MATERION

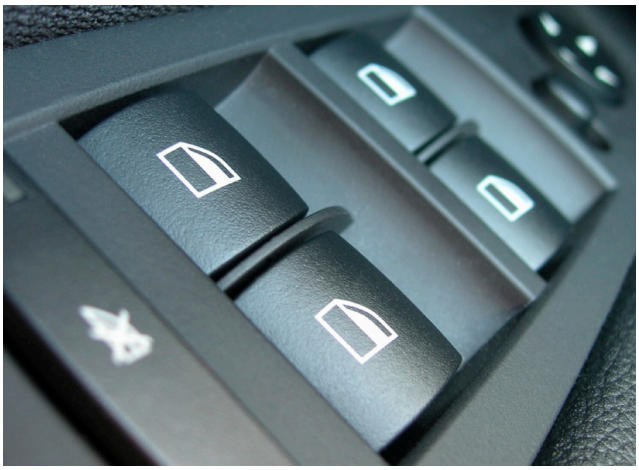
# Automotive Switches & Relays

BRUSH
PERFORMANCE
ALLOYS

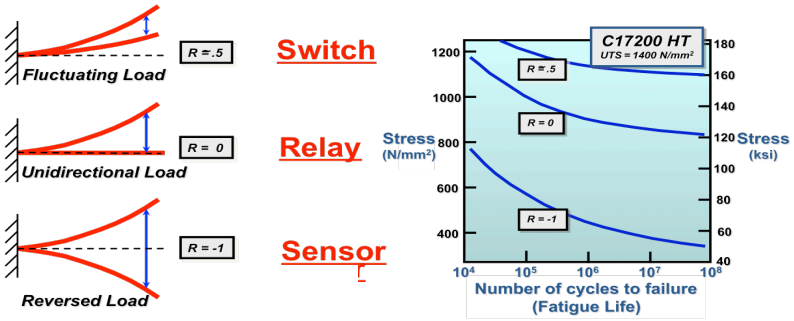
MATERION

Materion Brush Performance Alloys' products provide a cost efficient solution for automotive applications requiring the highest reliability at material performance levels beyond the capability of other copper alloys.

# Automotive Switches and Relays



Materion Brush Performance Alloys' copper alloys provide the longest life in cyclic loading applications, and they have the highest fatigue strength of any copper alloy.




Brush Performance Alloys' copper alloy conductivity can be up to 60% of pure copper.

| Brush Alloy | Conductivity (%IACS) | Resistivity (μΩ • cm) | Tensile Strength (N/mm²) | Fatigue Strength (N/mm², $10^8$, R=-1) | Hardness (HV) |
|---|---|---|---|---|---|
| Brush 60 | 45-50 | 3.6 | 790-970 | 300 | 220-290 |
| Alloy 174 | 45-60 | 3.1 | 650-900 | 340 | 180-280 |
| Alloy 290 | 17-20 | 9.1 | 960-1200 | 400 | 285-430 |
| Alloy 390 | 45-55 | 3.4 | 950-1090 | 270 | 280-340 |

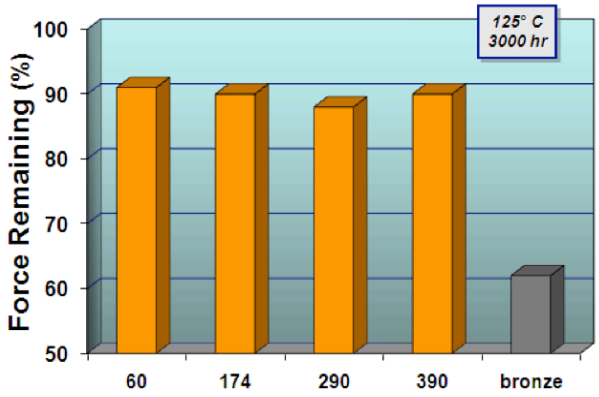
## Design Requirements:

- Thousands to millions of activation cycles
- Consistent performance over ten+ year vehicle life
- Low temperature rise in power applications
- Allow for consistent performance in miniaturized designs

## Contact Alloy Property to Meet Design Requirements:

- High fatigue strength
- High electrical conductivity
- Resistance to stress relaxation
- Resistance to permanent deformation
- Bend formability

Brush Performance Alloys' copper alloys provide stability by minimizing loss in contact force from stress relaxation at elevated temperature.

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