

Automotive News

MARCH 5, 2001

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12 suppliers win PACE Awards

Automotive News and Cap Gemini Ernst & Young present the 12 winners of the 2001 Automotive News PACE Awards.

These automotive suppliers have been honored for showing the spirit of creativity through their products, management practices, environmental advances, information technology and other enduring innovations.

The winners were selected from 36 finalists by a panel of independent judges. The awards were presented at the seventh annual PACE Awards ceremony on Monday, March 5, at the Detroit Opera House.



BASF Corp.

Coatings and Colorants Division
Rastatt, Germany

Category: Open — environmental

For: Integrated paint process

Judges' citation: BASF developed and installed an integrated paint process that saves energy, cuts painting steps and eliminates volatile organic compound emissions.

The process eliminates drying stages and uses only a single, final paint-cure bake to finish the coating sequence. Colored waterborne primer coat, waterborne base coat and powder slurry clearcoats are applied wet-on-wet-on-wet. The process is viewed as a single, integrated function that saves energy and cuts paint use by 20 percent. And it meets tough environmental regulations. BASF took a significant risk by proposing a paint line with technology changes in each part of the process. The innovations required increased responsibilities on the supplier's part and deep integration with DaimlerChrysler team members.

The process is in place at DaimlerChrysler's automotive paint shop at Rastatt, Germany, where it has met quality objectives.



Robert Bosch GmbH

Stuttgart

Category: Europe — product

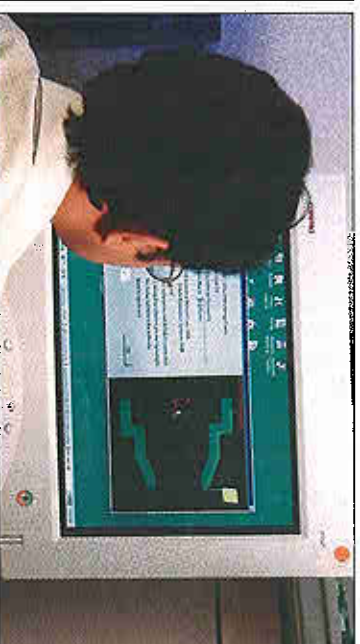
For: High-pressure common rail diesel technology

Judges' citation: Bosch has developed an innovative fuel-injection system that fundamentally changes the character of small diesel engines, making them quieter, smoother and cleaner running.

The Bosch high-pressure common rail injection system is electronically controlled and is decoupled from engine speed and load. This allows computers to choose the best injection pressure for fuel and the best timing of the injection itself. The system even allows multiple injections during a single cylinder's firing, giving engine designers the ability to tailor the way combustion patterns affect performance.

Both noise and emissions can be reduced compared to old-style, hydraulically operated direct injection systems. Improving the performance of diesel engines should make them acceptable in a wide variety of vehicles, including passenger cars.

The innovation provides a platform for further advances in direct diesel injection and may be a key to more use of fuel-efficient diesel engines in North America.



Delphi Automotive Systems Corp.

Troy, Mich.

Category: Information technology/Internet

For: Math-based Metal Removal Simulation

Judges' citation: Trial and error in machining processes is expensive. Delphi has developed intricate software that cuts the expense and risk in machining.

Math-based Metal Removal software uses a vast database and intricate programming to mathematically predict and control the machining process. The software lets engineers simulate operations — including lathe turning, drilling, grinding and bore tapping — then choose the best process and component design based on the data.

The software tool set also lets engineers bypass several manufacturing test stages that formerly were needed to set up a reliable machining process. Cutting forces, tool life, cycle time and scrap reduction can be precisely balanced in a virtual, rather than shop-floor, environment.

Delphi estimates its Windows-based software model, meant to run on personal computers, offers 15 percent savings over existing processes. The company believes it also has obtained a two- to three-year lead time over competitors in developing the software.



Hendrickson International

Woodridge, Ill.

Category: Product innovation

For: AIRTEK front suspension for heavy-duty trucks

Judges' citation: Hendrickson's innovative front steer axle for heavy-duty trucks is lighter than competitive spring and forged axle suspensions and is designed to need less maintenance than conventional front suspensions.

Truck trailers and drive-wheel axles have used light, durable air suspensions for years, but until recently the technology hasn't been successful in front axle applications. Designing a front axle that gives good control on uneven road surfaces without sacrificing driver comfort has been a challenge.

Hendrickson designed a front steer axle with air suspension for a 5.5-ton (12,000-pound) axle rating by developing a load-sharing mechanism that uses both a steel spring and an air spring. The module also includes a robotically welded steel axle beam with a strong box-section design. The axle uses a series of spring clamps with varying bolt torques to give progressive support without breaking the box form, further spreading loads. The suspension cuts maintenance, saves fuel and keeps drivers comfortably in control.

For more Automotive News Pace Award winners, see inside cover >

AUTOMOTIVE NEWS PAGE AWARDS WINNERS

Micronas GmbH

Freiburg, Germany

Category: Europe — product

For: Linear Hall-effect sensors
Judges' citation: Micro sensors that can be installed anywhere on a vehicle and report precise positioning information back to the vehicle's central computer are a vital part of emerging mechatronic systems for cars and trucks.

Micronas has created intelligent magnetic position sensors that use the Hall effect to replace mechanical micro switch sensors. In the Hall effect, a current passing through a magnetic field produces a specific voltage, called the Hall Voltage, that is different from that of the magnetic field or the main current.

Using this effect, Micronas sensors can translate a variety of information — such as gas pedal position, fuel level, transmission stick position and ride height — and synthesize the information with memory and computing power at the sensor itself. Because the sensor is a noncontact, solid-state device, it can survive in harsh environments and dirty locations.

Future cars may have as many as 100 such inexpensive, distributed sensors on each vehicle, five times more than today's average.



NUCAP Industries Inc.

Toronto

Category: Manufacturing process

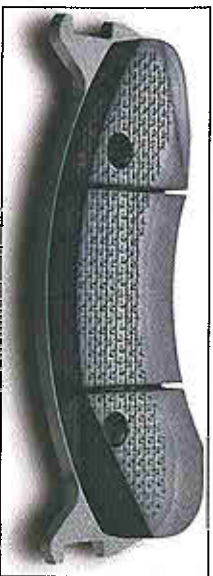
For: NUCAP Retention System

Judges' citation: Creation of a mechanical lock to hold brake friction material onto the metallic backing plate changes the way brake pads are made and makes the process more efficient.

NUCAP's retention system gouges a pattern of opposing hooks into the metal surface of a brake backing plate. Friction material is then formed directly on the hooks, locking it in place. This eliminates the need to glue friction material to the plate, cutting a material expense from the assembly process.

The one-step gouging also takes time out of traditional brake pad assembly. It eliminates the need for sandblasting, degreasing, coating and paint preparation that were formerly needed to prepare both plate and friction material for adhesives. Reducing the number of steps in assembly and minimizing sequence mistakes improve quality.

The simplified mechanical lock process also is environmentally friendly, so there is no need for the volatile organic compounds previously used in the preparation and adhesive-curing steps.



PPG Industries Inc.



Pittsburgh

Category: Product innovation

For: Audioguard acoustical coating

Judges' citation: PPG has created the first 100 percent solids sprayable coating to cut down on body panel noise in cars.

Audioguard Acoustical Coating can replace the five to 17 asphaltic pads that today are individually applied to a car body to cut down on booming and vibration of steel body panels.

The pads are needed because customers equate quietness with vehicle quality. But applying them is difficult; the pads are hard to place on vertical surfaces, they add assembly time and can introduce dirt that mars paint in later assembly steps.

PPG's coating, applied by a robotic sprayer in a computer-optimized pattern, can put almost a gallon of the acoustical coating in place in about 45 seconds. The coating is cured later in the standard paint line sequence.

The technology was first used at DaimlerChrysler's Jefferson North Assembly Plant in Detroit in 1999 and today is used at five automotive plants.

Raytheon Commercial Infrared

Dallas

Category: Product innovation

For: Night Vision Infrared sensing system

Judges' citation: Night Vision, introduced on the 2000 Cadillac DeVille, is a success story for converting expensive military sensing technology into an option suitable for automotive use.

Infrared sensing systems develop an image based on the temperature difference between objects. Military use of such systems has been common for more than 20 years, including night vision binoculars and sniper scopes.

Raytheon's innovation was to convert large, expensive technology into a small sensing chip and camera that mount unseen in a vehicle grille.

Night Vision senses minute temperature differences in targets at a range of 500 yards, three or more times farther than the reach of conventional headlights. The technology then projects the image in white-on-dark form on a small head-up display just below the driver's normal windshield view. Since the system sees heat but not light, it can help drivers stay on track through the glare of oncoming headlights.

Images are scaled to appear the same size they would when seen normally by daylight, so a driver can judge distance correctly and take appropriate action. This system, now appearing on some heavy trucks as well, is expected to improve night driving safety by reducing the chance for collisions, especially with animals, pedestrians or stopped vehicles.



ZF Industries Inc.

Tuscaloosa, Ala.

Category: Management practice

For: Ergonomically based job rotation program

Judges' citation: ZF-Tuscaloosa has recorded 90 percent fewer OSHA-recordable incidents and an 83 percent reduction in workers' compensation costs with an innovative system to determine stresses on a worker's body and avoid them in a planned way.

The system analyzes individual motions in the plant's tasks, identifies a numerical "body parts index" that ranks those motions by injury potential, and then uses the data to correctly assign workers to various levels of activity to avoid repetitive stress-related injuries.

ZF and its workers are able to use agreed-upon, objective ways to communicate and plan their work level to protect health. The process also identifies which tasks should be re-engineered.

Finally, the process includes an ongoing audit to ensure it is being followed and improved continuously. This system was created with support from the Alabama State Center for Occupational Health and Auburn Engineers Inc., an ergonomics-engineering firm.



Quality Measurement Control Inc.

Auburn Hills, Mich.

Category: Information technology/Internet

For: CM4D Analyze data management and reporting software

Judges' citation: One of the biggest barriers to rapid product development is caused by the immense task of maintaining measurement accuracy, integrity and stability during the development of production tooling and processes.

Quality Measurement Control's software breaks the measurement barrier by aggregating and stabilizing dimensional data directly from engineering work being done or developed in different environments and locations. It makes sheet-metal assemblies, interior trim, glass, moldings, exterior components and powertrain components self-reporting for measurement purposes. Most important, it is dimensionally stable.

The Windows-based software nails down data earlier in the prototype phase and provides ongoing statistical process control in the factory. It communicates with central repository databases including DB2, SQL, Sybase, Oracle and Access.

Letting engineers work on a common global platform and send harmonized data to one another via the Internet means faster and more accurate production.

CM4D software is being used by DaimlerChrysler, Honda and Freightliner as well as supplier customers.



Shape Corp.

Grand Haven, Mich.

Category: Open — enduring innovations

For: Tubular high-strength swept bumpers

Judges' citation: Roll-formed bumpers with a "D" or "B" cross-section shape are the norm today. But before 1993, most bumpers were stamp-formed or plastic-injected in a more costly and cumbersome process that required extensive tooling and molds.

Shape Corp. was the company that brought the roll-formed lightweight bumper to the market. The product was introduced on Chrysler vehicles. The technology has allowed bumpers to follow design needs, incorporating curves and sweeps that challenged stamping methods but at lower cost and with significant weight savings.

Shape has used the strength of its roll-forming expertise to command 30 percent of the bumper market worldwide. It is the first U.S. company to ship these components to Japan for car assembly there. Tubular roll-formed bumpers are on at least 32 individual makes and models today, including vehicles from Chrysler, Nissan, Honda, Toyota, General Motors and Mitsubishi.



Tenneco Automotive

Monroe, Mich.

Category: Product innovation

For: Acceleration Sensitive Damping shock absorber

Judges' citation: Tenneco's new system breaks the compromise between a suspension tuned for a soft ride and one tuned for crisp handling. Acceleration Sensitive Damping relies on an acceleration-sensitive mechanical valve to direct oil flow in the shock absorber.

The valve opens and closes quickly to adjust to rapid wheel movements and bumps, giving a soft ride over rough surfaces. But when the valve senses slower acceleration body rolls, such as the forces in rounding a corner, it remains closed and gives a stiffer ride for more vehicle control.

The system is less costly and less complex than electronic stability systems aimed at achieving the same goal. Tenneco engineers tested more than 500 prototypes and one million cycles of high-speed events and developed the optimum technology to switch oil damping from "firm" to "soft" ride in 15 milliseconds.

Tenneco's technology has been introduced into the automotive aftermarket under the "Reflex" brand. It is currently installed as original equipment on the Nissan Altima SE and will be on the 2002 Lincoln Blackwood luxury pickup.



AUTOMOTIVE NEWS PACE AWARDS

Green opportunities knock for suppliers

Automakers want it faster and cheaper; making things cleaner scores points, too

Automotive News



A W A R D

Auto companies ask a lot from their suppliers. Low cost, perfect quality and speedy delivery are the usual starting points. Now, as environmental concerns grow, clean is becoming more important.

PACE Awards finalist Hutchinson F.T.S. Inc. has delivered by creating a sealing system that cuts down on refrigerant leaks into the atmosphere. PPG Industries Inc., meanwhile, has developed a lead-free process for priming auto bodies.

They are two of four finalists in the environmental category of this year's Automotive News PACE Awards contest. The seventh annual event, co-sponsored by Cap Gemini Ernst & Young, honors innovation in the automotive supply community.

The seven finalists on this page are among 36 profiled since our Feb. 5 issue. PACE Award winners will be announced tonight, March 5, in Detroit and will be featured in our March 12 issue.



Scientific solution to assembly line injuries

ZF Industries Inc.
Tuscaloosa, Ala.

Category: Management practice

For: Employee rotation process

This process reduces the nature and number of repetitive stress injuries and force disorders plaguing automotive assembly processes. A disciplined and scientific approach to indexing and allocating tasks appropriately has met with tremendous success and employee acceptance.

Safe haven

SICK Inc.
Waldkirch, Germany

Category: Open — enduring innovations

For: Proximity laser scanner

SICK's sophisticated laser scanning systems ensure safety zones by warning of the entry of personnel into hazardous areas. Unlike other devices, SICK's systems can protect in irregularly shaped work areas. The systems can automatically stop hazardous machinery when worker safety is threatened.



Shiny armor

Lacks Enterprises Inc.
Grand Rapids, Mich.

Category: Open — enduring innovations

For: HIP-140

HIP-140, meaning "high-impact plated plastic," refers to both the product and the related processes that can produce a range of chrome-plated interior and exterior vehicle parts. It combines the design flexibility of thermoplastics with the "brightness" of chrome, together with an enhanced ability to withstand severe impact.



Lead-free protection

PPG Industries Inc.
Automotive Coatings
Cleveland

Category: Open — environmental

For: Enviro-Prime 2000

This automotive electrocoat primer is used at automakers' paint facilities to provide corrosion protection and a clean, smooth surface for subsequent paint base coat and clear coat — without using lead.



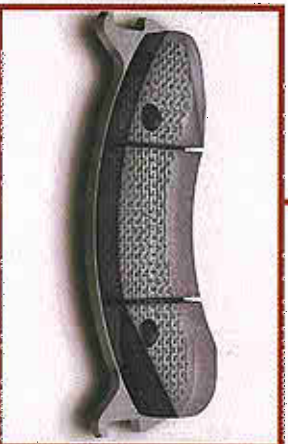
Braking the mold

NUCAP Industries Inc.
Toronto

Category: Manufacturing process

For: NUCAP Retention System

NUCAP's innovation overthrows accepted but flawed industry practices in attaching brake friction material to steel backing plates. This simple system of gouging hooks pointing in opposite directions directly into the backing plate eliminates pad delamination and improves manufacturing processes by eliminating sandblasting as well as the use of paint, adhesives, hazardous chemicals and volatile organic compounds.



Solid seal

Hutchinson F.T.S. Inc.
Troy, Mich.

Category: Open — environmental

For: Dual plane seal

This innovative sealing system reduces refrigerant leaks and can cut the number of air-conditioning recharges in half during the life of a vehicle. Better still, refrigerant no longer escapes into the atmosphere.



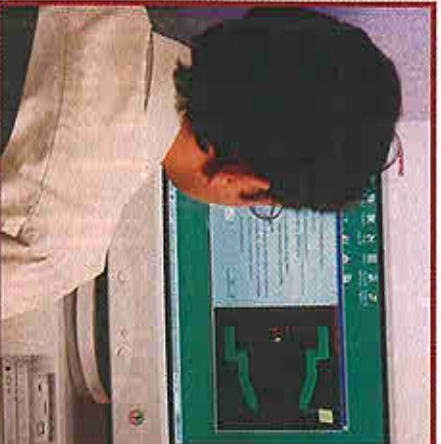
Calculated control

Delphi Automotive Systems Corp.
Troy, Mich.

Category: Information technology/Internet

For: Math-Based Metal Removal Simulation

These simulation tools permit modeling of turning, milling, boring, grinding and tapping processes in a personal computer-based software system. The ability to calculate and control machining forces is a key feature, with benefits in cost savings, scrap reduction, cycle time and tool life.



See our Web site for previously profiled 2001 finalists, a list of judges, and past winners of the Automotive News PACE Awards. AutomotiveNews.com

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Congratulations To THE 2001 Automotive News PACE AWARD WINNERS

BASF Corporation -
Coatings and Colorants Div
The Integrated Process
Open Category - Environmentally

Delphi Automotive
Math-Based Metal Removal
(MBMR)
IT/Internet category

Hendrickson Int'l
AIRTEK/Integrated
Suspension and
Product Category

Micronas
Linear Hall Effect
Europe Category

Nucap
Nucap Flexible
Manufacturing

PPG
Automotive
Interior

Measurement Control, Inc.
CM4D Analyze
IT/Internet Category

Commercial Infrared
Night Vision
Product Category

Bosch Corporation
Pressure Common Rail
Open Category

Corporation
Strength Sway Bar Limper
Electrical Vehicle

Automotive, Inc.
Sensitive Manufacturing
Product Category

Incorporated
Job Assignment
Production Process
Manufacturing

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