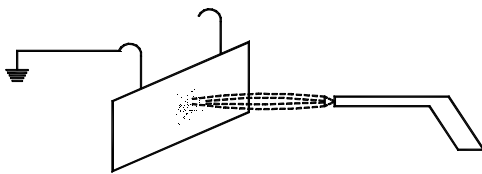


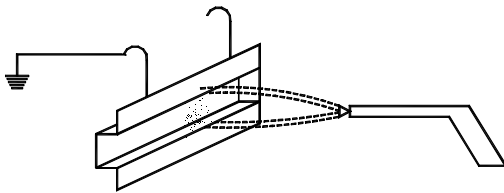
THE FAMOUS FARADAY CAGE EFFECT: AN EXPLANATION

Everybody has heard of 'the faraday cage problem'. Very few people really know what it is. Here we have tried to explain in a layman's language what this so-called Faraday Cage problem is, what causes it and what its effects are. We have not gone into the very technical languages and theories.

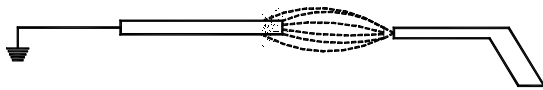
A conventional spray gun has a high voltage electrode built into the spray tube, generally near the powder outlet opening. Once the gun is approximated to the work piece which is obviously grounded / earthed these field lines will go in the direction of the work piece and be concentrated to the nearest point.



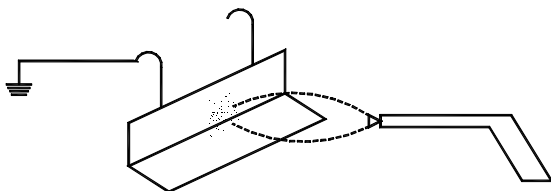
1. On a flat piece the field lines end evenly and concentrate more to the centre than the exterior.



2. On a shaped surfaced the field lines will concentrate at the nearest point as explained earlier. The further away the depending the fewer field lines reaching it.



3. If there are field lines most powder particles will follow these lines (like cars on a road) and become deposited on the piece where the field lines end. This can be seen here. Whoever painted the piece like this has got an extremely uneven coating.



4. Any type of cavity, hole, corner is therefore a faraday cage.

5. The last figure shows a relatively uncomplicated faraday. However, in any position, the gun will always be further away from the corner than the sides. Hence, the inside corners will always be difficult to coat evenly. If one keeps spraying powder the inside corners will eventually get coated. In such a case however the sides will be coated with a very thick coating.
6. Hence we can say that the faraday cage is caused because no field lines end in the inside corners / deepening. This is just partially true. In addition we have an extremely high concentration of field lines around the inside corners/ deepening from which there resulted a neutral zone in the corner, which even will repel the few powder particles reaching the corner.
7. People feel that higher the high voltage of a gun the better will be the charging of the powder particle. This is just part of the truth. From a low high voltage gun with high transfer efficiency a better powder charge can result than from a gun with a high voltage and low transfer efficiency. And higher the voltage, stronger the field lines and worse the faraday cage.
8. So, most users reduce high voltage when coating shaped articles. But this creates the problem of an insufficient charge resulting in excess overspray and powder deposition on surfaces situated under the gun. In case of automatic guns, anyway it will be useless to do so due to their fixed positions.
9. If you take the gun too near the work piece to coat a shaped article or to coat corners and cavities, there will be an over potential of field lines, the voltage will automatically breakdown and the amperage will increase resulting in the problems described in point 8.
10. Do we need field lines?

No Definitely not: field lines are a result of the high voltage electrodes required for charging the powder. The powder adheres to a work piece due to its opposite charging potential, not due to field lines: This is proved by the TRIBO system, which has no high voltage, and hence no field lines. With the TRIBO systems, there are no field lines and hence no faradays cage. This means easier coating of interiors and shaped surface and smoother working because of the charging level remaining constant.