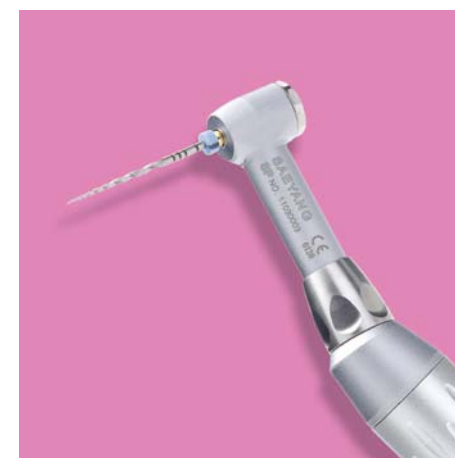
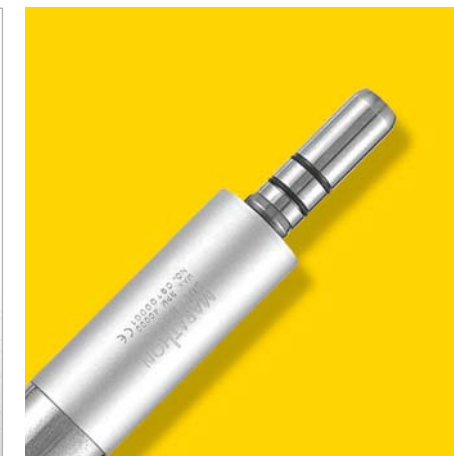
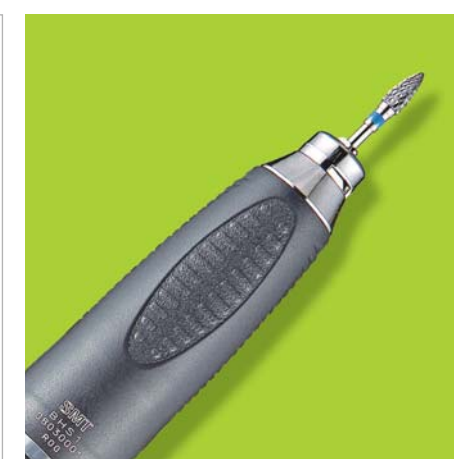


"Let's  
MARATHON"

www.saeyang.com



”  
The Best  
Creation of  
Micromotor



2011 Ver. II

## SAEYANG MICROTECH CO., LTD.

### HEAD OFFICE & FACTORY

100-39, Galsan-dong, Dalseo-gu, Daegu, 704-900 KOREA  
Tel. +82-53-582-9000~2 Fax. +82-53-581-9003 E-mail: marathon@saeyang.com

### SEOUL OFFICE

403, 4<sup>th</sup> FLOOR, CHONGAM B/D, Bongrae-dong, Jung-gu, SEOUL 100-161 KOREA  
Tel. +82-2-775-9023~5 Fax. +82-2-775-9026 E-mail: marathon@saeyang.com

20110906

SAEYANG MICROTECH

## “The Best Creation of Micromotor”

### I N D E X



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### Creative Innovation

Over 35 year old experience has created a surgical creation. Extremely quiet motor leads you to the highest satisfaction. Philosophy of master takes you to the future.

### Excellent Performance

World-wide best selling laboratory brushless micro motor engine & handpiece. You can feel the perfect performance more than your imagination.

### Outstanding Durability

Most popular laboratory brush micro motor engine & handpiece with incredible performance.

“Keep your **SMile** bright**T**”



**SAEYANG** creates the state-of-the-art technologies, providing you with Innovation, Excellence and Trust.

**SAEYANG** creates outstanding performances in the field of a micro motor handpiece for dental and laboratory technologies.

**SAEYANG** creates the innovative future more than your imagination and keeps going forward with the philosophy of master through the ceaseless R&D.

**SAEYANG** guarantees its products with Confidence and Philosophy created through the history of 35 years old.

# Endo *a* class

Excellence in Performance  
Sophisticated Endodontic Micromotor Handpiece  
Extremely Quiet Innovation

Endo a Class, a cordless endodontic handpiece, can drive from 120 to 2,000 rpm with its torque of 3.0 Ncm (16:1).  
Endo a Class also has the perfect safety function of Auto Stop Reverse that is absolutely essential for patients while their endodontic treatments.



# Experience Unbelievable Performance



We absolutely believe that the perfect safety for patients is the priority than anything else. When a limit value of a present torque gets exceeded, the handpiece stops immediately and runs automatically in reverse direction.



Input	Number of Program Memory	Battery Type	Max. Torque	Charge / Continuous use	Speed range	Dimensions (Handpiece) with Angle	Dimensions (Charging Station/Unit)	Weight (Handpiece) with Angle	Weight (Charging Station/Unit)
AC 100V ~ 240V 50/60Hz	4 EA	1.2V/1000mAh (2PCS)	3.0Ncm (with ratio 16:1)	90min / 90min	120~2000rpm (4:1, 10:1, 16:1, 20:1)	27(W) 29(D) 195(H)	98(W) 115(D) 60(H)	138g	171g



# Endo *e* class

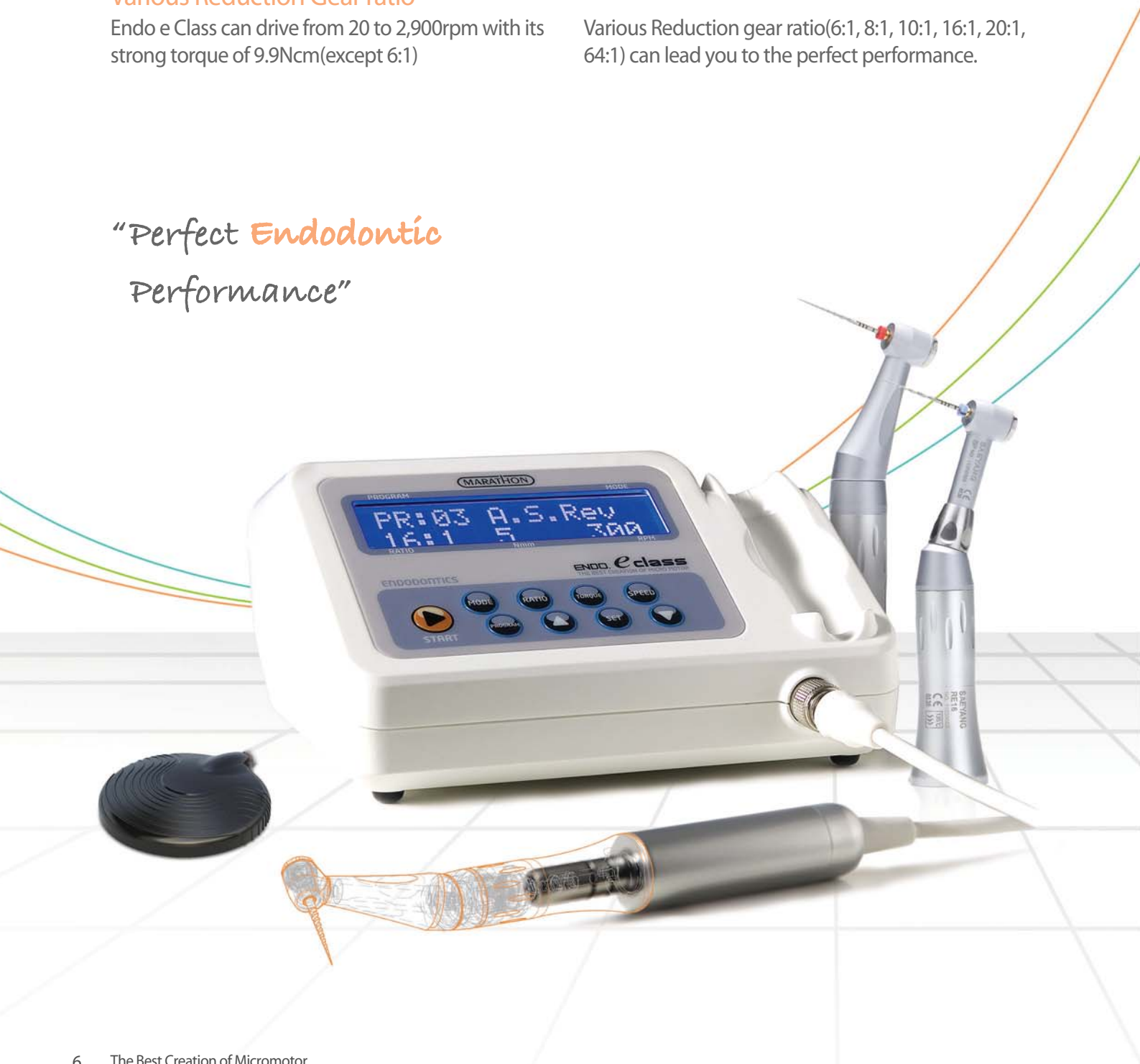
Innovation More Than Your Imagination  
Quiet and Comfortable Performance  
Accurate and Stable Performance

### Various Reduction Gear ratio

Endo e Class can drive from 20 to 2,900rpm with its strong torque of 9.9Ncm(except 6:1)

Various Reduction gear ratio(6:1, 8:1, 10:1, 16:1, 20:1, 64:1) can lead you to the perfect performance.

“Perfect *Endodontic* Performance”



## Accurate and Stable Endodontic Performance



SDE-EM24E for Endo e Class is the E-Type Motor that can be widely compatible with other contra angles.

### Safety functions

Endo e Class has the function of Auto Stop Reverse that is absolutely essential for patients to guarantee the safety while endodontic treatments.



Input	Number of Program Memory	Battery Type	Max. Torque	Charge / Continuous use	Speed range	Dimensions (Handpiece) with Angle	Dimensions (Charging Station/Unit)	Weight (Handpiece) with Angle	Weight (Charging Station/Unit)
AC 100 ~ 120V 50/60Hz AC 220 ~ 240V 50/60Hz	15EA	-	9.9Ncm (except 6:1)	-	20~2,900rpm (6:1, 8:1, 10:1, 16:1, 20:1, 64:1)	20(W) 168(L)	175(W) 125(D) 90(H)	125g	910g

# Contra Angles

“Reduction Gears”  
“Straight Nosecones & Contra Angles”  
“Air Motors”

## Contra Angles



Model	Ratio	Connector Diameter	File change	Type
SP-RE16	16:1	φ 19.6	Push Button	Angle type

Model	Ratio	Connector Diameter	File change	Type
SP-CE	1:1	φ 19.6	Button/Lever	Angle type

# Straight Nosecones & Air Motors

## Straight Nosecones



Model	SDE-ES04	SDE-ES6	SDE-AMI	SDE-AME
Ratio	4:1	1:1	-	-
Connector Diameter	φ 19.6		-	-
File change	Cam		-	-
Type	Straight type		Internal water spray	External water spray

## Air Motors





# Laboratory Brushless Micromotors

MARATHON



## >> BM50S1

It is the best brushless micromotor handpiece we can definitely recommend you. BM50S1 is the incredible flagship to reflect our outstanding high technologies in the field of a micromotor across the globe. BM50S1 is proud of its maximum 50,000 rpm with very strong torque. We guarantee the quality and you can feel the excellence in performance without doubt.

## << BM40S1

With the strongest torque, BM40S1 is absolutely proper for precise and detailed laboratory works that need strong power with its high maximum 40,000 rpm. We guarantee you're satisfied with both its very strong torque and its high rpm.



## >> BS50C

Lately developed through our sophisticated technologies, BS50C is highly recommended for female laboratory performers who want very high speed along with strong torque. This is proud of its maximum 50,000 rpm.

## << BS40E

It is proud of its 40,000 rpm that is the highest among E-Type motors. Especially, it is a brushless motor as an E-Type motor. In addition, its smallest size can be attractive and effective.



# Multi 600 Series

Easy Changeable to Knee Control or Desktop(2 Solutions) with One Unit

## Multi 600

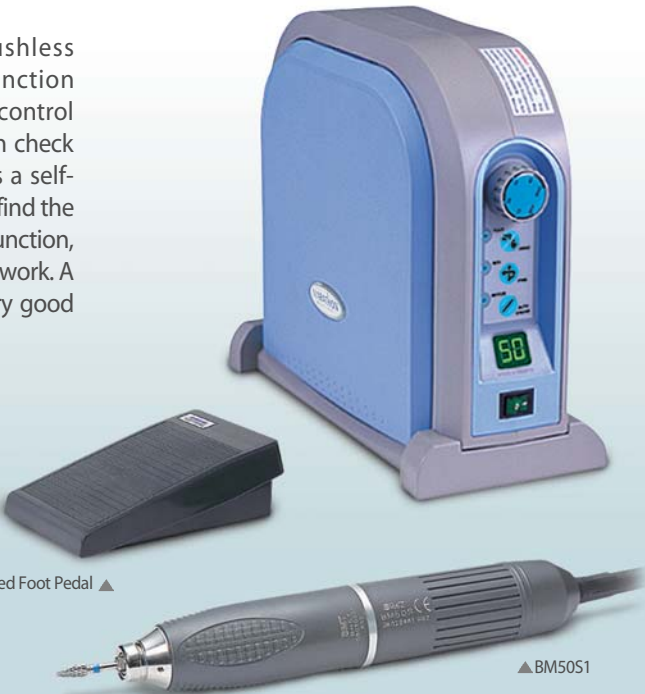
As one of representative laboratory brushless controllers, Multi 600 provides a multi-function performance both desk-top type and knee control type. As having a digital LCD, a performer can check the speed easily during the work. It also has a self-diagnosis function that enables a performer to find the problem very easily. Through its auto-cruise function, Multi 600 guarantees convenience and perfect work. A variable speed foot control pedal provides very good convenience while precise laboratory works.

- Speed Range: 1,000~50,000 rpm
- Torque: 7.8 Ncm
- Motor: BM50S1
- Variable foot speed control pedal: FS-60N



◀ Knee control style  
Mounting bracket for knee control

Variable Speed Foot Pedal ▲



▲ BM50S1



### Multi 600 Standard

- For Laboratory Brushless Micromotor
- Vertical Desktop Style
- Speed Range: 1,000~50,000 rpm
- Torque: 7.8 Ncm
- Motor: BM50S1



### Multi 600 Duo

- Dual Control System  
(Brushless and Brush Micromotor can be available)
- Desktop and Knee Type can be available
- Speed Range: 1,000~40,000 rpm
- Motor: BM40S1 (8.5 Ncm) / SH37LN (4.5 Ncm)

# Excel Series

Floor type Foot lever System

## Excel 800

As a specific brushless controller only for a floor type work attached with its foot lever system, Excel 800 provides performers with very convenience. Through its auto-cruise function, Excel 800 guarantees convenience and perfect work. Especially, Excel 800 doesn't have an over-heat problem even after a long hour performance through its effective ventilation design.

- Speed Range: 1,000~50,000 rpm
- Torque: 7.8 Ncm
- Motor: BM50S1



▲ BM50S1

Floor type Foot lever System ▶



### Excel 450

- Floor Type Foot Lever System
- For Laboratory Brush Micromotor
- Speed Range: 0~45,000 rpm



### SH37LN

- Laboratory Brush Micromotor
- Speed Range: 0~45,000 rpm
- Torque: 7.8 Ncm



# Handy 700 Series

Dual Control System both **Brushless** and **Brush Micromotor**

## Handy 700

As one of the best selling dual brushless and brush controllers, Handy 700 is proud of its excellent durability. It can be easily moved through its portable handle on the top of the product. With its ergonomic design, a performer can expect precise and convenient works. Error code can be displayed through its digital LCD.

- Speed Range: 1,000~**50,000** rpm
- Motor: BM50S1 (50,000 rpm / 7.8 Ncm) / BS50C (50,000 rpm / 4.5 Ncm) / SH37LN (45,000 rpm / 4.5 Ncm)
- Variable foot speed control pedal: FS-60N



## Handy 701

- For Laboratory Brushless Micromotor
- Speed Range: 1,000~**50,000** rpm
- Motor: BM50S1 (50,000 rpm / 7.8 Ncm) / BS50C (50,000 rpm / 4.0 Ncm) / BS40E (40,000 rpm / 2.0 Ncm)



## Handy 702

- Two different kinds of Brush Micromotor can be available at the same time
- Speed Range: 0~**45,000** rpm
- Motor: SH37L(M45) / SH40C (45,000 rpm / 4.5 Ncm)

# Eco Series

Economic & Simple

## Handy-Eco

Needless to say its very high power as a brushless controller, Handy-Eco is most proud of its space applications for both vertical and horizontal style. It has a round cradle for a motor handpiece with a digital LCD. You can easily move Handy-Eco to anywhere, providing its high quality as a brushless controller. And it can control the speed through a hand dial, targeting at a safety work.

- Speed Range: 1,000~**50,000** rpm
- Torque: 7.8 Ncm
- Motor: BM50S1
- Variable foot speed control pedal: FS-60N



## Eco 450

- For Laboratory Brush Micromotor
- Speed Range: 0~**45,000** rpm
- Variable foot speed control pedal: FS-60N



## SH37LN

- Laboratory Brush Micromotor
- Speed Range: 0~**45,000** rpm
- Torque: 4.5 Ncm



# Laboratory Brush Micromotors

MARATHON

## >> SH40C

As the most highclass level of Brush type micromotor, SH40C can lead you to the absolute stable performance with its strong torque & max 45,000rpm



## >> SH37LN

As the best representative brush micromotor handpiece, SH37LN is proud of its steady speed of 45,000 rpm and its powerful torque. You can feel the incredible durability.



## << SH37LN(280)

It is a brand-new handpiece for special works with its specific max 28,000rpm and its strong torque. It will satisfy special needs.



## >> H37L1

As the best representative brush micromotor handpiece, H37L1 is proud of its steady speed of 35,000 rpm and its powerful torque. You can feel the incredible durability.



## >> M33Es

It is the best representative E-type motor. As a basic E-type motor, all angles can be available even along with those of competitors. An excellent straight handpiece of ES6 can be well matched together, targeting at clinical, beauty and laboratory.



## >> H35SP1

With its functional stainless hand cap, H35SP1 provides an excellence in performance, especially for precise and detailed works. The slim head part enables performers to operate much more in detail.



# Marathon Series I

Dynamic Style For Multipurpose



- For Laboratory Brush Micromotor
- Speed Range: 0~**45,000** rpm
- Torque: 4.5 Ncm
- Automatic Safety Overload Protection System
- Dust-Proof Cover for Switch
- Variable Speed Foot Control Pedal: FS-60
- Motor: SH37LN



▲ Variable Speed Foot Pedal



◀ SH37LN





## Marathon-N2

- For Laboratory Brush Micromotor
- Speed Range: 0~**35,000** rpm
- Automatic Safety Overload Protection System
- Dust-Proof Cover for Switch
- Variable Speed Foot Control Pedal: FS-60



## SH37LN(280)

- Laboratory Brush Micromotor
- Speed Range: 0~**28,000** rpm
- Torque: 3.8 Ncm





- For Laboratory Brush Micromotor
- Speed Range: 0~**35,000** rpm
- Torque: 2.4 Ncm
- Embedded Handpiece Cradle and Bit Stand
- Forward & Reverse Switch / On & Off Foot Switch
- Motor: H37L1 / M33Es



◀ On / Off Foot Switch



▲ H37L1



▲ M33Es





## Marathon-3

- For Laboratory Brush Micromotor
- Speed Range: 0~**35,000** rpm
- Forward & Reverse Switch / On & Off Foot Switch



## H37LSP

- Laboratory Brush Micromotor
- Speed Range: 0~**35,000** rpm
- Torque: 3.2 Ncm



# Escort Series

Dynamic Style For Multipurpose

## Escort II Pro

- For Laboratory Brush Micromotor
- Speed Range: 0~**35,000** rpm
- Torque: 2.9 Ncm
- Embedded Handpiece Cradle and Bit Stand
- Automatic Safety Overload Protection System
- Variable Speed Foot Control: SFP73
- On/Off Foot Switch: SFP22
- Motor: H37L1



## Escort III

- For Laboratory Brush Micromotor
- Non-Stage speed dialing system
- Speed Range: 0~**35,000** rpm



## Marathon-4

- For Laboratory Brush Micromotor
- Speed Range: 0~**35,000** rpm
- Four Speed Control Knob

# Combi Series

Portable & Compact Size

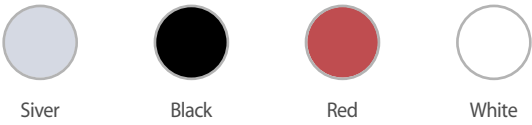
## Combi

- Easy Portable Type with a light weight (268g)
- Rechargeable Ni-Mh Battery Type (240 min. long operation possible)
- Four different colors available (Silver, Black, Red and Ivory)
- DC 12V
- Forward & Reverse Switch / Variable Speed Control Knob
- On/Off Foot Switch
- Motor: MH20 (20,000 rpm / 2.1 Ncm)  
MH20E (20,000 rpm / 2.1 Ncm)  
M25Es (25,000 rpm / 2.0 Ncm)



## Combi 24

- High Quality, Light weight and Compact size / Ergonomic design
- Four different colors available (Silver, Black, Red and Ivory)
- DC 24V
- Motor: MH24E (20,000 rpm / 3.1 Ncm)  
MH24 (20,000 rpm / 3.1 Ncm)





# Powerful Micromotors & Spindle

## SDE-SM110 (Hammer Handpiece) NEW

Brand-new powerful handpiece of SAEYANG MICROTECH, SM110 can lead you to the effective work environment with its reciprocating motion. It can strike 0~5,000 times per minute and be also operated by using both variable speed dial of controller and foot pedal. SM110 has a Control function of Impact Force, which can make your work more accurate-easier by adjusting the level of Impact Force through metal knurling ring on the handpiece.

- Hammer Handpiece
- Control function of Impact Force
- 5,000 Strokes/min.
- Controller : ECO450



### SDE-H300

- Multi Purpose for industry, grinding mould, casting & finishing surface
- High Torque: 5.3Ncm
- Speed Range: 8,000~35,000 rpm
- Controller: H300



### SDM-LS200 Laboratory Lathe Spindle

- Compatible Automatic Spindle with laboratory alloy grinders
- Positive high speed grinding possible
- Speed Range: 0~28,000 rpm

# Marathon Series II



## Marathon-20 Center Grinder

- Grinding Plaster Model
- Max Speed: 3,200 rpm
- Grinding Edge part of plaster model with an upper acetal plate
- Human-Friendly Dust Collecting System
- Tools can easily change
- Good & Effective design

## Marathon-103 Milling Machine

- Precise instrument with exact movement
- Easy exchangeable system (Spindle, model table, cone former and plaster)
- Excellent finished surface
- Variable Application possible
- Surveyor tools available

## Marathon-37 Cartridge Warmer

- Maintains painless temperature with 37°C (98.6 °F)
- Helps patients feel very comfortable
- Effective for painless injection



# Brushless

## Micromotor Handpieces

### #6102

SDE-BM50S1(Standard)

NON LOAD R.P.M	DIMENSION(mm)		WEIGHT(g)
	L	D	
1,000~50,000	159.8	26.2	238



### #6212

SDE-BM40S1(Power Torque)

NON LOAD R.P.M	DIMENSION(mm)		WEIGHT(g)
	L	D	
1,000~40,000	159.8	26.2	238



### #6103

SDE-BS50C(Slim)

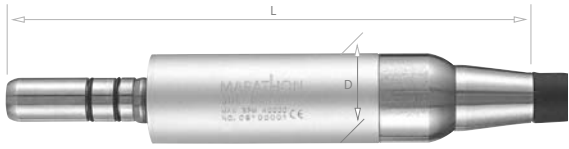
NON LOAD R.P.M	DIMENSION(mm)		WEIGHT(g)
	L	D	
1,000~50,000	147	24	210



### #6311

SDE-BS40E  
Brushless E-Type Motor /  
Autoclavable

NON LOAD R.P.M	DIMENSION(mm)		WEIGHT(g)
	L	D	
1,000~40,000	97.7	20	110



# Brush

## Micromotor Handpieces

### #9050

SDE-SH40C

NON LOAD R.P.M	DIMENSION(mm)		WEIGHT(g)
	L	D	
0~45,000	156.3	29.5	297



### #9014

SDE-SH37LN

NON LOAD R.P.M	DIMENSION(mm)		WEIGHT(g)
	L	D	
0~45,000	149.3	27.8	200



### #9045

SDE-H37L1

NON LOAD R.P.M	DIMENSION(mm)		WEIGHT(g)
	L	D	
0~35,000	152	28.9	268



### #9012

SDE-SH37L(M45)

NON LOAD R.P.M	DIMENSION(mm)		WEIGHT(g)
	L	D	
0~40,000	153.5	29.5	208



### #9043

SDE-H37LSP

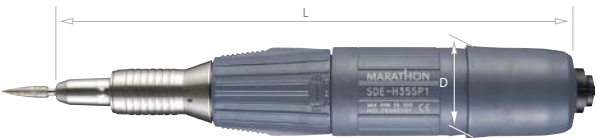
NON LOAD R.P.M	DIMENSION(mm)		WEIGHT(g)
	L	D	
0~35,000	154.6	27.5	218



### #9082

SDE-H35SP1

NON LOAD R.P.M	DIMENSION(mm)		WEIGHT(g)
	L	D	
0~35,000	160.6	28.9	266



### #9046

SDE-SH37LN(280)



NON LOAD R.P.M	DIMENSION(mm)		WEIGHT(g)
	L	D	
0~28,000	146.3	28.3	199.5



### #9044

SDE-H37SP  
For Milling Machine

NON LOAD R.P.M	DIMENSION(mm)		WEIGHT(g)
	L	D	
0~35,000	154.6	27.5	218



### #3010

SDE-H300

NON LOAD R.P.M	DIMENSION(mm)		WEIGHT(g)
	L	D	
8,000~35,000	195.5	36	486



### #3020

SDE-SM110  
Hammer Handpiece



Strokes/ 1min.	DIMENSION(mm)		WEIGHT(g)
	L	D	
5,000	158	29	280



# E-Type Motors & Handpieces

## #9093

SDE-M33Es E-Type Motor (0~35,000rpm)

## #9094

SDE-M25Es E-Type Motor (0~25,000rpm)

## #9095

SDE-M40Es E-Type Motor (0~40,000rpm)

DIMENSION(mm)		WEIGHT(g)
L	D	
98.4	25.4	160



## #9092

SDE-M33Es-B E-Type Motor / Autoclavable

NON LOAD R.P.M	DIMENSION(mm)		WEIGHT(g)
	L	D	
0~35,000	104	25.7	142



## #9096

SDE-MH20E E-Type Motor (12V)

## #9097

SDE-MH24E E-Type Motor (24V)

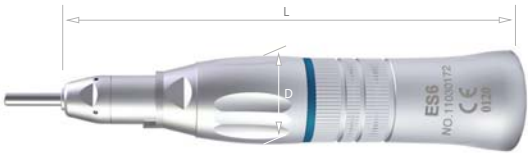
NON LOAD R.P.M	DIMENSION(mm)		WEIGHT(g)
	L	D	
0~20,000	96	20	70



## #7010

SDE-ES6  
Straight Handpiece(1:1) / Autoclavable

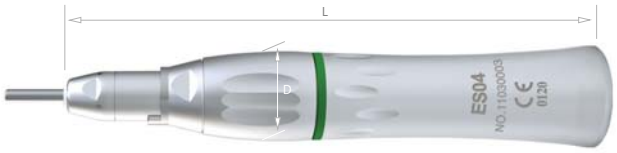
DIMENSION(mm)		WEIGHT(g)
L	D	
92.95	19.6	52.5



## #7020

SDE-ES04  
Straight Handpiece  
4:1 Reduction  
Autoclavable

DIMENSION(mm)		WEIGHT(g)
L	D	
99.8	19.6	71.5



## #7030

SP-CE Contra Angle(1:1)  
Autoclavable

DIMENSION(mm)		WEIGHT(g)
L	D	
84.8	19.6	43.5



## #E102

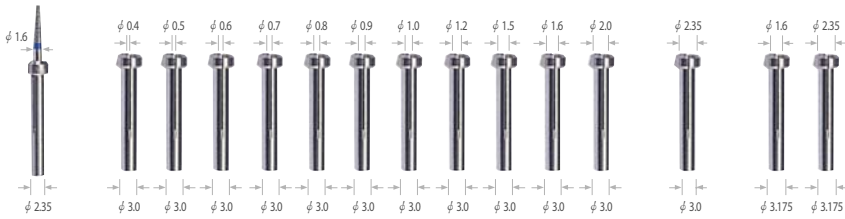
SP-RE16 Contra Angle  
16:1 Reduction  
Autoclavable

DIMENSION(mm)		WEIGHT(g)
L	D	
168	20	125



# Spare parts & Components

## Spare parts



Collet Sleeve  
Chuck Adapter

Collet Chuck  
φ 1.6 / φ 2.35 φ 3.0 / φ 3.175

Spindle Chuck  
φ 2.35 For SDM-LS200



Spindle Assembly  
For Brushless motor Handpiece SDE-BM50S1, BM40S1



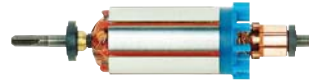
Spindle Assembly  
For Brush motor Handpiece SDE-H37L1, SH37L



Spindle Assembly  
For Brush motor Handpiece SDE-H35SP1



Armature  
SDE-SH37LN



Armature  
SDE-H37L1 / H35SP1



Armature  
SDE-M33Es



Micro Ball Bearing  
For Brushless Micro motor



Micro Ball Bearing  
For Brush Micro motor

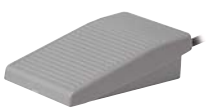


Carbon Brushes

## Components



Variable Speed Foot Pedal  
For FS-60N(Multi600 Series, HANDY Series, Eco Series) / FS-60(M-N7, M-N2, New N7, New N2) / SFP-72(M-N1) / SFP-70(M-7) / SFP-73(E-II Pro)



On / Off Foot Switch  
For SFP-27(M-N7, M-N2, Combi, Combi24, M3 Champ) / SFP-22(E-II Pro) / SFP-20N(M3, M4, E-III)



On / Off Foot Switch (Clinical)  
For SFP-10(ENDO e class)



Cord(Straight)  
For Brush Micromotor



Cord(Curling)  
For Brush Micromotor



Cord(Brushless)  
For Brushless Micromotor



Handpiece Cradle  
For Handy Series, ECO Series, E-II Pro, M-3 Champion



Handpiece Stand  
Grey, Black, White



Chuck Joint Wrench



Chuck Wrench



Spanner



# Specifications

Model	Multi 600	Multi 600 Standard	Multi Duo
Recommended Motor Handpiece	BM50S1	BM40S1	SH37L(M45)
Motor Speed Range (RPM)	1,000~50,000	1,000~40,000	0~45,000
Motor Torque (Ncm)	7.8Ncm	8.5Ncm	4.5Ncm
Input Voltage (AC) / Cycle (Hz)	100~120V / 220~240V (50/60Hz)		
Output Power (VA)	230W		100W
Foot Pedal (ON/OFF Switch & Variable Switch)	FS-60N(Variable)		
Total Weight (controller)	3.1Kg		2.9Kg
Height * Width * Depth	122(W) * 268(D) * 237(H)		
Length of Motor Cable	1.8m / 2m		2m(curling)

Model	Handy 700		Handy 701			Handy 702	
Recommended Motor Handpiece	BM50S1	SH37LN	BS40E	BS50C	BM40S1	SH37L(M45)	SH40C
Motor Speed Range (RPM)	1,000~50,000	0~45,000	1,000~40,000	1,000~50,000	1,000~40,000	0~45,000	0~45,000
Motor Torque (Ncm)	7.8Ncm	4.5Ncm	2.0Ncm	4.0Ncm	8.5Ncm	4.5Ncm	4.5Ncm
Input Voltage (AC) / Cycle (Hz)	100~120V / 220~240V (50/60Hz)						
Output Power (VA)	230W					100W	
Foot Pedal (ON/OFF Switch & Variable Switch)	FS-60N(Variable)						
Total Weight (controller)	2.7Kg					1.9Kg	
Height * Width * Depth	137(W)*232(D)*180(H)						
Length of Motor Cable	1.8m / 2m	2m(curling)	1.8m / 2m			1.8m(curling/straight)	

Model	Excel 800	Excel 450	Handy Eco	Eco 450
Recommended Motor Handpiece	BM50S1	SH37LN	BM50S1	SH37LN
Motor Speed Range (RPM)	1,000~50,000	0~45,000	1,000~50,000	0~45,000
Motor Torque (Ncm)	7.8Ncm	4.5Ncm	7.8Ncm	4.5Ncm
Input Voltage (AC) / Cycle (Hz)	100~120V / 220~240V (50/60Hz)		100~120V / 220~240V (50/60Hz)	
Output Power (VA)	230W	100W	150W	100W
Foot Pedal (ON/OFF Switch & Variable Switch)	-	-	FS-60N(Variable)	
Total Weight (controller)	2.9Kg	2.8Kg	1.6Kg	
Height * Width * Depth	245(W)*260(D)*105(H)		141(W)*186(D)*97(H)	
Length of Motor Cable	1.8m / 2m	2m(curling)	1.8m / 2m	2m(curling)

Model	Marathon-H300	New N7	New N2		M4
Recommended Motor Handpiece	H300	SH37LN	SH37LN(280)	H37L1	H37L1
Motor Speed Range (RPM)	8,000~35,000	0~45,000	0~28,000	0~35,000	
Motor Torque (Ncm)	5.3Ncm	4.5Ncm	3.8Ncm	2.9Ncm	
Input Voltage (AC) / Cycle (Hz)	110V,220V 50/60Hz				
Output Power (VA)	150W	100W	40W		
Foot Pedal (ON/OFF Switch & Variable Switch)	-	FS-60(Variable)			SFP-20N(On/Off)
Total Weight (controller)	130(W)*180(D)*85(H)	1.2Kg			1.3Kg
Height * Width * Depth	122(W) * 268(D) * 237(H)	115(W)*147(D)*68(H)			112(W)*147(D)*78(H)
Length of Motor Cable	-	1.8m(curling/straight)			

Model	Escort II PRO		Escort III		M-3 Champion		M3-Mighty	
Recommended Motor Handpiece	H37L1	H35SP1	H37L1	H35SP1	H37L1	M33Es	H37L1	H35SP1
Motor Speed Range (RPM)	0~35,000					0~35,000	0~35,000	
Motor Torque (Ncm)	2.9Ncm					2.4Ncm	2.9Ncm	
Input Voltage (AC) / Cycle (Hz)	110V,220V 50/60Hz							
Output Power (VA)	40W							
Foot Pedal (ON/OFF Switch & Variable Switch)	SFP-73 (Variable)		SFP-20N(On/Off)		SFP-27(On/Off)			
Total Weight (controller)	1.45Kg		1.25Kg		1.3Kg			
Height * Width * Depth	96(W)*125(D)*71(H)		112(W)*147(D)*78(H)		118(W)*156(D)*78(H)		143(W)*168(D)*85(H)	
Length of Motor Cable	1.8m(curling/straight)							

Model	Combi		Combi 24	
Recommended Motor Handpiece	MH20	MH20E	MH24	MH24E
Motor Speed Range (RPM)	0~20,000			
Motor Torque (Ncm)	2.1Ncm		3.1Ncm	
Input Voltage (AC) / Cycle (Hz)	INPUT AC 100V~240V (Adaptor)		110V,220V 50/60Hz	
Output Power (VA)	25W (Adaptor)		20W	
Foot Pedal (ON/OFF Switch & Variable Switch)	SFP-27(On/Off)			
Total Weight (controller)	268g		882g	
Height * Width * Depth	73(W)*170(D)*34(H)		117(W)*154(D)*72(H)	
Length of Motor Cable	1.5m(Straight)			
Battery Type	Battery Pack(Ni-Mh)		-	
Battery Voltage	12V(800mAh)		-	

Model	Catridge Warmer	Center Grinder	Milling Machine	SDE-LS200
RPM	-	3,200	-	-
Motor Torque (Ncm)	-	-	-	-
Input Voltage (AC) / Cycle (Hz)	110V,220V 50/60Hz		-	-
Weight	8.15Kg	7.2Kg	4.86Kg	-
Height * Width * Depth	92(W)*116(D)*132(H)	167(W)*213(D)*223(H)	175(W)*169(D)*257(H)	-

※ These specifications could be different depending on the combination of each controller & micromotor.

# Specifications

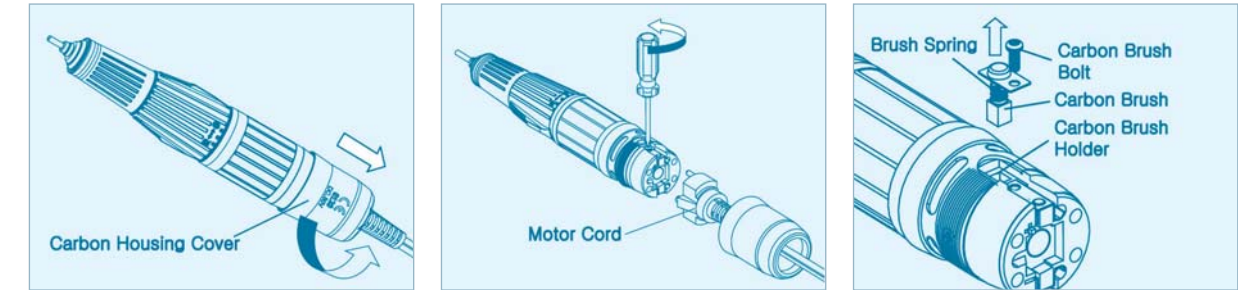
Model	endo a class	endo e class
Max. Torque	3.0Ncm(with ratio 16:1)	9.9Ncm(except 6:1)
Speed range	120~2000rpm(4:1, 10:1, 16:1, 20:1)	20~2,900rpm(6:1, 8:1, 10:1,16:1, 20:1, 64:1)
Program Memory	4 EA	15EA
Charge Min.	90min	-
Performance Min.	90min	-
Battery Type	1.2V/1000mAh(2PCS)	-
Input	AC 100V ~ 240V 50/60Hz	AC 100 ~ 120V 50/60Hz, AC 220 ~ 240V 50/60Hz
Dimension with Angle	27(W)*29(D)*195(H)	20(W)*168(L)
Weight with Angle	138g	125g

Model	SP-RA16	SP-RE16
Ratio	16:1	16:1
Connector Diameter	φ 17.7	φ 19.6
File change	Push Button	
Type	Angle type	

Model	SDE-ES04	SDE-ES6	SP-CE	SDE-AMI	SDE-AME
Ratio	4:1	1:1	1:1	-	
Connector Diameter	φ 19.6			-	
File change	Cam		Button / Lever	-	
Type	Straight type		Angle type	Internal water spray	External water spray

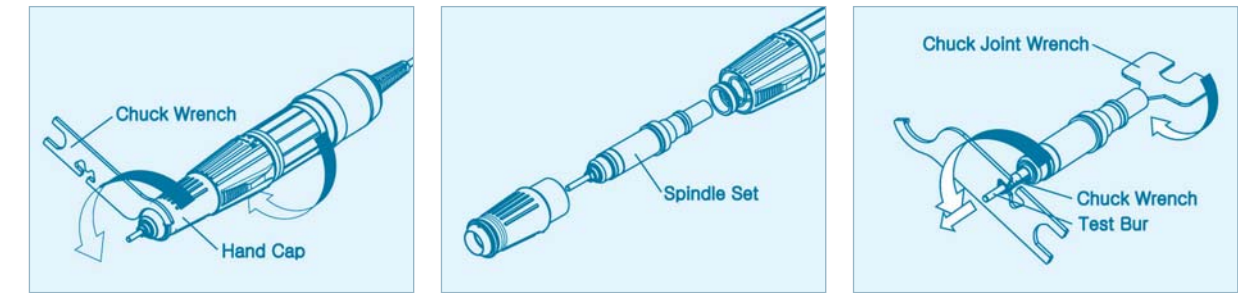
## \* Replacing Carbon Brushes

1. After turn off the power of the Control Unit, remove the Carbon Housing Cover and the Motor Cord from the rear of the Handpiece.
  2. Remove worn-out Carbon Brushes after taking off Carbon Brush Bolts using a screwdriver(+).
  3. Replace by new ones with observing the Brush Spring should get jammed in the Carbon Brush Holder.
  4. Assemble the Handpiece.
  5. After run the Handpiece under no load state about 20,000RPM for 30 minutes, then use.
- ※ Replacing cycle of Carbon Brushes being about one year, can be depending on working hours and loading conditions.



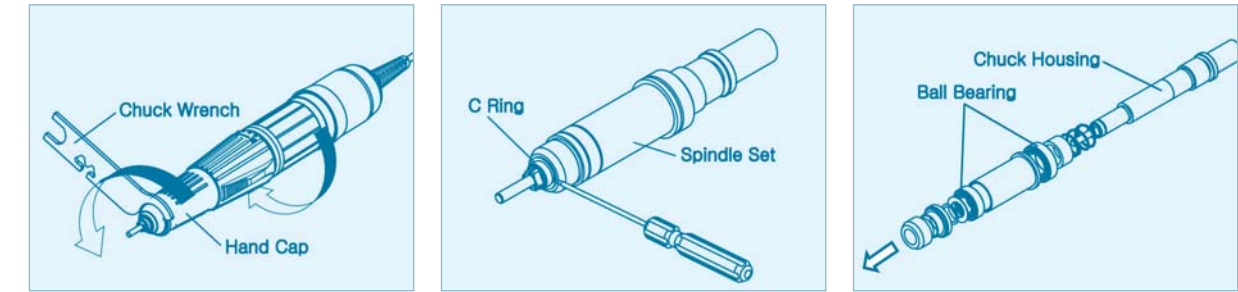
## \* Replacing the Collet Chuck

1. The Hand Cap and the Spindle Set are disjointed by continuously turning the Hand Cap countclockwise using the Chuck Wrench.
  2. The Collet Chuck is disjointed by continuously turning it countclockwise using tools.
  3. After replace by new Collet Chuck, assemble the Handpiece.
  4. After run the Handpiece under no load state and confirm something wrong nonexistence, then use.
- ※ Replacing cycle of the Collet Chuck being 2~3 years, can be depending on working hours and loading conditions.



## \* Replacing Ball Bearings

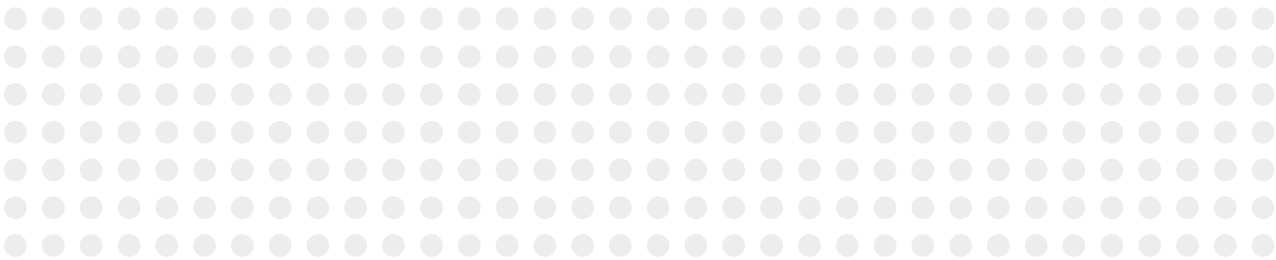
1. Disjoint the Hand Cap and the Spindle Set.
2. If remove the C Ring from the front of the Chuck Housing, Ball Bearings and other parts are disassembled.
3. After assemble other parts and replace with new Ball Bearings sequentially, install C Ring again.
4. Joint The Hand Cap and the Spindle Set.
5. After run the Handpiece under no load state and confirm something wrong nonexistence, then use.





# History

The History of 35 years-old creates the Excellence in Performance



MARATHON



Oct.	1976	Company Established
Dec.	1977	Registered manufacturing of medical equipment.
Sep.	1987	Registered trading business
Apr.	1989	Registered Korea medical equipment cooperative association
May	1991	Registered of designs for engine for dental laboratory
Apr.	1998	Certified ISO 9001 from TUV (Germany)
Feb.	1999	Certified CE Mark from TUV (Germany)
May	2000	Certified Venture enterprise for high technology
Nov.	2001	Awarded official Superior Exporting Firm
Nov.	2001	Awarded Leading Enterprise
Apr.	2002	Certified CE Mark of New item "Escort"
Jan.	2003	Registered manufacturing Brushless motor
Jun.	2003	Certified CE Mark of "Marathon Multi 600" Brushless motor
Jun.	2004	Established R&D center
Jul.	2004	Certified CE Mark of New item "Marathon N7 & N2"
Mar.	2005	Certified CE Mark of New item "Marathon HANDY 700 Series" Brush/Brushless motor
Dec.	2005	Awarded official best Exporting Firm
Apr.	2006	Moved into a new factory
Jul.	2006	Certified PSE from TUV
Oct.	2006	Opening Ceremony of a new factory as well as the 30th anniversary
Feb.	2008	Certified ISO 9001:2000 from SGS (U.K)
		Certified ISO 13485:2003 from SGS (U.K)
		Certified Directive 93/42/EEC from SGS (U.K)
Aug.	2010	Certified CE Mark of New item "Endo e class"
Mar.	2011	Development of Endo a class



## Introduction of SAEYANG MICROTECH

**SAEYANG MICROTECH Co.,** highly specializes in the research & development of micro motor handpiece with its state-of-art technologies that have been accumulated for over 35 years since its foundation in 1976. SMT has been consistently pursuing technological innovation and investing in the research

& development to create the masterpiece. Today, the outstanding products created by SMT are distributed through over 100 countries around the world and recognized as one of the best products. Sincerely, SMT promises to do the best in building the shining future with you together.



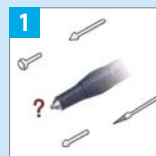
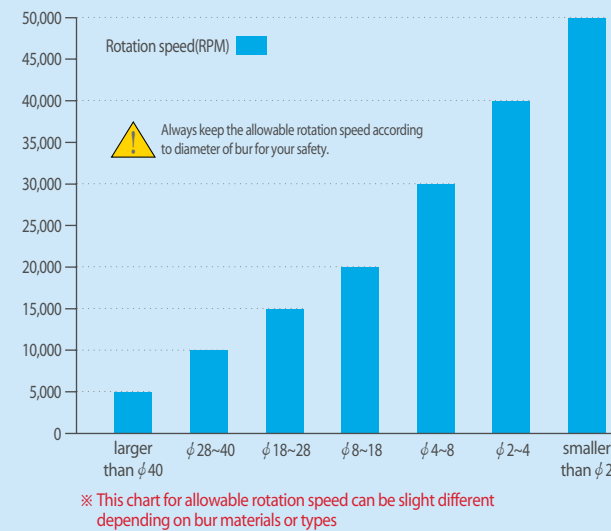
## Use of Marathon

## For safety and efficiency

### \* Precautions when using the micromotor

1. Wear safety goggles or a safety shield to protect your eyes of face when cutting or grinding works.
2. Never use bent, asymmetrical or damaged burs.  
Always use standard burs.
3. The sudden start is dangerous at high rotation speed.  
Accelerate slowly from low speed to desired speed.
4. Take every possible care not to drop the motor.  
(It may damage ball bearing or weaken durability of the motor)
5. Always keep the allowable rotation speed according to type of bur for your safety even though the motor is fully within the speed range max. 50,000rpm.  
(Please refer to below a chart for allowable rotation speed)
6. Never try to operate the chuck handle while the motor is in operation
7. Clean the motor after using.

**\* Allowable rotation speed**

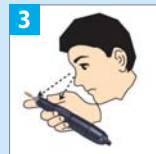


Select the of MARATHON product after examining the following conditions.

- Performance of the grinding tool
- Workpieces to be ground
- Grinding method



When taking your MARATHON from the box, never let it tumble out or fall down on the floor.  
Handle with special care any MARATHON product that is heavy or with sharp corners



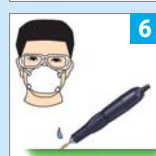
Inspect your MARATHON without fail before use, Before using your MARATHON, make sure, through visual inspection for safety, that your MARATHON has no, flaw, crack or faulty adhesion.



Secure proper mounting.  
When mounting your any kind of bur to your Handpiece, insert it properly to the final depth.  
Secure proper mounting of Bur with the correct amount of overhang



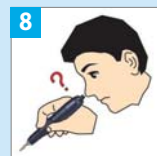
Use a suitable speed that has not exceed the maximum value.  
MARATHON Motor has a maximum speed. Exceeding the maximum speed may invite trouble including vibrations.



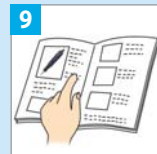
For securing safety in use: When using your MARATHON, wear goggles and a dust respirator without fail. When using a tool with a sharp edge, never touch it directly. If grinding a workpiece that is a hard material, flying chips may hurt you. When grinding a workpiece at high or superhigh speed, use coolant.



When taking your MARATHON from the box, never let it tumble out or fall down on the floor. Handle with special care any MARATHON product that is heavy or with sharp corners.



If any abnormal vibration begins during use, stop operating your tool and remove the cause.



For using any the of MARATHON, observe the operating instructions given in each manual.



Never use MARATHON for any purpose other than the original one, nor remodel it.



Store MARATHON in a dry place.  
Store your MARATHON in a place with the lowest possible humidity and moisture content and shielded from exposure to direct sunlight.  
Never miss daily inspection and maintenance.



Never leave your Motor Handpiece with the switch turned on, or an accident may occur if it is over-heated

## MEMO