

Carbon brushes for fractional motors

Application Recommendation

Type of Machine	Operating Voltage V	Commutator Segment Insulation	Grade	Standard Values		Remarks
				Allowed Peripheral Speed m/s	Max. Constant Current Density A/cm ²	
Accumulator Motor	3 - 24	undercut	-A41-		25	
Battery Motor	3 - 24	undercut	-A43-		25	
	3 - 24	undercut	-A44-		25	
	3 - 24	undercut	-A47-		25	
	3 - 12	undercut	-A53-		25	
	3 - 12	undercut	-A55-		25	
	24 - 36	vertieft	-A62-		25	
Angle Grinder	230	undercut	-L26-	50	10	
	100/230	undercut	-L28-	50	16	
with and without electronics	48/100/230	undercut	-L41-	40	20	
	100/230	undercut	-L42-	40	16	
	230	undercut	-L45-	50	14	
	100/230	undercut	-L48-	50	14	
	230	undercut	-L53-	50	10	
	48/72	undercut	-L71-	30	20	
	100/230	undercut	-L82-	50	16	
	230	undercut	-L84-	50	10	
	230	undercut	-L85-	50	12	
	100/230	undercut	-L87-	50	14	
	230	undercut	-G40-	60	10	
	100/230	undercut	-HK12-	40	20	
	100/230	undercut	-HP3221-	40	18	
	100/230	undercut	-HP3223-	40	18	
	230	undercut	-HG29-	50	14	
Chain Saw	230	undercut	-L55-	50	14	
	100/230	undercut	-L82-	50	16	
	230	undercut	-HG22-	60	16	
	100/230	undercut	-HP3221-	40	18	

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				Allowed Peripheral Speed m/s	Max. Constant Current Density A/cm ²	
Circular Saw	230	undercut	-L25-	50	10	
Planer	230	undercut	-L26-	50	10	
Belt Sander	100/230	undercut	-L28-	50	16	
Router	48/72/230	undercut	-L41-	40	20	
Jig Saw	100/230	undercut	-L42-	40	16	
with and without electronics	230	undercut	-L53-	50	10	
	48/72	undercut	-L71-	30	20	
	100/230	undercut	-L82-	50	16	
	230	undercut	-L84-	50	10	
	230	undercut	-L85-	50	12	
	230	undercut	-L86-	50	14	
	100/230	undercut	-L87-	50	14	
	230	undercut	-L94-	50	10	
	100/230	undercut	-HP3221-	40	18	
	230	undercut	-HP3251-	40	16	
	230	undercut	-HG13-	40	14	
	230	undercut	-HG24-	50	14	
	100/230	undercut	-HG29-	50	14	
	100/230	undercut	-HK12-	40	20	
	100/230	undercut	-HG8989-	40	16	
Coffee Mill	100/230	undercut	-F21-	30	20	
	100/230	undercut	-F35-	30	7	
	230	undercut	-L26-	50	10	
	100/230	undercut	-L84-	50	10	
	100/230	undercut	-L87-	50	14	
	230	undercut	-HG13-	40	14	
Drill	230	undercut	-L26-	50	10 [^]	
with and without electronics	100/230	undercut	-L28-	50	16	
	48/72/230	undercut	-L41-	40	20	
	100/230	undercut	-L42-	40	16	
	230	undercut	-L48-	50	14	
	230	undercut	-L53-	50	10	
	48/72	undercut	-L71-	20	20	
	230	undercut	-L85-	50	12	

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				Allowed Peripheral Speed m/s	Max. Constant Current Density A/cm ²	
Drill	100/230	undercut	-L87-	50	14	
with and without electronics	230	undercut	-L89-	50	10	
	230	undercut	-L94-	50	10	
	230	undercut	-HP3251-	40	16	
	230	undercut	-HG13-	40	14	
	230	undercut	-HG24-	50	14	
	100/230	undercut	-HG29-	50	14	
Dry Vacuum Cleaner	24/36	undercut	-A20-		25	
Wet Vacuum Cleaner/ Bypass	24/36	undercut	-A24-		25	
	12	undercut	-A52-		25	
(normal to high speeds)	12	undercut	-F21-		20	
	230	undercut	-G11-	60	14	
	230	undercut	-G15-	60	14	
	230	undercut	-G40-	60	10	
	230	undercut	-L53-	50	10	
	230	undercut	-L83-	50	12	
	230	undercut	-L84-	50	10	
	230	undercut	-L94-	50	10	
	24/36	undercut	-HK11-	40	20	
	230	undercut	-HG22-	60	16	
	100/230	undercut	-HG23-	60	16	
	230	undercut	-HG24-	50	14	
	100/230	undercut	-HG25-	60	16	
	100/230	undercut	-HG26-	60	16	
	100/230	undercut	-HG27-	50	16	
	100/230	undercut	-HG28-	50	18	
	230	undercut	-HG29-	50	14	
	100/230	undercut	-HG30-	60	16	
Floor Polisher	100/230	undercut	-L28-	50	16	
	230	undercut	-L53-	50	10	
	48/72	undercut	-L71-	30	20	
	230	undercut	-L75-	50	10	
	230	undercut	-L84-	50	10	
	230	undercut	-L85-	50	12	
	100/230	undercut	-L87-	50	14	
	230	undercut	-L94-	50	10	
	230	undercut	-HP3356-	40	14	

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				Allowed Peripheral Speed m/s	Max. Constant Current Density A/cm ²	
Food Processor	100/230	undercut	-F21-	30	20	
with and without electronics	100/230	undercut	-F35-	30	7	
	230	undercut	-L26-	50	10	
	230	undercut	-L53-	50	10	
	230	undercut	-L75-	50	10	
	230	undercut	-L84-	50	10	
	230	undercut	-L85-	50	12	
	230	undercut	-L94-	50	10	
	230	undercut	-HG13-	40	14	
	100/230	undercut	-HG22-	60	16	
Grounding Brush and Contact Brush		undercut	-F25-			
Hair Dryer	100/230	flush	-H18-	30	12	
	100/230	undercut	-F21-	30	20	
	100/230	undercut	-F35-	30	7	
	230	undercut	-L26-	50	10	
	230	undercut	-L94-	50	10	
	≥ 6	undercut	-K17-		25	
	≥ 12	undercut	-A52-		25	
	230	undercut	-HG13-	40	14	
	230	undercut	-HG24-	50	14	
Hedge Trimmer	230	undercut	-L75-	50	10	
	230	undercut	-L87-	50	14	
	230	undercut	-L94-	50	10	
Micromotor	3 - 12	undercut	-A10-		25	
	3 - 12	undercut	-A41-		25	
	3 - 12	undercut	-A43-		25	
	3 - 12	undercut	-A44-		25	
	3 - 12	undercut	-A47-		25	
	3 - 12	undercut	-A52-		25	
	3 - 12	undercut	-A55-		25	
	12 - 42	undercut	-A43-		25	
	3 - 12	undercut	-K17-		25	

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				Allowed Peripheral Speed m/s	Max. Constant Current Density A/cm ²	
Mixer	48/100/230	undercut	-F17-	30	20	
with and without electronics	100/230	undercut	-F21-	30	20	
	100/230	undercut	-F35-	30	7	
	100/230	undercut	-F37-	30	7	
	230	undercut	-L26-	50	10	
	230	undercut	-L73-	50	14	
	230	undercut	-L75-	50	10	
	230	undercut	-L84-	50	10	
	230	undercut	-L85-	50	12	
	230	undercut	-L94-	50	10	
	230	undercut	-HG13-	40	14	
	100/230	undercut	-HG22-	60	16	
Percussion Drill	100/230	undercut	-L28-	50	16	
with and without electronics	100/230	undercut	-L42-	40	16	
	100/230	undercut	-L48-	50	14	
	230	undercut	-L53-	50	10	
	48/72	undercut	-L71-	30	20	
	230	undercut	-L74-	50	10	
	230	undercut	-L75-	50	10	
	100/230	undercut	-L82-	50	16	
	230	undercut	-L85-	50	12	
	230	undercut	-L89-	50	10	
	230	undercut	-L94-	50	10	
	230	undercut	-HG24-	50	14	
	230	undercut	-HG31-	40	14	
	100/230	undercut	-HG8989-	40	16	
Power Nozzle	100/230	undercut	-A44-	30	25	
for Vacuum Cleaner	100/230	undercut	-F21-	40	20	
	230	undercut	-L25-	50	10	
	230	undercut	-L26-	50	10	
	230	undercut	-L85-	50	10	
	230	undercut	-L94-	50	10	
	230	undercut	-HG24-	50	14	
Rotary	100/230	undercut	-L28-	50	16	
Hammer Drill	100/230	undercut	-L42-	40	16	
	230	undercut	-L48-	50	14	
	230	undercut	-L53-	50	10	
	100/230	undercut	-L55-	50	14	

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				Allowed Peripheral Speed m/s	Max. Constant Current Density A/cm ²	
Rotary	230	undercut	-L74-	50	10	
Hammer Drill	230	undercut	-L75-	50	10	
	100/230	undercut	-L82-	50	16	
	230	undercut	-L85-	50	12	
	100/230	undercut	-L87-	50	14	
	230	undercut	-L89-	50	10	
	230	undercut	-L94-	50	10	
	230	undercut	-HP3251-	40	16	
Sewing Machine	100/230	undercut	-F21-	30	20	
with and without electronics	100/230	undercut	-F34-	30	7	under certain conditions rivetable
	100/230	undercut	-F35-	30	7	
	230	undercut	-L25-	50	10	under certain conditions rivetable
	230	undercut	-L26-	50	10	
	100/230	undercut	-L87-	50	14	
Tachometer		undercut	-E43-			
Generator		undercut	-S13-			
Toy Motor	3 - 12	undercut	-A10-		25	
	≤ 12	undercut	-A52-		25	rivetable
	≤ 12	undercut	-K17-		25	
Tumble-drier		undercut	-F25-			
Universal Drive Motor	230	undercut	-L25-	50	10	
	230	undercut	-L26-	50	10	
	100/230	undercut	-L42-	50	16	
	230	undercut	-L53-	50	10	
	100/230	undercut	-L82-	50	16	
	230	undercut	-L85-	50	10	
	100/230	undercut	-HP3221-	40	18	
	230	undercut	-HG22-	60	16	
Universal Slicer	100/230	undercut	-F21-	30	20	
with and without electronics	230	undercut	-L26-	50	10	
	230	undercut	-L73-	50	14	
	230	undercut	-L75-	50	10	
	230	undercut	-L94-	50	10	

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				Allowed Peripheral Speed m/s	Max. Constant Current Density A/cm ²	
Ventilator	≥ 12	undercut	-E43-		20	
	≤ 12	undercut	-F21-		20	
	≤ 12	undercut	-A44-		25	
	≤ 12	undercut	-A47-		25	
Wasching	25 - 230	undercut	-L41-	40	20	We recommend
Machine Motor AC	230	undercut	-L53-	50	10	carbon brushes in
with and without	100/230	undercut	-L82-	50	16	sandwich design
electronic	230	undercut	-L93-	50	12	(marked "M" following
	230	undercut	-L94-	50	10	the grade indica-
	230	undercut	-L95	50	10	tion) for electroni-
	100/230	undercut	-L97-	50	14	cally controlled
	230	undercut	-L98-	50	10	AC + DC-motors.
Wasching	230	undercut	-L24-	50	14	
Machine Motor DC	230	undercut	-L29-	50	12	
	100/120	undercut	-L82-	50	16	
	230	undercut	-L94-	50	10	

We generally recommend by the application of grades L-, H- and sometimes F-series af further impregnation on the carbon brushes. Our symbols F7 and F10, F12, F13, F20, F25 and F101 have proven excellent results with impregnation, whereby F7, F10, F12, F13, F20, F25, F101 and F131 has been preferred for the application on hand-operated power tools.

It is also possible to impregnate with our symbol ZP8.

The indicated maximum peripheral speeds are standard figures and are exclusively valid for impregnated grades.

Additional impregnations are possible.

All specifications above are typical average values and are based upon measurements with new carbon brushes and ideal conditions.

The figures are standard values without liability.

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