

ELECTROSTATICS IN THE AUTOMOTIVE INDUSTRY

People ask me a lot “What is ESD”? I mostly reply with another question “Did you ever experienced a shock when you got out of a car”? Everybody has ...

Some people experiences it only as a comfort inconvenient. Other people however have real problems with these discharges. I once met a man who bought the same brand of car as long as he lived. He was satisfied about his previous cars and his father taught him that those were the best and safest car. Last year he bought a new car, but instead of being happy he was disgruntled about it! He never wanted to buy that brand again only because every time he closed the door, he got zapped. Lucky for him (and the OEM), the problem could be solved very easily, fast and for free!

However, comfort is not the only problem caused by electrostatics. The relation between electrostatics and car sickness is well known. You can decrease the possibility of getting car sick by increasing the amount of carbon in your tires (the fact that a car is a cage of Faraday is one of the biggest ESD myths). At the moment, several universities in the United Kingdom and the United States are studying the correlation between headache and nausea and electrostatics.

For more than ten years, accidents are being reported of fires at gas stations caused by electrostatic discharges (ESD). Most of them happened in the States, and I have to admit that



they are a way ahead of the European Community using conductive warning labels, spreading video's of the “Do's and Dont's”,

Two or three years ago, also the European got a “shock” when almost everybody with an e-mail got of movie of a young women causing a fire with an electrostatic discharge. In Belgium, a lot of people were alarmed again after a broadcast of “Hoe Zo!” . And I am surprised that several gas stations in Belgium are putting warn sings at their stations. However, there is no uniformity, people are not informed, and most signs are so indistinct

that people as I have to think several minutes to figure out what the symbol or abbreviation means.

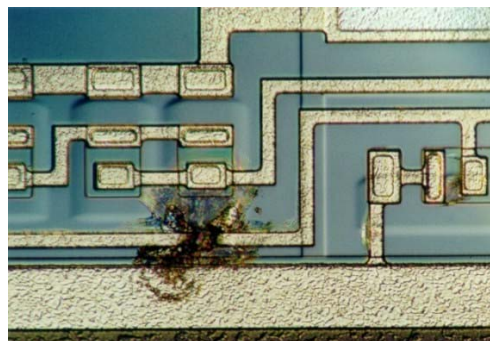
But there is not only explosion hazard at the gas stations. During the last years, several recalls took place caused by static problems such as gas tanks that were to chargeable, static fuel caps, etcetera.

Also components used in cars can explode (during manufacturing). We have knowledge about two exploded airbags during the past six months. Those airbags fired during manufacturing because of electrostatic discharges.

As other factories, also car manufacturers can have explosions at their premises that can be caused by electrostatics. Circa ten percent of the industrial fires in Belgium are caused by static discharges. Now think about the paint shops with flammable fumes at the OEM's and their suppliers!

Did you know that electrostatic discharges causes electromagnetic waves. A couple of years ago, a robot malfunctioned due to electromagnetic interference which was the result of ESD. This accident at an OEM caused not only a lot of damages, but also resulted in a line stop.

Cars are changing fast. Not only materials are changing (e.g. very insulating and static synthetic materials instead of metal), but a lot of functions that used to work through mechanics and/or hydraulic systems are now driven electronically. For some vehicles, more than 50% of the manufacturing cost consist of electronics! I'm not only talking about airco's and electric windows, but also about electric keys etc. Even the brakes of your car are (partially) controlled by electronics! This takes electronics from a "quality" to a safety issue. In the year 2000, 32% of all recall actions in the automotive industry were caused by electronic problems. In 2005, electronic failures caused more than 75% of the recalls! Given the spectacular increase of electronics in vehicles, and the fact that they become safety items (e.g. Brake-By-Wire), the OEM's and their suppliers should handle those components in an ESD safe way! Fortunately several car manufacturers identified this need. A few OEM's even have their own customer specific requirements regarding ESD.



Finally, electrostatics is not always a bad thing. As other industries, also the automotive industry uses electrostatics. Again, think about the paint shops where electrostatics is often applied as a part of the process.

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ElectroStat

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