



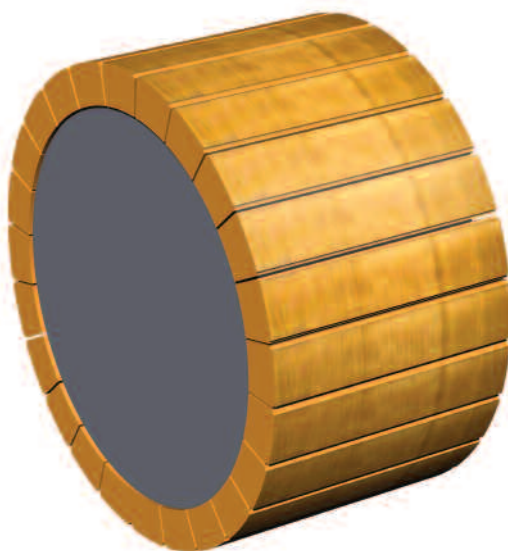
Commutator Troubleshooting

Problems • Causes

Acceptable Commutator Film

Light Film

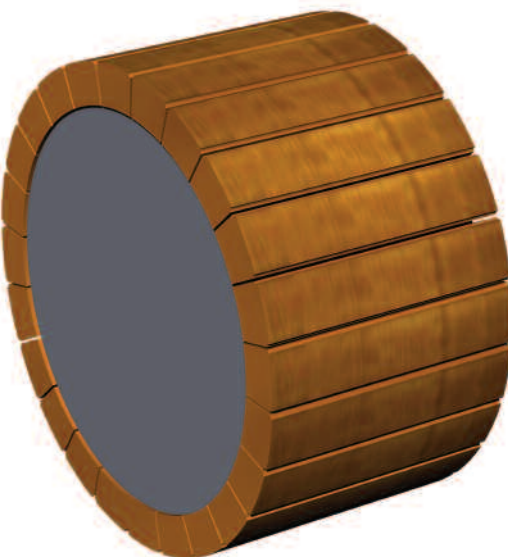
Possible causes are low humidity, low temperatures, light current loads and wrong brush grade. Light Film is considered acceptable providing film does not decline to point of copper dusting.



Good Film Coverage

How a Commutator should look

When a machine runs well, the patina/film or skin on a commutator will be even, slightly shiny and coppery brown to dark brown in color.

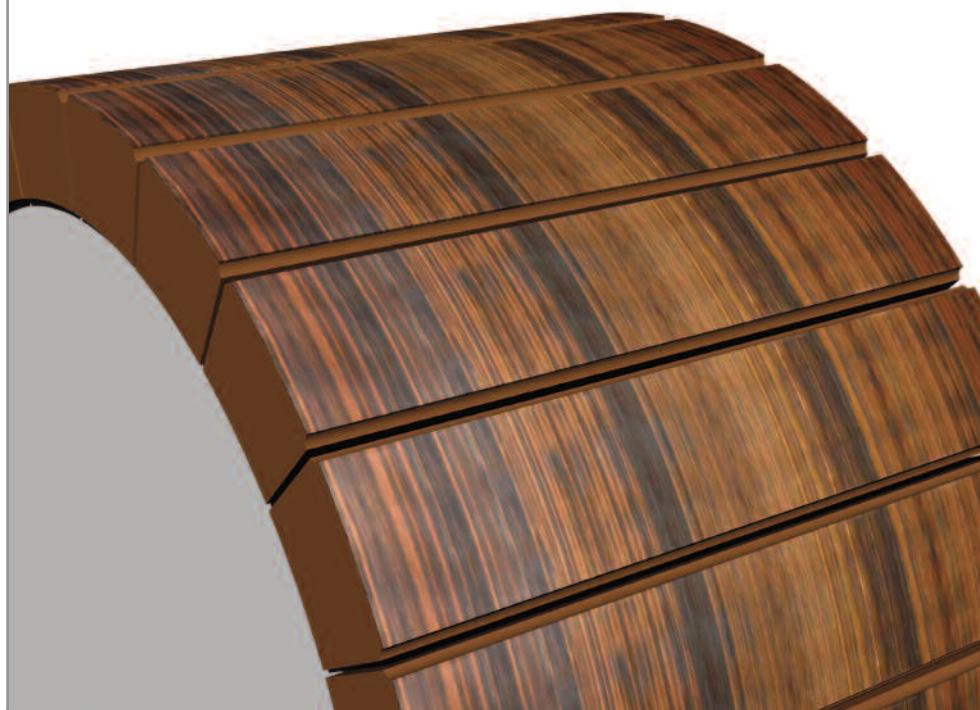


Heavy Film

Results from high load, high humidity or heavy filming rate grades. Colors not in the brown tones indicate contamination resulting in high friction and high resistance.



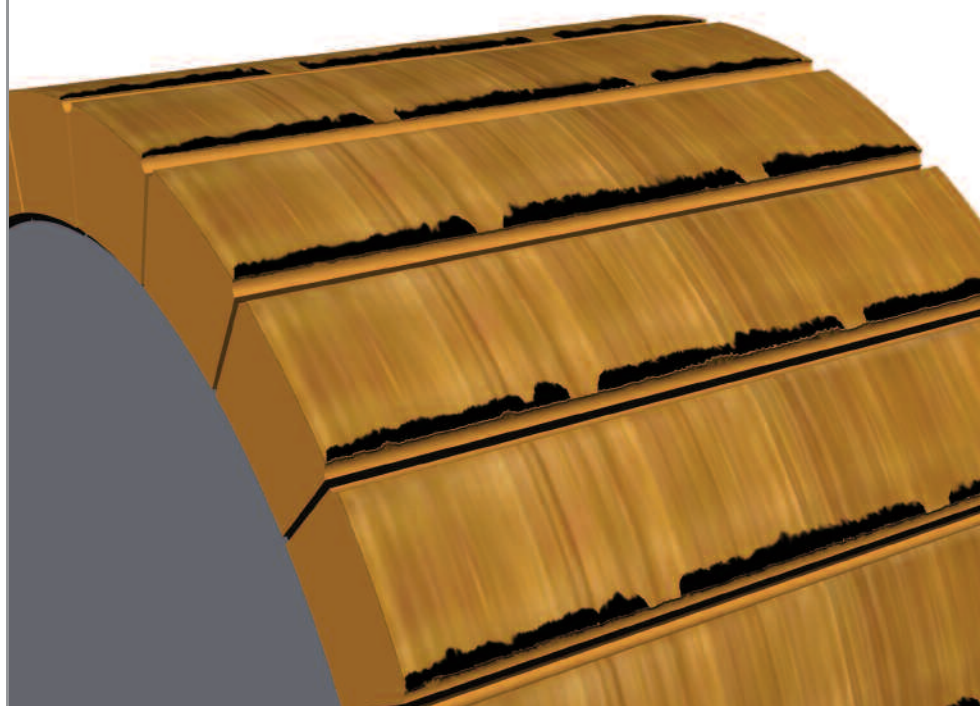
Streaking



Causes

- Light or unequal spring tension
- Light current loads
- Contaminated atmosphere
- Incorrect brush alignment / off neutral
- High humidity
- Oil vapor
- Uneven current distribution
- Copper particle pickup from a raw commutator

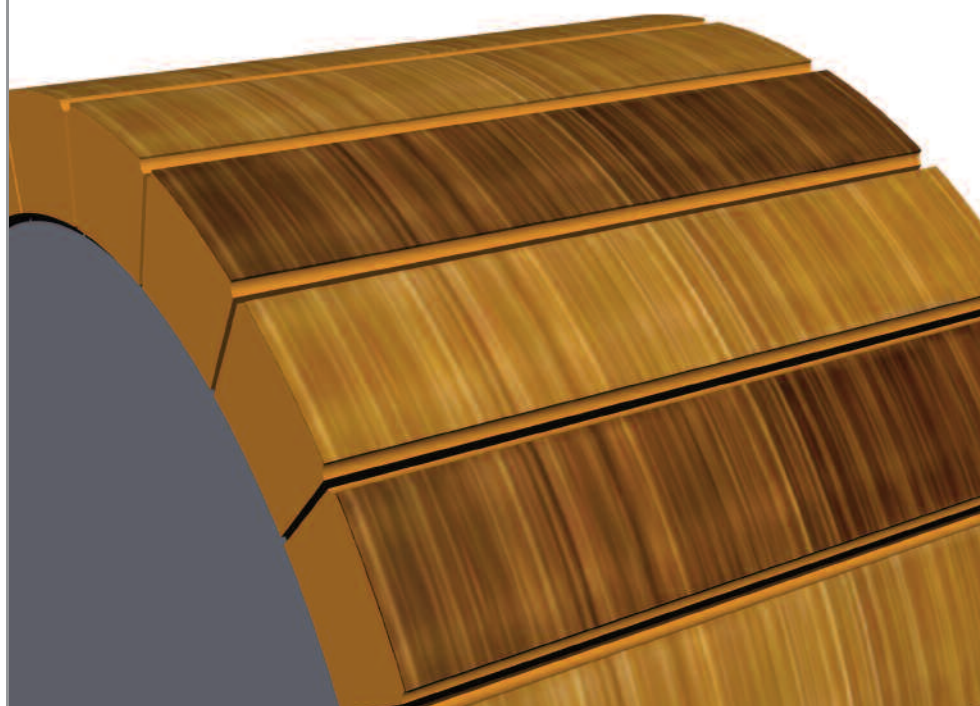
Bar Edge Burning



Causes

- Light or unequal spring tension
- Incorrect brush alignment / off neutral
- Wrong brush grade
- Sparking caused by commutation problems

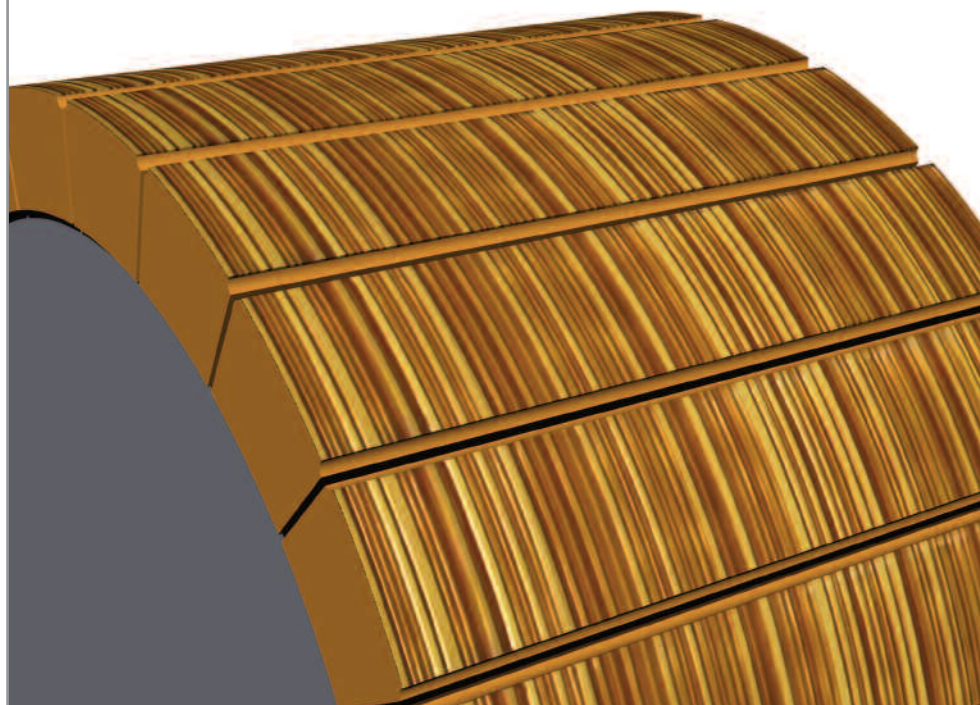
Slot Bar Marking



Causes

- Uneven current distribution
- The unequal number of windings in adjacent slots account for the variation of film color
- This is not considered a problem unless some bars become burnt
- Double windings cross-ing in the same slot

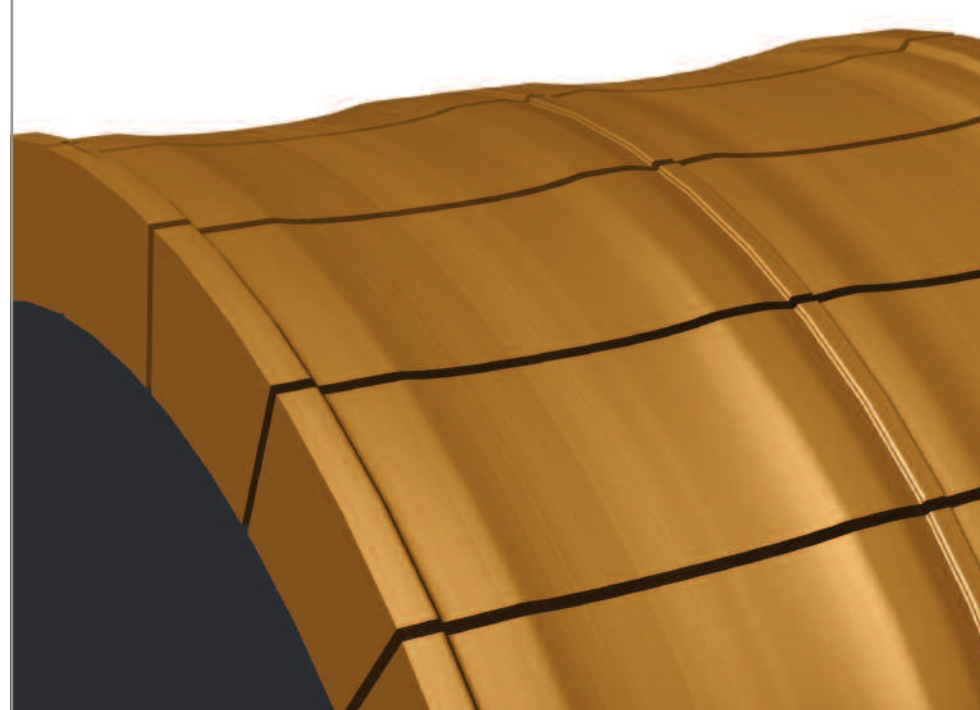
Threading



Causes

- Light or unequal spring tension
- Light current loads
- Contaminated atmosphere
- High humidity
- Oil vapor
- Uneven current distribution
- Conditions have been maintained for a long period of time and caused commutator damage

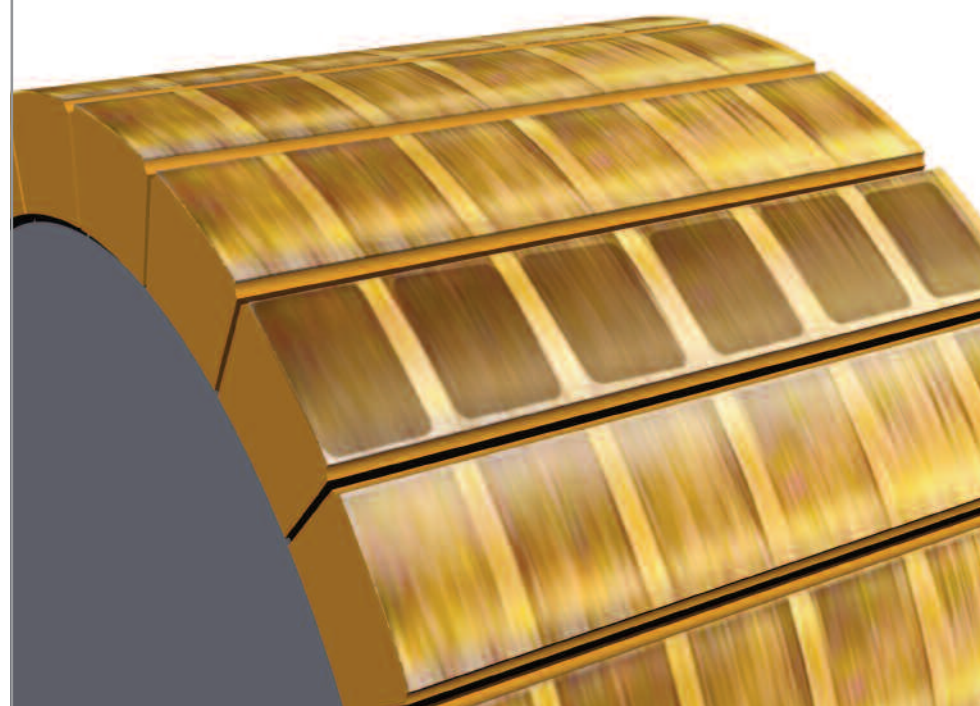
Grooving



Causes

- Light or unequal spring tension
- Contaminated atmosphere
- Incorrect brush alignment / off neutral
- Low humidity and temperature
- Wrong brush grade

Photographing



Causes

- High humidity
- High resistance spot at the same point of rotation
- Mechanical problem that causes a jolt on the brushes and interruption of contact or electrical spike at same point in rotation

Copper Drag



Causes

- Light or unequal spring tension
- Excess vibration
- Wrong brush grade
- Commutator becomes overheated and softened

**Call Helwig's Expert
Technical Services Staff**

800-962-4851

Helwig Carbon Products, Inc.

8900 West Tower Avenue • Milwaukee, WI 53224
800.962.4851 Fax 800.365.3113 www.helwigcarbon.com