

## LOW EXPANSION ALLOYS

### **42 ALLOY (ASTM F30)**

Binary Alloy with low thermal expansion coefficient.  
Used on: Leadframes for integrated circuits, thermostatic bi-metal strips  
and glass to metal seals.

#### ALLOY 42 PHYSICAL PROPERTIES

|   |       |
|---|-------|
| SPECIFIC GRAVITY                        | 8.12  |
| DENSITY, lbs. per cu. in.               | 0.293 |
| ELECTRICAL RESISTIVITY,<br>MICRO-OHM-CM | 72    |

#### 42 ALLOY TYPICAL NOMINAL CHEMISTRY

|                |         |
|----------------|---------|
| NICKEL (NI)    | 39/41   |
| CHROMIUM (CR)  | 0.05    |
| MANGANESE (MN) | 0.60    |
| SILICON (SI)   | 0.02    |
| CARBON (C)     | 0.05    |
| ALUMINUM (AL)  | 0.02    |
| COBALT (CO)    | 0.05    |
| PHOSPHORUS (P) | 0.02    |
| SULFUR (S)     | 0.02    |
| IRON (FE)      | BALANCE |

Note: Nickel varies to achieve the proper thermal expansion.

#### 42 ALLOY TYPICAL TENSILE STRENGTH (1,000 PSI)

|          |                    |
|----------|--------------------|
| ANNEALED | 85,000 MAX.        |
| ¼ HARD   | 90,000 to 115,000  |
| ½ HARD   | 105,000 to 125,000 |
| HARD     | 120,000 MIN.       |

**TYPICAL HARDNESS, ROCKWELL B**

|          |          |
|----------|----------|
| ANNEALED | 70 MAX.  |
| ¼ HARD   | 78 to 83 |
| ½ HARD   | 84 to 88 |

**TYPICAL LINEAR COEFFICIENT OF THERMAL EXPANSION**

(CM. PER CM. C x 10 – 6)

|            |      |
|------------|------|
| 30 TO 100  | 4.8  |
| 30 to 200  | 4.5  |
| 30 to 300  | 4.5  |
| 30 to 350  | 5.0  |
| 30 to 400  | 6.0  |
| 30 to 425  | N/A  |
| 30 to 450  | 7.0  |
| 30 to 500  | 8.0  |
| 30 to 550  | 8.8  |
| 30 to 600  | 9.5  |
| 30 to 700  | 10.5 |
| 30 to 800  | 11.4 |
| 30 to 900  | 12.3 |
| 30 to 1000 | 13.2 |