# ES-88-L: FINISH SPECIFICATION - MISCELLANEOUS

## 1.0 SCOPE
This specification defines the requirements for all MISCELLANEOUS finishes on metallic surfaces.

## 2.0 PURPOSE
To define the standard finish characteristics and finish codes along with their minimum and maximum layer requirements.

## 3.0 REFERENCE DOCUMENTS
ES-88 Molex Finish Specification.

## 4.0 DEFINITIONS

### 4.1 Finish Specification Codes

#### 4.1.1 #1 Gold Inlay over Nickel Overall

Note: See ES-88 for specific material properties, quality, packaging, etc. details.
Conversion factor 1 µm = 39.37µ inch

| PROCESS CODE | APPEARANCE CODES | FINISH CODE | OVERALL #1 GOLD INLAY MIN µin (µm) MAX µin (µm) | OVERALL NICKEL MIN µin (µm) MAX µin (µm) | OBSOLETE/ RECOMMENDED |
|---|---|---|---|---|---|
| I | | 590 | 15 (0.38) | 50 (1.27) | OBSOLETE |

UNLESS OTHERWISE SPECIFIED MAXIMUM FINISH THICKNESS ALLOWED ABOVE MINIMUMS:

Continuous and batch plating:

| | | |
|---|---|---|
| Nickel | Continuous plating | 50µ" (1.27µm) |
| | Batch plating | 50µ" (1.27µm) |
| Gold | Continuous plating | 10µ" (0.25µm) |
| | Batch plating | 20µ" (0.51µm) |

### 4.1.2 #1 Gold Inlay with Selective 60/40 Tin Lead Alloy over Nickel Overall

Note: See ES-88 for specific material properties, quality, packaging, etc. details.
Conversion factor 1 µm = 39.37µ inch

| PROCESS CODE | APPEARANCE CODES | FINISH CODE | SELECT #1 GOLD INLAY MIN µin (µm) MAX µin (µm) | SELECT 60/40 TIN LEAD MIN µin (µm) MAX µin (µm) | OVERALL NICKEL MIN µin (µm) MAX µin µm) | OBSOLETE/ RECOMMENDED |
|---|---|---|---|---|---|---|
| I | M | 552 | 30 (0.76) | 200 (5.08) | 50 (1.27) | OBSOLETE |

UNLESS OTHERWISE SPECIFIED MAXIMUM FINISH THICKNESS ALLOWED ABOVE MINIMUMS:

Continuous and batch plating:

| | | |
|---|---|---|
| Nickel | Continuous plating | 50µ" (1.27µm) |
| | Batch plating | 50µ" (1.27µm) |
| Tin-Lead Alloy | Continuous plating | 75µ" (1.91µm) |
| | Batch plating | 250µ" (6.35µm) |
| Gold | Continuous plating | 10µ" (0.25µm) |
| | Batch plating | 20µ" (0.51µm) |

### 4.1.3 Selective hard Gold with Selective 60/40 Tin Lead Alloy over Selective Nickel

Note: See ES-88 for specific material properties, quality, packaging, etc. details.
Conversion factor 1 µm = 39.37µ inch

| PROCESS CODE | APPEARANCE CODES | FINISH CODE | SELECT HARD GOLD IMIN µin (µm) MAX µin (µm) | SELECT 60/40 TIN LEAD ALLOY MIN µin (µm) MAX µin (µm) | SELECT NICKEL MIN µin (µm) MAX µin (µm) | OBSOLETE/ RECOMMENDED |
|---|---|---|---|---|---|---|
| | M | 613 | 30 (0.76) | 15 (0.38)<br>50 (1.27) | 50 (1.27) | |

UNLESS OTHERWISE SPECIFIED MAXIMUM FINISH THICKNESS ALLOWED ABOVE MINIMUMS:

Continuous and batch plating:

| | | |
|---|---|---|
| Nickel | Continuous plating | 50µ" (1.27µm) |
| | Batch plating | 50µ" (1.27µm) |
| Tin-Lead Alloy | Continuous plating | 75µ" (1.91µm) |
| | Batch plating | 250µ" (6.35µm) |
| Gold | Continuous plating | 10µ" (0.25µm) |
| | Batch plating | 20µ" (0.51µm) |

### 4.1.4 Selective hard Gold with Selective 90/10 Tin Lead Alloy over Selective Nickel

Note: See ES-88 for specific material properties, quality, packaging, etc. details.
Conversion factor 1 µm = 39.37µ inch

| PROCESS CODE | APPEARANCE CODES | FINISH CODE | SELECT HARD GOLD MIN µin (µm) MAX µin (µm) | SELECT 90/10 TIN LEAD ALLOY MIN µin (µm) MAX µin (µm) | SELECT NICKEL MIN µin (µm) MAX µin µm) | SELECT NICKEL MIN µin (µm) MAX µin µm) | OBSOLETE/ RECOMMENDED |
|---|---|---|---|---|---|---|---|
| | | 612 | 30 (0.76) | 100 (2.54)<br>300 (7.62) | 50 (1.27) | | |
| | | 922 | 50(1.27) | 35 (0.89)<br>75 (1.91) | 50 (1.27) | 30 (0.76)<br>60 (1.52) | |

UNLESS OTHERWISE SPECIFIED MAXIMUM FINISH THICKNESS ALLOWED ABOVE MINIMUMS:

Continuous and batch plating:

| | | |
|---|---|---|
| Nickel | Continuous plating | 50µ" (1.27µm) |
| | Batch plating | 50µ" (1.27µm) |
| Tin-Lead Alloy | Continuous plating | 75µ" (1.91µm) |
| | Batch plating | 250µ" (6.35µm) |
| Gold | Continuous plating | 10µ" (0.25µm) |
| | Batch plating | 20µ" (0.51µm) |

### 4.1.5 Selective hard Gold with Selective Hard Gold Flash over Selective 60/40 Tin Lead Alloy with Selective Nickel

Note: See ES-88 for specific material properties, quality, packaging, etc. details.
Conversion factor 1 µm = 39.37µ inch

| PROCESS CODE | FINISH CODE | SELECT HARD GOLD MIN µin (µm) MAX µin (µm) | SELECT HARD GOLD FLASH MIN µin (µm) MAX µin (µm) | SELECT 60/40 TIN LEAD ALLOY MIN µin (µm) MAX µin (µm) | SELECT NICKEL MIN µin (µm) MAX µin µm) | SELECT NICKEL MIN µin (µm) MAX µin µm) | OBSOLETE/ RECOMMENDED |
|---|---|---|---|---|---|---|---|
| | 510 | 30 (0.76) | 2 (0.05)<br>10 (0.25) | 15 (0.38)<br>60 (1.52) | 50 (1.27) | 30 (0.76)<br>60 (1.52) | |

UNLESS OTHERWISE SPECIFIED MAXIMUM FINISH THICKNESS ALLOWED ABOVE MINIMUMS:

Continuous and batch plating:

| | | |
|---|---|---|
| Nickel | Continuous plating | 50µ" (1.27µm) |
| | Batch plating | 50µ" (1.27µm) |
| Tin-Lead Alloy | Continuous plating | 75µ" (1.91µm) |
| | Batch plating | 250µ" (6.35µm) |
| Gold | Continuous plating | 10µ" (0.25µm) |
| | Batch plating | 20µ" (0.51µm) |

### 4.1.5 Selective hard Gold with Selective Hard Gold Flash over Selective 90/10 Tin Lead Alloy with Selective Nickel

Note: See ES-88 for specific material properties, quality, packaging, etc. details.
Conversion factor 1 µm = 39.37µ inch

| PROCESS CODE | FINISH CODE | SELECT HARD GOLD MIN µin (µm) MAX µin (µm) | SELECT HARD GOLD FLASH MIN µin (µm) MAX µin (µm) | SELECT 90/10 TIN LEAD ALLOY MIN µin (µm) MAX µin (µm) | SELECT NICKEL MIN µin (µm) MAX µin µm) | SELECT NICKEL MIN µin (µm) MAX µin µm) | OBSOLETE/ RECOMMENDED |
|---|---|---|---|---|---|---|---|
| | 527 | 30 (0.76) | 2 (0.05)<br>10 (0.25) | 15 (0.38)<br>60 (1.52) | 50 (1.27) | 30 (0.76)<br>60 (1.52) | |
| | 530 | 30 (0.76) | 2 (0.05)<br>10 (0.25) | 35 (0.89)<br>75 (1.91) | 50 (1.27) | 30 (0.76)<br>60 (1.52) | |

UNLESS OTHERWISE SPECIFIED MAXIMUM FINISH THICKNESS ALLOWED ABOVE MINIMUMS:

Continuous and batch plating:

| | | |
|---|---|---|
| Nickel | Continuous plating | 50µ" (1.27µm) |
| | Batch plating | 50µ" (1.27µm) |
| Tin-Lead Alloy | Continuous plating | 75µ" (1.91µm) |
| | Batch plating | 250µ" (6.35µm) |
| Gold | Continuous plating | 10µ" (0.25µm) |
| | Batch plating | 20µ" (0.51µm) |