

May 8, 2015

News Release

JX Nippon Mining & Metals Corporation

Development of New Plating Technology hyperTin®

Allows low insertion force, whisker-free plating, and high thermal resistance

JX Nippon Mining & Metals Corporation (president: Shigeru Oi) has developed and begun sample supply of hyperTin®, a new post-plating* technology that achieves lower friction than conventional tin plating, greatly reducing the force needed for connector insertion. It is currently undergoing sample evaluation by customers as preparations are made for the start of mass production. The main features are described below

*Post-plating: Plating applied to strips or foils after stamping.

1. Low insertion force

Today's smart cars, relying more and more on computer intelligence, are equipped with increasingly sophisticated electronic parts. These in turn are linked by connectors having a growing number of pins. This is causing increase in force required to insert the connectors when automobiles are being assembled, which is an issue that needs to be addressed. Using our proprietary patented technology, hyperTin® eliminates the pure tin layer that was a cause of the increased insertion force in conventional tin plating. The male connector (Figure 1) instead is formed from alloy layers of tin-silver and tin-nickel, with less than half the friction coefficient of pure tin, reducing insertion force to around 36% of that required previously (Figure 2).

2. Whisker-free plating

The lack of a pure tin surface layer in hyperTin® eliminates the risk of shorting caused by formation of tin "whiskers" (whisker-shaped single crystals; Figure 3) that is an issue with conventional tin plating. Taking advantage of this feature, it is applicable to connectors with narrower pitch than are possible with conventional tin plating.

3. High thermal resistance

Thanks to the excellent electrical characteristics and solderability of hyperTin®, which maintains its contact resistance in high-temperature environments (Figure 4), it can replace precious metal (gold or silver) plating that has conventionally been used for certain portions of connectors, leading to significant cost savings.

Figure 1 Cross-sectional structure of hyperTin®

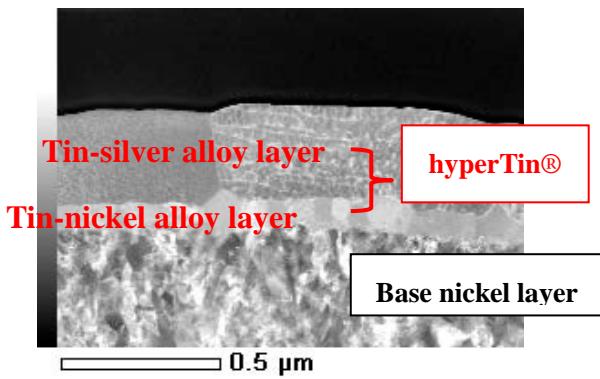
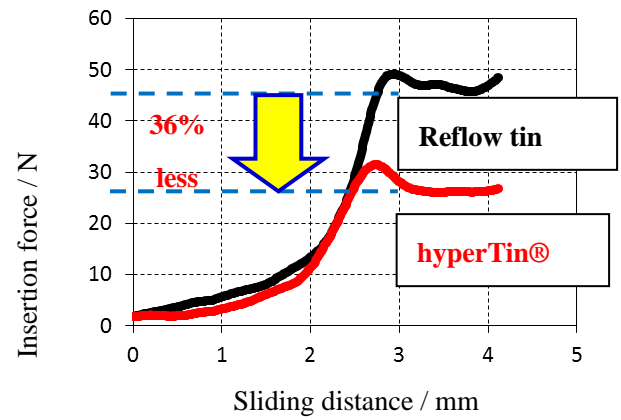


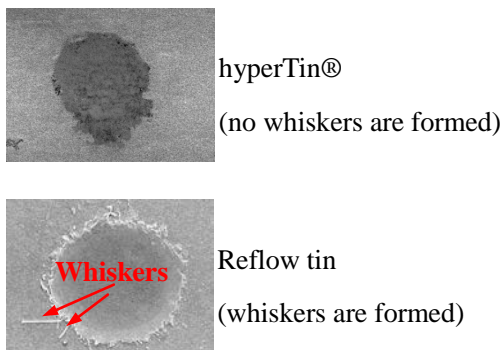
Figure 2. Connector insertion force



*32-pin connector (terminal width 0.64mm)

*Female side uses tin plating

Figure 3. Whisker resistance



*Sphere indentation method, load 2N, duration 120h

Figure 4. Thermal resistance

