



## White Paper-1

January 2008

### *Proper Brush Design significantly improves Life and Performance*

#### Situation:

Helwig Carbon's Engineering group was recently approached by a motor manufacturer who was experiencing excess commutator wear and fast carbon brush wear with their 20 Volt DC Fractional Horse Power (FHP) Motor using grade 5106 from another source.

#### Analysis:

Helwig's Team analyzed the brush design thoroughly. A stronger and more flexible wire construction was proposed along with a new carbon material. R&D engineers at Helwig developed a new grade specifically suited for the application. Grade K115 with optimum (35% Copper & 65% Graphite) was developed.

#### Life Tests:

Motors were tested by the customer and an engineering audit was performed after 100 hrs and 250 hrs before completing the life tests.

#### Results:

- 50% less carbon brush wear with the K115 Helwig Carbon brush than the original 5106 grade brush.
- 50% less commutator wear with K115 compared to the 5106.

#### Additional benefits:

The end customer of this motor manufacturer was concerned about the noise being a factor. The new K115 carbon brushes from Helwig Carbon ran with 5% less noise than the original.

*In addition to performance improvements, Helwig brush was more economical as well!!!*

Note- Helwig Carbon has a comprehensive motor test lab including a Dynamometer, R&D Dept, Application and Design engineering group.

For more information contact us directly at 800-962-4851 or visit our website at: [www.helwigcarbon.com](http://www.helwigcarbon.com).

–Nitin Kulkarni  
Engineering Manager