

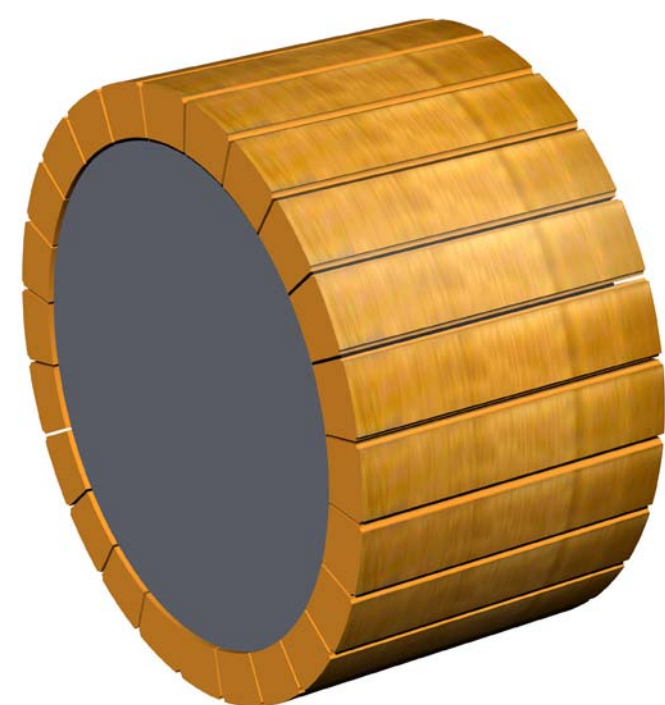


Commutator Conditions Problems and Causes

Acceptable Commutator Film

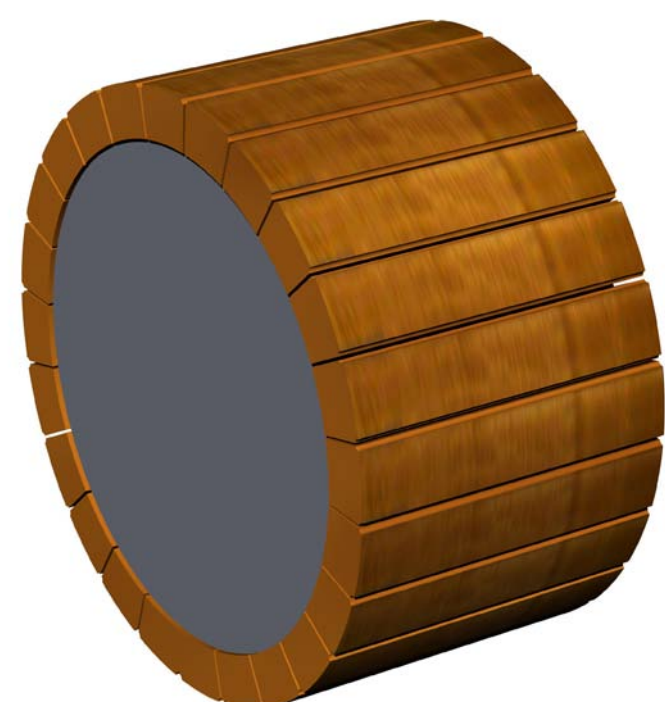
Light Film

Indicates good brush performance. Lighter color results from light current loads, low humidity conditions, film-reducing contamination, or brush grades with low filming rates.



Medium Film

Ideal commutator condition for maximum brush and commutator life. The film will be even and the color is coppery brown to dark brown.

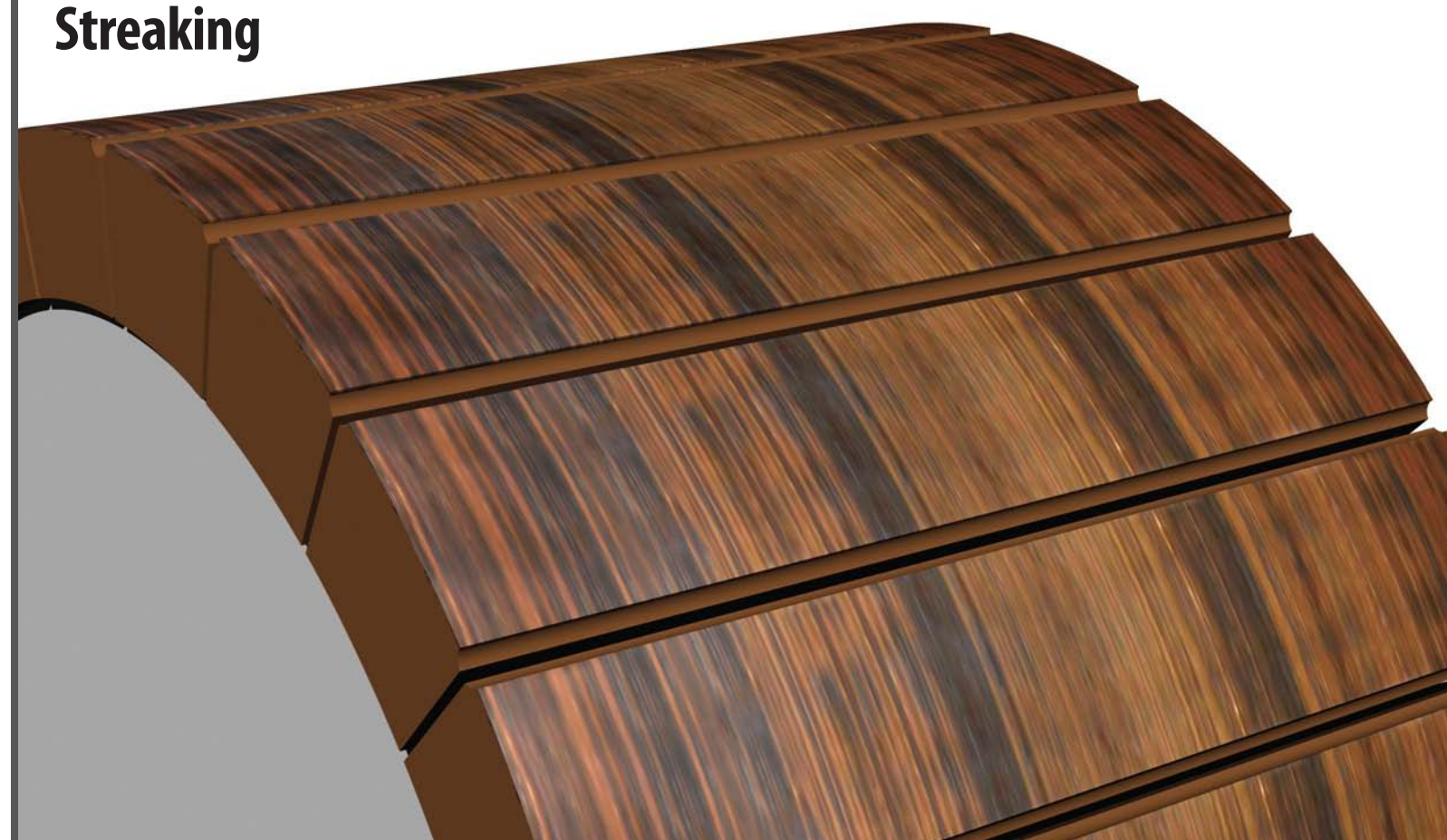


Heavy Film

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



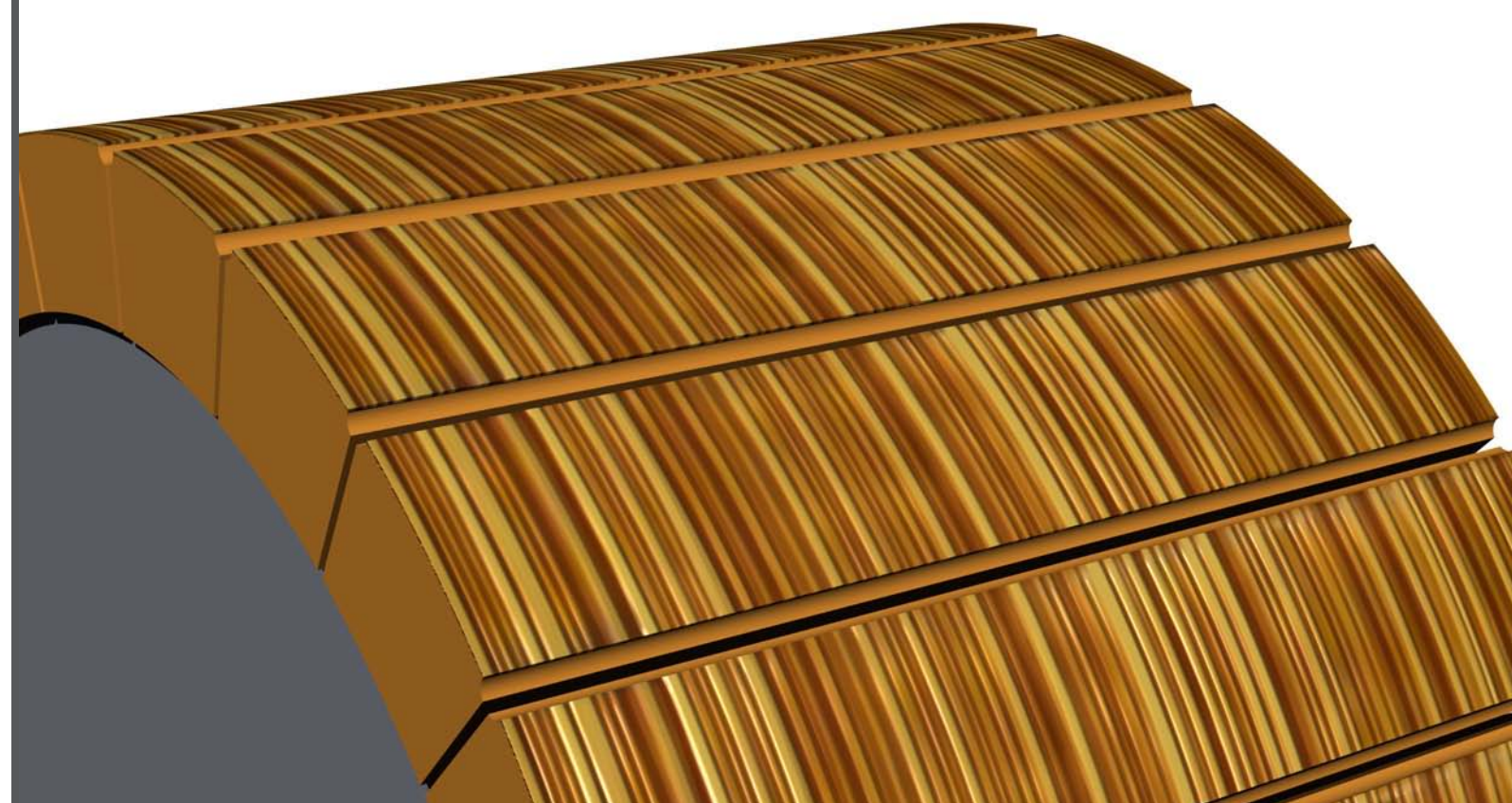
Streaking



Causes

- Low spring pressure
- Low current loads
- Contaminated atmosphere
- High humidity
- Copper particle pickup from commutator

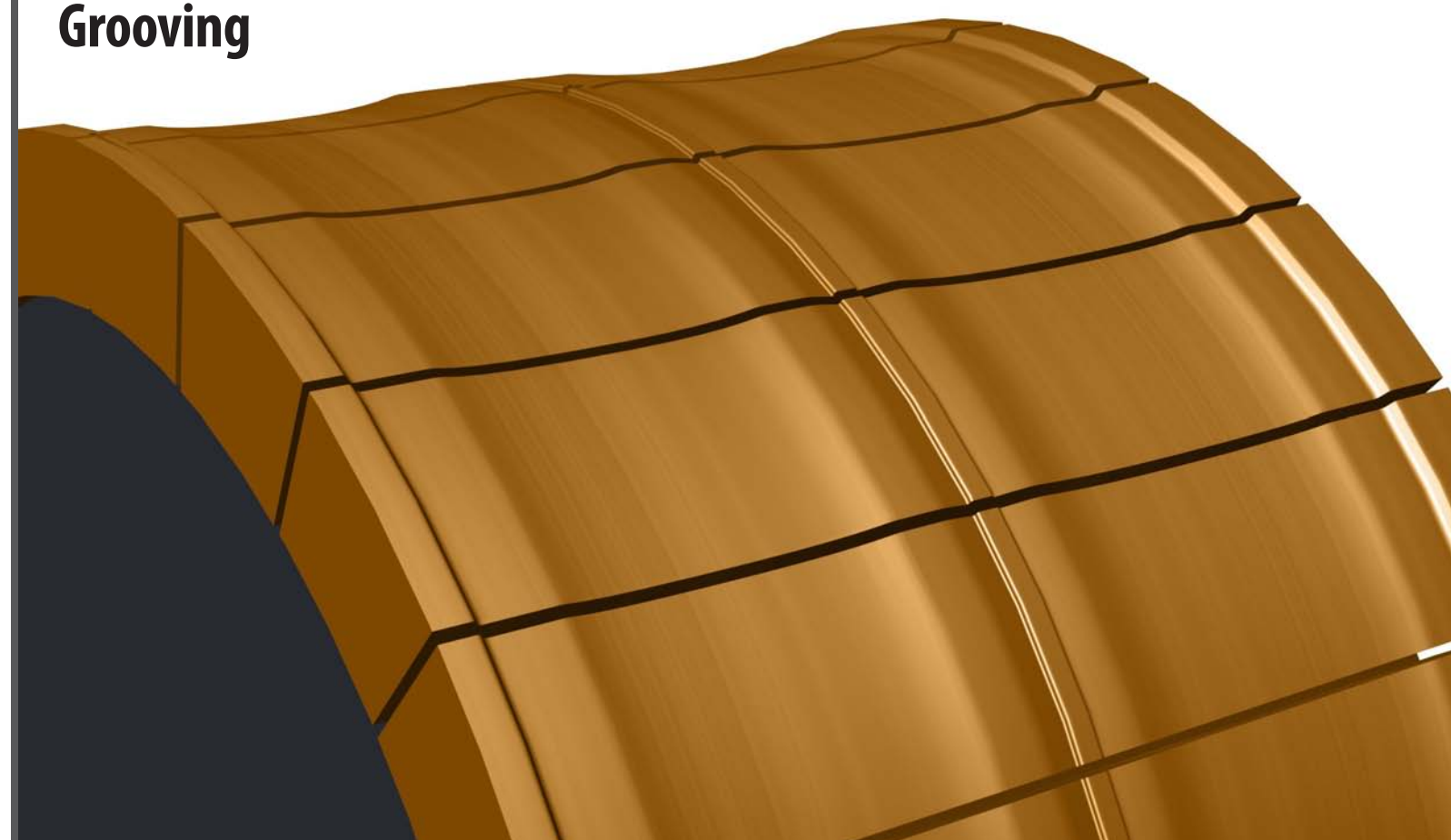
Threading



Causes

- Commutator damage from long term streaking conditions
- Low spring pressure
- Low current loads
- Contaminated atmosphere
- High humidity

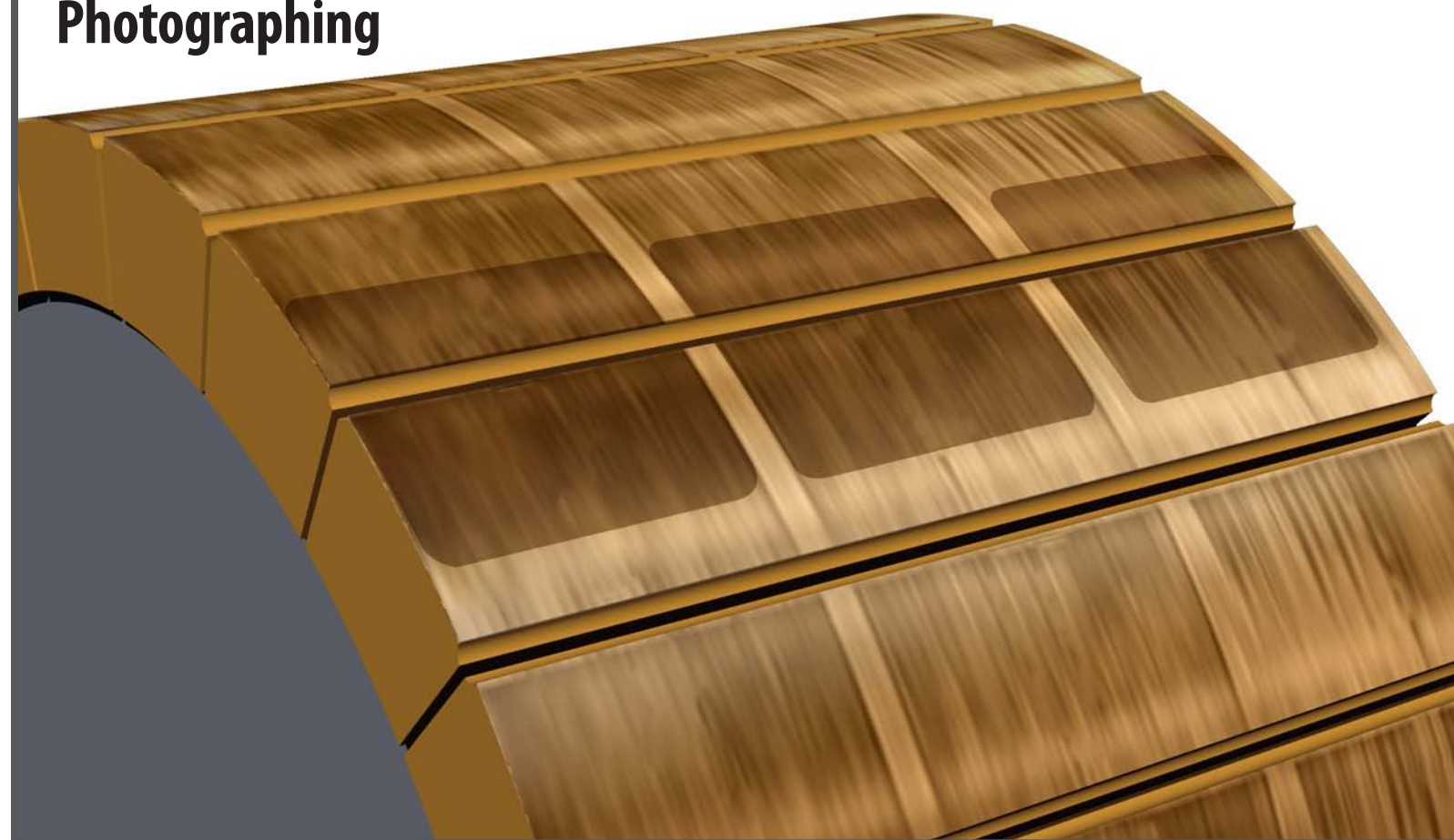
Grooving



Causes

- Arcing due to low spring pressure
- Abrasive brush grades
- Vibration
- Contaminated atmosphere
- Low humidity and temperature

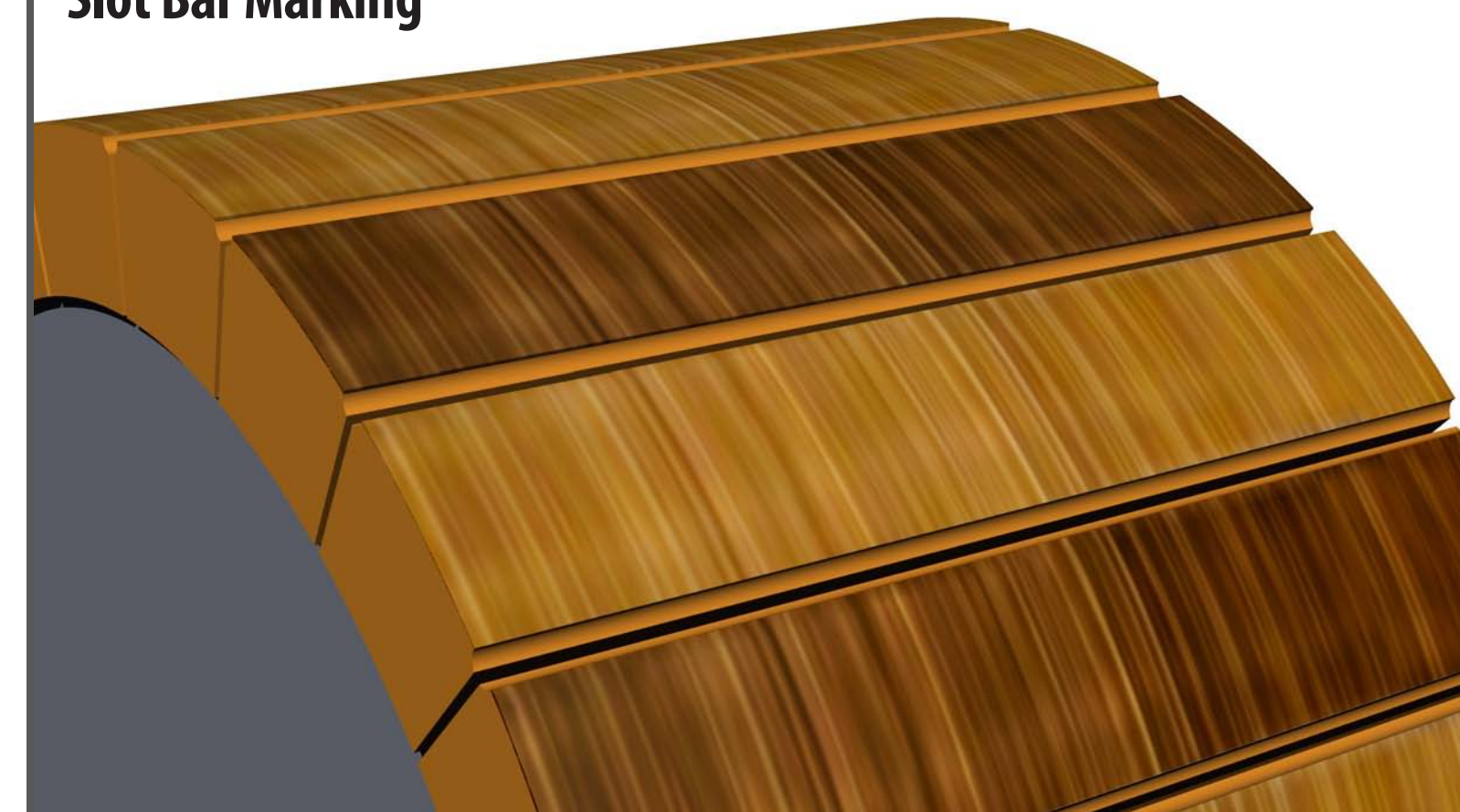
Photographing



Causes

- Condensation under brush face from extended shutdown time
- A jolt on the brushes and interruption of contact or electrical spike at the same point in rotation

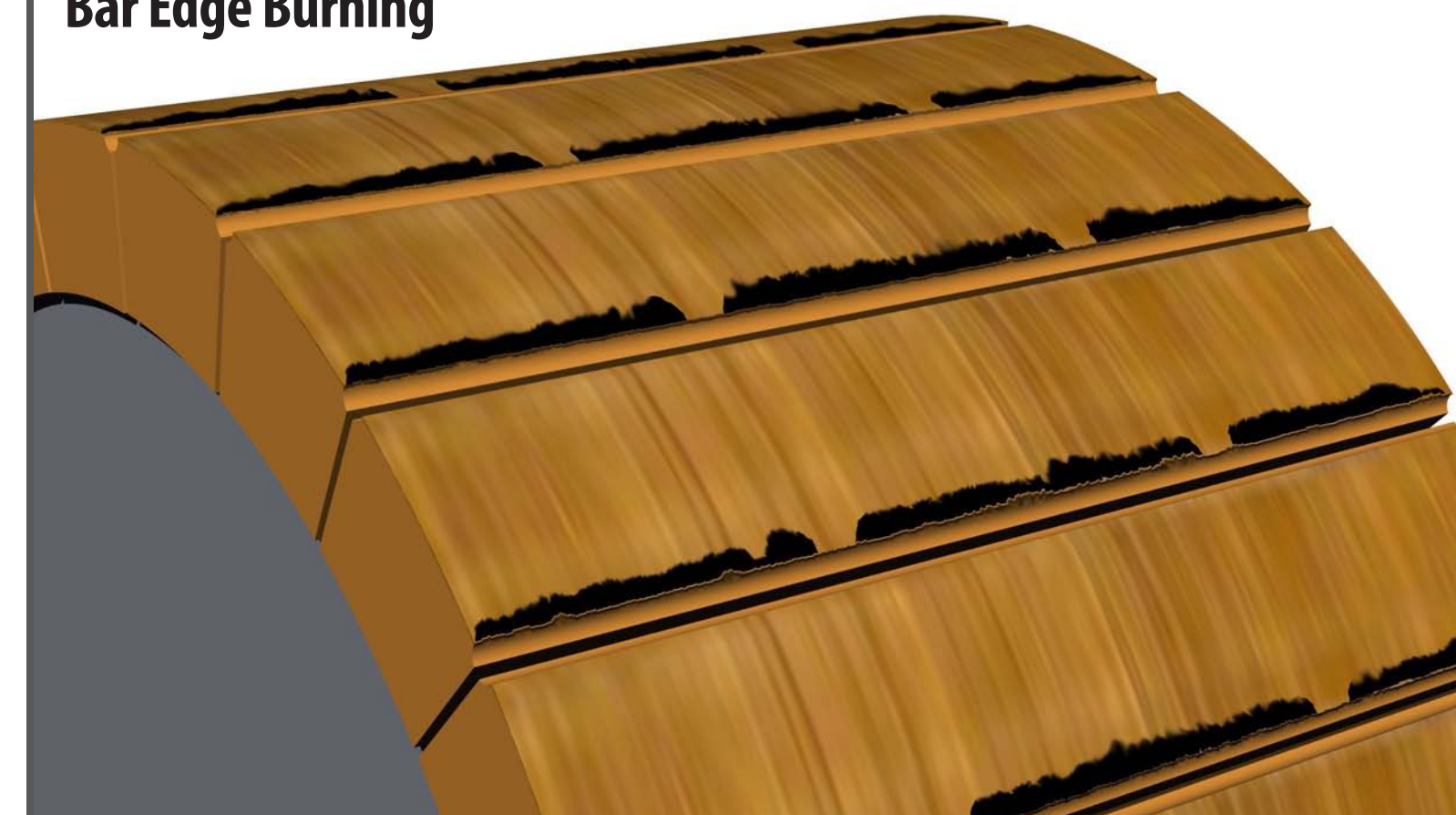
Slot Bar Marking



Causes

- Uneven current distribution in armature windings
- Unequal number of windings in adjacent slots
- Inconsistency in armature windings related to number of coils, slots, and commutator bars

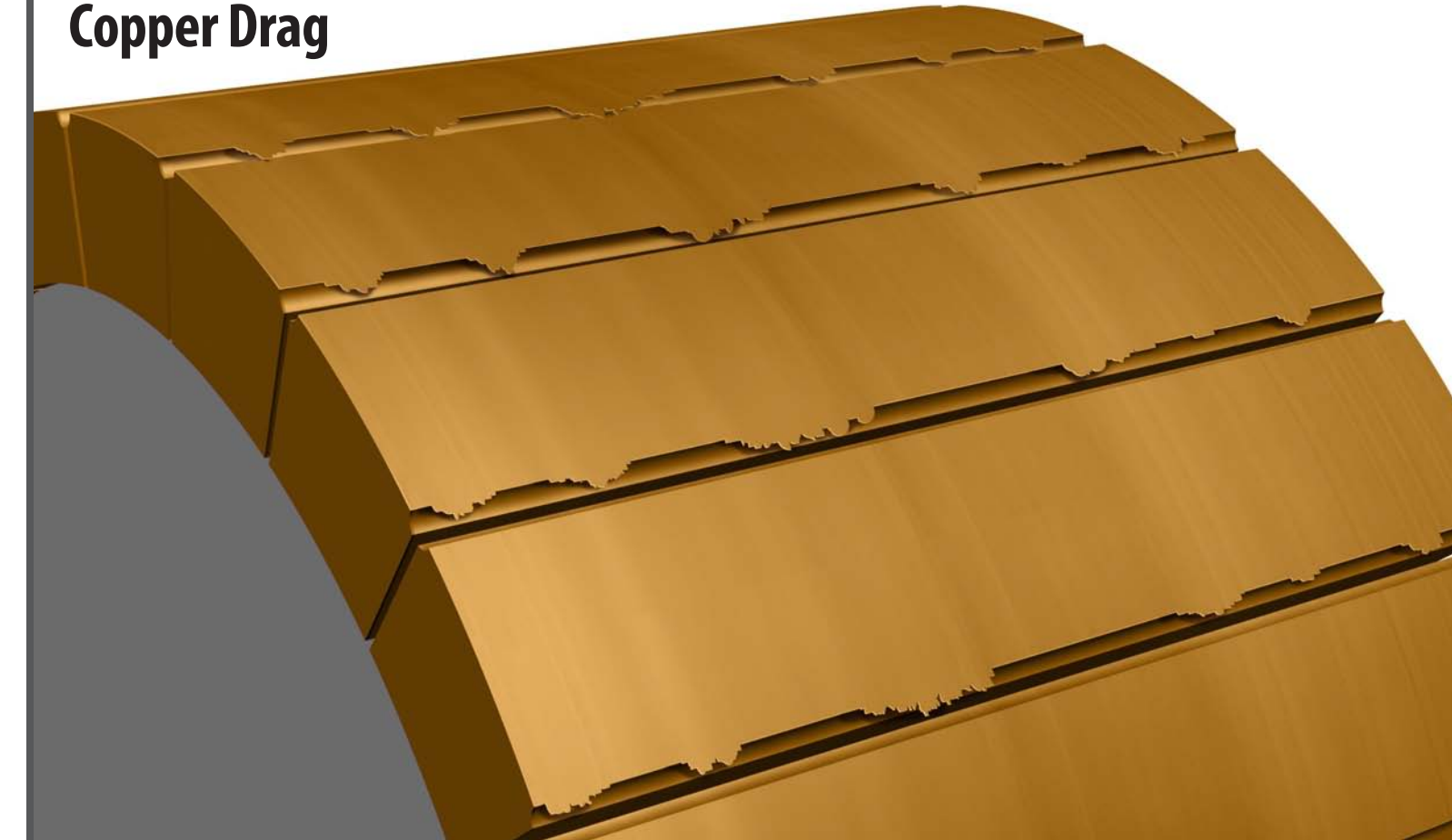
Bar Edge Burning



Causes

- Incorrect brush alignment/off neutral
- Incorrect interpole strength
- Inappropriate brush grade
- Low spring pressure
- Sparking caused by commutation problems

Copper Drag



Causes

- Overheating and softening of the commutator
- Low spring pressure
- High friction brush grades
- Excessive vibration

Call Helwig's Expert
Technical Services Staff

888-353-3190

Helwig Carbon Products, Inc.

8900 W. Tower Ave • Milwaukee, WI 53224 • Fax: 800.365.3113

www.helwigcarbon.com