Safety as a Quality Feature in Automobile Industry

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ABSTRACT

This paper summarizes the increased need for safety related aspects incorporated by Automobile manufactures the world over. Over the past 10 years safety has become much of a selling point in the automobile market as fuel Economy. Thus Automobile marketer's have started marketing quality is a safety feature the world over.

Introduction

Environmental imperatives and safety requirements are two critical issues facing the automotive industry, worldwide. Indian Automobile Industry in the last decade has made significant progress on the environmental front by adopting stringent emission standards, and is progressively aligning technically with international safety standards.

Vehicles being manufactured in the country have to comply with relevant Indian Standards (IS) and Automotive Industry standards (AIS). Indian Standards (IS) have been issued since the late 1960s and these standards for Automotive Components were based on EEC/ISO/DIN/BSAU/FMVSS etc at that time. Regulations are reviewed periodically by the Technical standing Committee on MCVR (CMVR-TSC).

Since 2000 ECE Regulations have been used as basis for Indian regulations and since 2003, increased efforts are being made to technically align with ECE. Variance from ECE exists on formatting phraseology and administration related issues.

In order to have a planned approach to introduction of advanced safety features, SIAM drew up a Road Map for Automobile Safety Standards. The Roadmap is prepared by the CMVR, Safety & Regulations Committee. The current traffic conditions, driving habits, traffic density and road user behaviour necessitate that maximum safety be built into the vehicles. Progressive tightening of safety standards taking into account unique India requirements has been addressed by the Road Map with a view to reducing the impact of accidents and thereby improving safety of the vehicle occupants and vulnerable road users.

Automobile safety

Automobile safety is the study and practice of vehicle design, construction, and equipment to minimize the occurrence and consequences of automobile accidents. (Road traffic safety more broadly includes roadway design. One of the first formal academic studies into improving car safety was by Cornell Aeronautical Labs of

Buffalo, New York. The main conclusion of their extensive report is the crucial importance of seat belts and padded dashboards.

Improvements in roadway and automobile designs have steadily reduced injury and death rates in all first world countries. Nevertheless, auto collisions are the leading cause of injury-related deaths, in most developing as well as under developed nations.

Active and passive safety

The terms "active" and "passive" are simple but important terms in the world of automotive safety. "Active safety" is used to refer to technology assisting in the prevention of a crash and "passive safety" to components of the vehicle (primarily airbags, seatbelts and the physical structure of the vehicle) that help to protect occupants during a crash.

Crash avoidance

Crash avoidance systems and devices help the driver — and, increasingly, help the vehicle itself— to avoid a collision. This category includes:

- The vehicle's headlamps, reflectors, and other lights and signals
- The vehicle's mirrors
- The vehicle's brakes, steering, and suspension systems

Driver assistance

A subset of crash avoidance is driver assistance systems, which help the driver to detect ordinarily-hidden obstacles and to control the vehicle. Driver assistance systems include:

- Automatic Braking systems to prevent or reduce the severity of collision.
- Infrared night vision systems to increase seeing distance beyond headlamp range.
- Adaptive headlamps control the direction and range of the headlight beams to light the driver's way through curves and maximize seeing distance without glaring other drivers.
- Reverse backup sensors, which alert drivers to difficult-to-see objects in their path when reversing.
- Backup camera.
- Adaptive cruise control which maintains a safe distance from the vehicle in front.
- Lane departure warning systems to alert the driver of an unintended departure from the intended lane of travel.
- Tire pressure monitoring systems or Deflation Detection Systems.
- Traction control systems which restore traction if driven wheels begin to spin.
- Electronic Stability Control, which intervenes to avert an impending loss of control.
- Anti-lock braking systems.
- Electronic brake force distribution systems.
- Emergency brake assist systems.
- Cornering Brake Control systems.
- Pre-crash system.
- Automated parking system.

Crash worthy systems and devices prevent or reduce the severity of injuries when a crash is imminent or actually happening. Much research is carried out using anthropomorphic crash test dummies.

- Seatbelts limit the forward motion of an occupant, stretch to absorb energy, to lengthen the time of the occupant's deceleration in a crash, reducing the loading on the occupant's body. They prevent occupants being ejected from the vehicle and ensure that they are in the correct position for the operation of the airbags.
- Airbags inflate to cushion the impact of a vehicle occupant with various parts of the vehicle's interior. The most important being the prevention of direct impact of the driver's head with the steering wheel and door pillar.
- Laminated windshields remain in one piece when impacted, preventing penetration of unbelted occupants' heads and maintaining a minimal but adequate transparency for control of the car immediately following a collision. It is also a bonded structural part of the safety cell. Tempered glass side and rear windows break into granules with minimally sharp edges, rather than splintering into jagged fragments as ordinary glass does.
- Crumple zones absorb and dissipate the force of a collision, displacing and diverting it away from the passenger compartment and reducing the deceleration impact force on the vehicle occupants. Vehicles will include a front, rear and maybe side crumple zones (like Volvo SIPS) too.
- Safety Cell - the passenger compartment is reinforced with high strength materials, at places subject high loads in a crash, in order to maintain a survival space for the vehicle occupants.
- Side impact protection beams.
- Collapsible universally jointed steering columns, along with steering wheel airbag. The steering system is mounted behind the front axle - behind and protected by, the front crumple zone. This reduces the risk and severity of driver impact or even impalement on the column in a frontal crash.
- Pedestrian protection systems.
- Padding of the instrument panel and other interior parts, on the vehicle in areas likely to be struck by the occupants during a crash, and the careful placement of mounting brackets away from those areas.
- Cargo barriers are sometimes fitted to provide a physical barrier between passenger and cargo compartments in vehicles such as SUVs, station wagons and vans. These help prevent injuries caused by occupants being struck by unsecured cargo. They can also help prevent collapse of the roof in the event of a vehicle rollover.

Lights and reflectors

Vehicles are equipped with a variety of lights and reflectors to mark their presence, position, width, length, and direction of travel as well as to convey the driver's intent and actions to other drivers. These include the vehicle's headlamps, front and rear position lamps, side marker lights and reflectors, turn signals, stop (brake) lamps, and reversing lamps.

Vehicle colour

The Vehicle Colour Study, conducted by Monash University Accident Research Centre (MUARC) and published in 2007, analyzed 855,258 accidents occurring between 1987 and 2004 in the Australian states of Victoria and Western Australia that resulted in injury or in a vehicle being towed away. The study analysed risk by light condition. It found that in daylight black cars were 12% more likely than white to be involved in an accident, followed by grey cars at 11%, silver cars at 10%, and red and blue cars at 7%, with no other colours found to be significantly more or

less risky than white. At dawn or dusk the risk ratio for black cars jumped to 47% more likely than white, and that for silver cars to 15%. In the hours of darkness only red and silver cars were found to be significantly more risky than white, by 10% and 8% respectively.

Below is an overview of common safety features found in most new cars in India.

Anti-Lock Braking Systems

Anti-Lock Braking Systems (ABS) made their debut in the U.S. market in the late 60's as optional equipment on the Lincoln Continental Mark III. The system was unreliable and was discontinued, but it was a glimpse into what was to come in automobile braking systems. Though not new technology, ABS is one of the most important safety features available on a new car. Anti-Lock Brakes are available on just about every vehicle sold in the U.S. Most vehicles have them as standard equipment, but many less-expensive base models can be purchased without ABS in India.

The theory behind ABS is that a sliding tire has less stopping power than a tire in solid contact with the road. Before ABS, drivers were taught to "pump" their brakes during an emergency stop. This technique prevented skidding by releasing pressure on the brakes momentarily, which allows the tires to regain traction if they have started to skid. ABS takes this idea a step further, since a computer can react and modulate the power brakes of an automobile quicker than the driver. When the ABS system in a car senses that a tire has lost traction and is skidding, it reduces the braking power for a fraction of a second, allowing the tire to regain traction, and then the system reapplies the braking power. This system allows ABS equipped vehicles to stop quicker than similar vehicles without ABS. If you are considering purchasing a vehicle without ABS, find out how much the same model with ABS is. It may only be a little bit more money, but it's well worth the investment.

Traction Control

Traction control works in a similar manner to Anti-Lock braking systems, and in a way, it is almost like ABS in reverse. Traction control systems are designed to keep your tires from skidding, but as ABS helps you decrease speed, traction control helps you maintain control when increasing speed. When driving on slippery roads, especially on snow or ice, it is easy to spin the drive wheels of a vehicle. When the drive wheels skid, not only does the vehicle lose traction and waste energy, but losing traction could cause a vehicle to skid sideways and lose control. Traction control systems monitor the speed of all 4 tires, and if it senses one tire moving faster than the others, the computer slows that wheel down so that it may regain traction. This is done by electronically reducing power to the drive wheels by adjusting the throttle or by adjusting the engines combustion to reduce power. Some systems use the ABS system to pulse the brakes and slow down the skidding tire.

Electronic Stability Control

Electronic Stability Control (or ESC) is an electronic system that monitors the stability of a vehicle, and electronically intervenes with the drivers controls in the event that the vehicle becomes unstable. This can be very helpful in preventing an accident by helping the driver maintain control of their vehicle during emergency maneuvers.

Airbags

Airbag Technology has improved greatly over the past few years. When introduced in the late 80's, most cars only had a driver's side airbag. Now, it is common to find as many as 6 airbags in one vehicle. These new airbags are sometimes called "Dual-Stage Airbags" meaning that they deploy at different speeds

or different pressures, depending on the force of the accident. However, in order for airbags to function properly, passengers must wear their seat belts to prevent then from moving into a position where an expanding airbag may hurt them.

Safety Belts

Safety belts have also evolved dramatically over the past few years. Consumers can now buy cars with intelligent seat belts that modulate the tension of the belt during a crash. Integrated Safety belt systems mount the shoulder belt not to the inside wall of the car, but to the seat back itself. This allows the safety belt to move with the passenger, no matter where the seat is positioned. This results in a more comfortable fit and it is more effective at holding a passenger in their seat than the traditional method.

Preventative Safety Technology

Other new safety features are designed to prevent accidents. A few luxury manufacturers are offering night-vision display systems that enhance a driver's vision, making it easier to see problems in low-light situations. Also available on many vehicles is rear facing cameras that allow drivers to get a better look at what is behind them when backing up. Certain models also have a radar system installed that alerts the driver if they are getting too close to another solid object while in reverse.

History of Automobile Safety

Automobile safety may have become an issue almost from the beginning of mechanized road vehicle development. The second steam-powered "Fardier" (artillery tractor), created by Nicolas-Joseph Cugnot in 1771, is reported by some to have crashed into a wall during its demonstration run. However according to Georges Ageon, the earliest mention of this occurrence dates from 1801 and it does not feature in contemporary accounts. One of the earliest recorded automobile fatalities was Mary Ward, on August 31, 1869 in Parsonstown, Ireland. In the 1930s, plastic surgeon Claire L. Straith and physician C. J. Strickland advocated the use of seat belts and padded dashboards. Strickland founded the Automobile Safety League of America. In 1934, GM performed the first barrier crash test.

In 1937, Chrysler, Plymouth, DeSoto, and Dodge added such items as a flat, smooth dash with recessed controls, rounded door handles, and the back of the front seat heavily padded to provide protection for rear passengers. In 1942, Hugh DeHaven published the classic Mechanical analysis of survival in falls from heights of fifty to one hundred and fifty feet.

In 1947 the American Tucker was built with the world's first padded dashboard. In 1949 SAAB incorporated aircraft safety thinking into automobiles making the Saab 92 the first production SAAB car with a safety cage. In 1956, Ford tried unsuccessfully to interest Americans in purchasing safer cars with their Lifeguard safety package. In 1958, the United Nations established the World Forum for Harmonization of Vehicle Regulations, an international standards body advancing auto safety. Many of the most life saving safety innovations, like seat belts and roll cage construction were brought to market under its auspices. That same year, Volvo engineer Nils Bohlin invented and patented the three-point lap and shoulder seat belt, which became standard equipment on all Volvo cars in 1959. Over the next several decades, three-point safety belts were gradually mandated in all vehicles by regulators throughout the industrialized world.

In 1966, the U.S. established the United States Department of Transportation (DOT) with automobile safety one of its purposes. The National Transportation Safety Board (NTSB) was created as an independent organization on April 1, 1967, but was reliant on the DOT for administration and funding. However, in 1975 the organization was made completely independent by the Independent Safety Board Act (in P.L. 93-633; 49 U.S.C. 1901). Volvo developed the first rear-facing child seat in 1964 and introduced its own booster seat in 1978. Consumer information label for a vehicle with at least one US NCAP star rating In 1979, the U.S. National Highway Traffic Safety Administration (NHTSA) began crash-testing popular cars and publishing the results, to inform consumers and encourage manufacturers to improve the safety of their vehicles. Initially, the US NCAP crash tests examined compliance with the occupant-protection provisions of FMVSS 208. Over the subsequent years, this NHTSA program was gradually expanded in scope. In 1997, the European New Car Assessment Programme (Euro NCAP) was established to test new vehicles' safety performance and publish the results for vehicle shoppers' information.[1211] The NHTSA crash tests are presently operated and published as the U.S. branch of the international NCAP programme.

In 1984, New York State passed the first US law requiring seat belt use in passenger cars. Seat belt laws have since been adopted by all 50 states, except for New Hampshire.[1261] and NHTSA estimates increased seat belt use as a result save 10,000 per year in the USA. In 1986, the central 3rd brake light was mandated in North America. Over the next 15 years, most of the world's other jurisdictions mandated the 3rd brake lamp as well. In 1995, the Insurance Institute for Highway Saletv (IIHS) began frontal offset crash tests. In 1997, EuroNCAP was founded.

In 2003, the IIHS began conducting side impact crash tests. In 2004, NHTSA released new tests designed to test the rollover risk of new cars and SUVs. Only the Mazda RX-8 got a 5-star rating. In 2009, Citroen became the first manufacturer to feature "Snowmotion", an Intelligent Anti Skid system developed in conjunction with Bosch, which gives drivers a level of control in extreme ice or snow conditions similar to a 4x4.

ASTM Standards:

Driving Quality and Safety in the Automotive Industry:

When the estimated 600 million passenger cars travel the roads of the world each day, ASTM International standards are helping to enhance the quality, safety and performance of the vehicles we drive. Throughout the industry supply chain, ASTM standards assist in the delivery of high quality, expertly tested parts and materials to automotive manufacturers. At local car dealerships, ASTM standards aid consumer confidence by better ensuring that the vehicles they buy are durable. And out on the road where safety and reliability matter most, ASTM standards facilitate dependable vehicle performance.

ASTM STANDARDS: FACILITATING QUALITY IN THE AUTOMOTIVE SUPPLY CHAIN

To supply the automotive sector, steel manufacturers often depend upon test methods developed by ASTM International's oldest committee, A01 on Steel, Stainless Steel and Related Alloys. With a membership of 1,000 industry professionals who participate on one or more of 22 standards-writing subcommittees, A01 has responsibility for more than 500 materials specifications and test methods.

To test the readiness and integrity of steel for the rigors of automotive production, manufacturers use such A01 standards as ASTM A370, Test Methods and Definitions for Mechanical Testing of Steel Products, which is particularly useful in determining the strength and ductility of steel. Another notable, similarly useful standard is ASTM A764, Specification for Metallic Coated Carbon Steel Wire, Coated at Size and Drawn to Size for Mechanical Springs.

COMMITTEE E28: THE LEADER IN MECHANICAL TESTING STANDARDS

Automotive material suppliers also rely on standards of ASTM International Committee F.28 on Mechanical Testing to meet quality control demands. Across its 11 subcommittees, E28 maintains more than 55 standards that address ductility and formability, indentation hardness, impact and residual stress—all critical requirements for automotive materials.

One widely referenced E28 standard is ASTM E8/E8M, Test Methods for Tension Testing of Metallic Materials. During automotive manufacturing, flat-rolled metals are shaped into finished car designs. Tension tests provide a valuable reference for suppliers to measure the strength and ductility of materials under uniaxial tensile stresses, information used in material comparison, alloy development, quality control and design.

Another key automotive material consideration is spring back, which occurs when a metal or alloy is cold-worked; on release of the forming force, the material tends to partially return to its original shape because of elastic recovery properties. To respond to marketplace needs, Committee E28 released ASTM E2492, Test Method for Evaluating Spring back of Sheet Metal Using the Demeri Split Ring Test. Developed with input from automotive industry stakeholders, E2492 provides a test to evaluate metal spring back behavior through simulating a stretch-draw forming process.

F16 FASTENER STANDARDS: MAKING A DIFFERENCE IN AUTOMOBILE SAFETY

Fasteners—nuts, bolts, screws, retainers, spring clips or washers—play an important role in car equipment safety. Typically made from plastic or steel, fasteners must have a high shock and vibration resistance and most important, must be strong enough to withstand the impact of accidents. To test the quality, strength and durability of the fasteners they supply to the automotive market, manufacturers rely on the more than 77 standards developed by ASTM International Committee F16 on Fasteners.

Subcommittee F16.02 on Steel Bolts, Nuts, Rivets and Washers has an extensive array of standards, including many that arc widely referenced by fastener manufacturers. Notable among these is A307, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength, which covers the chemical and mechanical requirements of three grades of carbon steel bolts and studs in sizes ranging from 1/4 to 4 inches. Also utilized by automotive suppliers is A325, Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength, which covers the requirements for heavy hex structural bolts intended for use in structural connections.

ASTM PAINT STANDARDS: EXTENDING THE SERVICE LIFE OF TODAY'S AUTOMOBILES

One important factor that impacts vehicle service life is a cars finish and its ability to withstand corrosion or other degradation. Thanks to many standards from ASTM International Committee D01 on Paint and Related Coatings, Materials and Applications, consumers can trust that the luster and durability of their cars finish can stand the test of time. Formed in 1902, D01 today has a diverse membership of 625

global stakeholders and a portfolio of 635 standards. Among its 30 technical subcommittees, one of the most prominent ones addressing automotive sector standards requirements is D01.27 on Accelerated Testing.

D01.27 provides standards to evaluate film performance of applied paint and finishes subjected to accelerated deterioration in normal and abnormal service environments. Improvements in automotive coating performance and durability can be attributed in part to the groups accelerated test procedures. One popular DO 1.27 standard for automotive applications is D6695, Practice for Xenon-Arc Exposures of Paint and Related Coatings, which simulates the effects of sunlight, moisture and heat on paints. A popular weathering and corrosion test procedure is AS I'M D5894, Practice for Cyclic Salt Fog/UV Exposure of Painted Metal, which blends cyclic corrosion testing with the evaluation of ultraviolet exposure of paints on metal.

Extreme weather conditions are the focus of another widely referenced DO 1.27 standard, D6675, Practice for Salt-Accelerated Outdoor Cosmetic Corrosion Testing of Organic Coatings on Automotive Sheet Steel. D6675 helps to evaluate the corrosion resistance of organic coatings on metal products exposed to highly salty environments such as areas subjected to deicing salts or coastal areas.

REDUCING THE HEALTH RISKS OF VOLATILE ORGANIC COMPOUNDS

A critical issue in the automobile industry is identifying and quantifying volatile organic compounds (VOCs) in newly manufactured automobiles. Indoor air contamination is caused by VOC emissions from paints, fabrics, upholstery, carpets and adhesives as well as from exhaust fumes. The toxicity of many of these components creates potential health risks.

In the United States, regulations limiting VOC emissions from paints and coatings rely on ASTM measurement standards for total volatile content, exempt solvent content and paint or coating density. The U.S. Environmental Protection Agency references numerous D01 standards in regulations as acceptable test methods for regulatory compliance. Among these arc D1475, Test Method for Density of Liquid Coatings, Inks and Related Products, and D2369, Test Method for Volatile Content of Coatings.

G03 HELPS BUILD DURABLE AUTOS

Complementing D01 activities in serving automotive standards needs is ASTM International Committee G03 on Weathering and Durability. G03 publishes more than 30 standards, many of which provide valuable utility for automotive manufacturers and suppliers in measuring the performance of automotive paint and coatings, and interior dashboard materials, in varying weathering exposures. Many D01 material standards reference G03 weathering standards for guidance on specimen conditioning and preparation as well as for specifying laboratory accelerated test apparatus and natural outdoor exposure protocols.

Key G03 performance standards arc G151, Practice for Exposing Nonmetallic Materials in Accelerated Test Devices that Use Laboratory Light Sources; G152, Practice for Operating Open Flame Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials; and GI54, Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials. All of these standards help measure the effects of sunlight (either direct or through window glass), moisture such as rain or dew and heat on automotive components.

ROAD SAFETY AND PERFORMANCE WITH THE HELP OF ASTM AIR BAG STANDARDS

Airbags play a vital part in protecting people from injury as a result of automobile accidents. Companies involved in the manufacturing of airbags can better

ensure their products' performance thanks to ASTM standards focused on the design, quality and performance of inflatable restraints.

ASTM Subcommittee D 13.20 on Inflatable Restraints, which is part of Committee D13 on Textiles, has taken the lead in developing test methods and practices for such airbag requirements as air permeability on deployment, scam strength, fabric stability during stress, ability to hold inflation pressure and durability. Many of the 12 standards from D13.20 arc cited in automotive material specifications used by manufacturers worldwide.

Newest among these is ASTM D7559/D7559M, Test Method for Determining Pressure Decay of Inflatable Restraint Cushions, a cost-eclectic screening test to judge the ability of a rollover side curtain airbag to maintain needed pressure over time. Side curtain airbags are usually mounted in the roof of a vehicle and burst through the headliner to cover the side window area in the event of a side impact or rollover accident. Other notable D 13.20 standards provide guidelines to assess inflatable restraint fabric quality. These include D5426, Practices for Visual Inspection and Grading of Fabrics Used for Inflatable Restraints, and D5446, Practice for Determining Physical Properties of Fabrics, Yarns and Sewing Thread Used in Inflatable Restraints.

COMMITTEE F09: EXPERT SOURCE FOR TIRE SAFETY STANDARDS

For nearly 40 years, ASTM Committee F09 on Tires has been the pre-eminent source for tire safety standards widely accepted worldwide. Committee F09's 105 members include a broad cross section of industry and public stakeholders who work together to create critical tire performance lest methods. F09 has a long history of delivering the relevant, high quality standards that guide tire-related regulatory requirements set forth by the National Highway Traffic Safety Administration.

A recent significant F09 focus has been the testing and measurement of tire aging because of increased tire wear life and resulting additional industry and regulatory interest in the subject. The U.S. Congress formalized this need when it passed the Transportation Recall Enhancement, Accountability and Documentation (TREAD) Act, which calls for an upgrade of tire safety standards, including an aged durability test for light vehicle tires.

Subcommittee F09.30 on Laboratory (Non-Vehicular) Testing responded to the call with a task group to spearhead the development of a protocol to artificially age radial light vehicle tires in the laboratory and then evaluate tire durability on a road wheel.

D02 STANDARDS: CLEANER GASOLINE, BETTER AUTOMOBILE PERFORMANCE

With more than 2,200 members from 65 countries, ASTM Committee D02 on Petroleum Products and Lubricants benefits from global expertise that has produced more than 725 standards accepted worldwide. Virtually any product that requires fuels or operates on moving parts depends on standards developed by D02s 33 subcommittees. Highlighting the diverse D02 portfolio are standards that provide for safe, economical and environmentally sound fuels. These include ASTM D2700, Test Method for Motor Octane Number of Spark-Ignition Engine Fuel, and D4814, Specification for Automotive Spark-Ignition Engine Fuel, both of which ensure the indicated octane number at local gas stations.

As momentum continues to build for alternative fuels, Committee D02 has established a leadership position in standards for fuels such as ethanol and biodiesel. Ethanol is widely used in the U.S. as a gasoline extender and octane enhancer; it also helps to reduce harmful emissions. Committee D02 has contributed standards that

assist in the production of ethanol, including D5798, Specification for Fuel Ethanol (Ed75-F,d85) for Automotive Spark-Ignition Engines, and D4806, Specification for Denatured Fuel Ethanol for Blending with Gasolines for Use as Automotive Spark-Ignition Engine Fuel.

Biodiesel is an alternative fuel comprised of mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats. D02's flagship biodiesel standards are ASTM D6751, Specification for Biodiesel Fuel Blend Stock (B100) for Middle Distillate Fuels, and D7467, Specification for Diesel Fuel Oil, Biodiesel Blend (B6 to B20).

Committee D02 also provides standards that address the oil and lubricants used in automotive engines. The performance of motor oil to cool engine parts, reduce friction and protect against wear and corrosion is supported by D02 standards such as ASTM D4485, Specification for Performance of Engine Oils.

COOPERATION FOR ENGINE COOLANTS

Standards from ASTM International Committee D15 on Engine Coolants address a wide range of automotive related issues including cavitation, corrosion and formulations of coolants for cars, light trucks and heavy duty engines. Formed in 1947, D15 now numbers 130 technical experts from 13 countries.

Recent D15 activities respond to changing emissions restrictions and consumer desire for lower automotive cooling system maintenance costs. In 2009, Committee D15 issued three new standards focused on the formulation of 1,3-propanediol (PDO) based engine coolants. PDO, an isomer of propylene glycol, offers dramatically better oxidation resistance than cither ethylene glycol or propylene glycol. The D15 standards — D7515, D7517 and D7518 — will help advance the use of PDO in coolant formulations for light, medium and heavy duty automotive engines.

From the early stages of the supply chain, through to manufacturing and assembly operations, and onto the roads and highways throughout the world, ASTM standards arc the building blocks of reliable, durable automobiles that are safe to drive.

In addition to standards for the components and technologies of automobiles, ASTM International committees such as D04 on Road and Paving Materials and E17 on Vehicle - Pavement Systems develop standards for the roads and infrastructure used by automobiles, which are not covered in this overview.

CONCLUSION

This paper briefly outlines the need for Automobile safety both Active as well as passive. It gives a brief insight into the quotation of quality practices adhered to by developed nations in the past and incorporated by the nest of the world now, also the ASTM standards for. Diving quality and safety in the automotive industry has been a part of this paper.

All of these systems are designed to help the passengers of an automobile escape injury during an accident. However, the most important safety feature is an alert and defensive driver. Many accidents can be avoided simply by being aware of one’s surroundings and reacting quickly to changing conditions. Hopefully you will never have to use all of those safety features in your new car, but it is much better to have them there when you really need them than not to have them at all.

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