AC Motors | 83% | 79% | 84% | 90% |
| DC Brush | 48% | 32% | 31% | 37% |
| DC Brushless | 46% | 45% | 39% | 39% |
| Motor use will increase: | | | | |
| DC Brushless | 32% | 25% | 25% | 18% |
| AC Motors | 24% | 19% | 27% | 25% |
| Working with motor suppliers on: | | | | |
| Variable speed contro | 63% | 32% | N/A | N/A |
| Electronic commutation | 57% | N/A | N/A | N/A |
| Complete subassembly packages | 30% | 25% | 41% | 23% |
| Types of switches/relays most often used: | | | | |
| PC board relays | 61% | N/A | N/A | N/A |
| Indicating/illuminating | 57% | 40% | 58% | 58% |
| Relays 10amp & under | 56% | N/A | N/A | N/A |
| Pushbutton | 54% | 56% | 66% | 68% |
| Rocker | 49% | 51% | 51% | 60% |
| Solid state | 44% | 37% | 49% | 40% |
| Switch type use will increase: | | | | |
| PC board relays | 35% | N/A | N/A | N/A |
| Solid state | 24% | 21% | 32% | 24% |
| Touch* | 24% | 20% | * | * |
| Pushbotton | 24% | 15% | 18% | 12% |

* - Membrane and touch switches were combined in 1996 and 1994 studies.

| | <u>2001</u> | <u>1998</u> | <u>1996</u> | <u>1994</u> |
|--|-------------|-------------|-------------|-------------|
| Finishing systems/materials used: | | | | |
| Prefinished materials | 44% | 41% | 54% | 58% |
| Automated powder finishing | 44% | 38% | 35% | 47% |
| Prepainted materials | 36% | 58% | 46% | 50% |
| Coatings/finishes used | | | | |
| Powder | 51% | N/A | N/A | N/A |
| Pretreatment | 41% | N/A | N/A | N/A |
| Finishing systems/materials use will increase: | | | | |
| Automated powder finishing | 23% | 23% | 20% | 25% |
| Prefinished materials | 21% | 20% | 32% | 29% |
| Prepainted materials | 13% | 26% | 29% | 26% |
| Coatings/finishes use will increase: | | | | |
| Powder | 23% | N/A | N/A | N/A |
| Pretreatment | 11% | N/A | N/A | N/A |
| Fastening/joining methods used: | | | | |
| Adhesives | 85% | 81% | 83% | 88% |
| Screws | 82% | 86% | 86% | 90% |
| Bolts/nuts | 77% | 81% | 88% | 92% |
| Welding, resistance | 50% | 65% | 61% | 65% |
| Fastening/joining method use will increase: | | | | |
| Snap fits | 42% | 27% | 37% | 33% |
| Adhesives | 36% | 32% | 45% | 44% |
| Pressworking operations performed at location | 52% | 61% | N/A | N/A |
| More than 10 presses at location | 48% | 60% | N/A | N/A |
| 6 to 10 presses at location | 21% | 12% | N/A | N/A |
| Automated die change equipment currently used | 24% | 34% | 23% | 22% |
| Method of assembly - complete assembly cells | 62% | 57% | 39% | 37% |
| Testing equipment used: | | | | |
| Temperature measurement | 73% | 71% | 68% | N/A |
| Electrical standards | 67% | 65% | 77% | N/A |
| Leak detectors (electrical, electronic) | 46% | 60% | 52% | N/A |
| Sound/vibration | 44% | 45% | 56% | N/A |
| Environmental | 41% | 42% | 44% | N/A |
| Motor Testing | 41% | 41% | 42% | N/A |
| Insulation Leakage | 36% | 41% | 41% | N/A |
| Testing equipment type use will increase: | | | | |
| Electrical standards | 21% | 17% | 33% | N/A |
| Temperature measurement | 18% | 23% | 27% | N/A |
| Environmental | 15% | 17% | 23% | N/A |
| Sound/vibration | 13% | 18% | 22% | N/A |
| | | | | |
| Types of plastics and resins used: | | | | |
| ABS (thermoplastic) | 52% | 60% | 54% | N/A |
| Nylon (polyamide) (thermoplastic) | 47% | 53% | 63% | N/A |
| Polypropylene (thermoplastic) | 41% | 46% | 48% | N/A |

| | <u>2001</u> | <u>1998</u> | <u>1996</u> | <u>1994</u> |
|--|-------------|-------------|-------------|-------------|
| Plastics and resins type use will increase: | | | | |
| Polycarbonate (thermoplastic) | 17% | 17% | 16% | N/A |
| Polypropylene (thermoplastic) | 16% | 19% | 24% | N/A |
| ABS (thermoplastic) | 16% | 19% | 23% | N/A |
| Less than 10% of plastics used for structural parts | 48% | 45% | 43% | N/A |
| Cost as primary reason for increase in plastics use | 63% | 61% | 62% | N/A |
| Types of metals used: | | | | |
| Aluminum | 85% | 78% | 85% | 86% |
| Steel | 81% | 80% | 79% | 89% |
| Stainless steel | 80% | 79% | 75% | N/A |
| Metals type use will increase: | | | | |
| Aluminum | 29% | 28% | 29% | 27% |
| Stainless steel | 28% | 29% | 27% | N/A |
| Steel | 27% | 21% | 22% | 22% |
| 75% or more of metals used for structural parts | 48% | 42% | 45% | N/A |
| Performance as primary reason for increase in metals use | 59% | 49% | 61% | N/A |

Demographics

| | | | | |
|--|-----|-----|-----|-----|
| Market segment | | | | |
| HVAC | 28% | 26% | 21% | 20% |
| Housewares, power tools, lawn & garden | 19% | 13% | 16% | 11% |
| Test, lab and medical equipment | 18% | 14% | 19% | 18% |
| Commercial and vending machines | 14% | 14% | 17% | 13% |
| White goods | 11% | 8% | 9% | 9% |
| Consumer electronics | 9% | 12% | 12% | 12% |
| Water processing | 8% | 7% | 10% | 7% |
| Office, business and computer equipment | 7% | 12% | 11% | 13% |
| Job function - Design/R&D (including management) | 40% | 36% | 49% | 44% |
| Mfg/Production Engineering (including management) | 22% | 23% | 20% | 26% |
| Corporate management | 15% | 15% | 15% | 10% |
| Number of employees at location - 100 & over | 65% | 69% | 71% | 74% |
| Annual sales volume - \$49.1 million to \$99 million | 8% | 13% | 17% | 11% |
| \$99.1 million to \$999 million | 22% | 23% | 21% | 25% |
| \$1 billion and over | 20% | 21% | 18% | 18% |

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