



Battery Contact Considerations

- **Dimensional:** ANSI and IEC industry standard dimensions should be used when designing a battery compartment to avoid battery fit problems.
- **Mechanical Properties:** The material must have enough ductility, should be strong to avoid deformation, should not relax over time, and should resist wear.
- **Electrical Conductivity:** The better the conductivity of the connector the lower the contact resistance will be.
- **Environmental Stability:** It is particular important that the contact material does not corrode, or cause corrosion of the materials that it is in contact with.
- **Cost:** No material is perfect. There are often trade-offs between the aforementioned material considerations.
 - Practical solutions often involve coating a substrate to get an optimum combination of properties. That is, the coating primarily provides the electrical and environmental properties; whereas, the substrate gives most of the mechanical properties, with a possible cost reduction if a relatively cheap material is used.

Plating and Substrates

1. Gold Plating - Provides the most reliable metal-to-metal contact under all environmental conditions.
2. Nickel (Solid) - Provides excellent resistance to environmental corrosion and is second only to gold plating as a contact material. Solid nickel can be easily drawn or formed.
3. Nickel Clad Stainless - Performs almost as well as solid nickel with excellent resistance to corrosion.
4. Nickel-Plated Stainless - A widely used material. Non-plated stainless steel is not recommended due to the adverse impact of passive films, which develop on the surface and result in poor electrical contact.
5. Inconel Alloy - Provides good electrical conductivity and good corrosion resistance. However, soldering may be difficult unless an active flux is used.

Important Notice

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(plating and substrates – continued)

6. Nickel-Plated Cold-Rolled Steel - *An economical contact material that provides a good contact surface for welding and soldering.*
- The connectors used with conventional cylindrical cells are primarily Ni-plated
 - The Ni-plating must be adherent, continuous, non-porous, and resistant to wear. The suggested plating thickness is 200 micro-inches.
 - Avoid Sn-plating for connectors due to possible galvanic corrosion and fretting wear/corrosion.

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