

SANWA LAPTRON

Supersonic Lapping Machine
General Catalog

History and Innovation
Dramatically improved
technologies collected here

 SANWA SHOKO CO.,LTD.



LAPTRON ALLⅢ

LAPTRON ALLⅢR

LAPTRON 75R

LAPTRON μ
MYU

LAPTRON S

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LAPTRON ALL III

LAP-ALL3-CS

SANWA

Supersonic Lapping Machine

Challenging the ideal supersonic lapping machine
“Long-term Continuous Operation”
 and a **“Wider Power Zone.”**



Long-term continuous operation without interruption.

The newly developed transducer and the control circuit where heat generation is suppressed to the limit enabled stable lapping work without interruption triggered by the safety device even after many hours of use.

It ensured for large-size molds and micro-lapping.

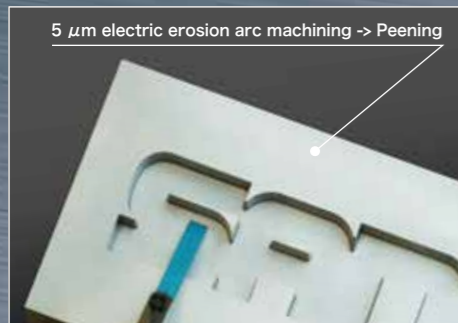
the high power of 50 μm maximum down to the extremely fine vibrations of 1 μm minimum are achieved. The wider power zone enabled wide-range lapping of large molds and precision lapping of micro-machined molds.

It ensures that the user will hardly feel fatigue even after many hours of use.

The newly developed $\phi 25\text{ mm}$ small diameter hand tool features the use of aluminum with excellent heat dissipation characteristics and a rib design that works as heat dissipation fins and a finger grip.

Example of lapping process

[Mold] SANWA Logotype Mold [Steel Used] NAK80



[Coarse Lapping] Using ceramic grinding stone



[Finishing] Using wood tip and diamond paste



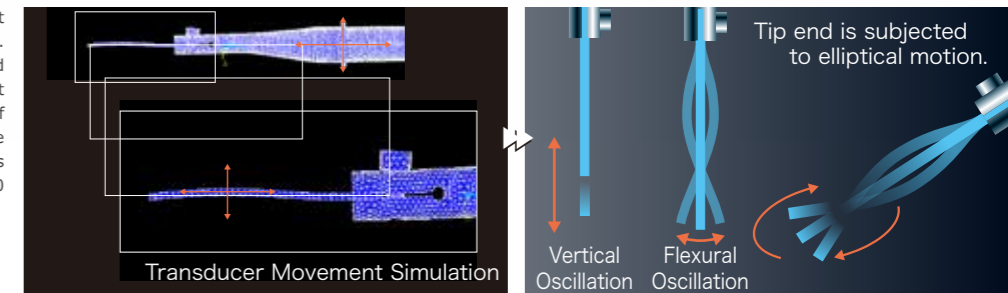
Aiming at the highest level, we rebuilt the supersonic lapping machine

The newly developed transducer and the control circuit where heat generation is suppressed to the limit enabled stable lapping work without interruption triggered by the safety device even after many hours of use. In addition, the newly developed $\phi 25\text{ mm}$ small diameter hand tool features the use of aluminum with excellent heat dissipation characteristics and a rib design that works as heat dissipation fins and a finger grip. The result is that the user hardly feels fatigue even after continued operation.

Furthermore, the high power of 50 μm maximum down to the extremely fine vibrations of 1 μm minimum are achieved. The wider power zone enabled wide-range lapping of large molds and precision lapping of micro-machined molds. Conventional lapping operations that were executed with two or more machines can now be handled with one Laptron machine. The through high-performance operation will achieve drastic improvement in the labor effectiveness.

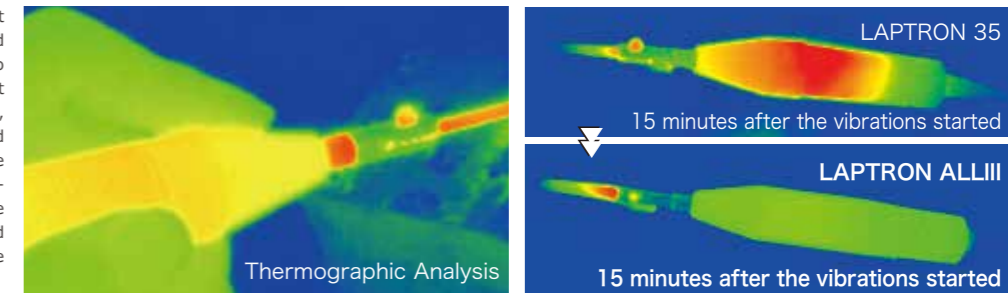
Research on Supersonic Polishing

The transducer is subject to flexural oscillations and it expands and contracts in the longitudinal direction. Execution of the transducer movement simulation and analysis of behaviors of the lapping tip end reveal that flexural oscillation overlaps the vibration amplitude of vertical oscillation, thereby causing the tip end to make an elliptical motion. Supersonic lapping becomes possible by performing such motions 18,000 to 26,000 times a second.



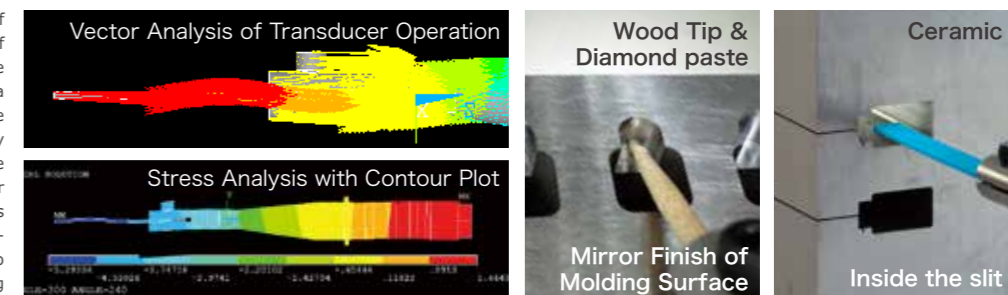
Analysis of Heat Generation Mechanism

Even when a product boasts high power, improvement in efficiency would not be achieved after repeated operational shutdowns caused by heat generation. To solve this problem, we pursued complete heat dissipation. Starting from optimization of the oscillator, we repeated trial and error over reexaminations and redevelopment of the control circuit, in addition to the selection and shape of materials for the chassis. Furthermore, thermographic analysis was applied to the prototype machines, and infinite processes of trial and error were repeated before we could conquer the problems without compromise.

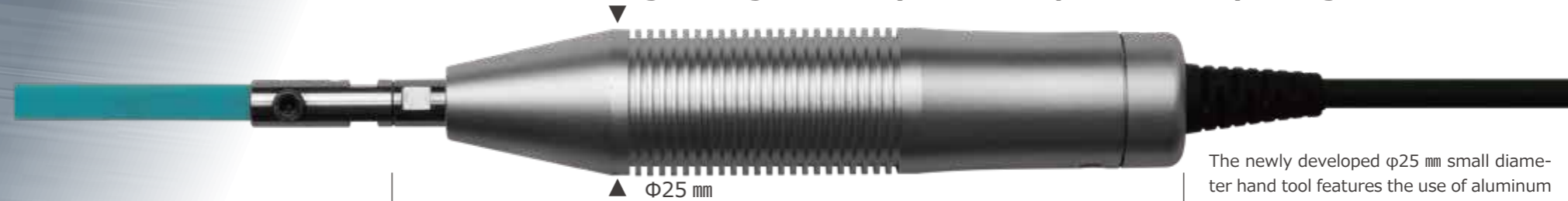


Simultaneous Achievement of Stable Micro-Vibration and High Output

To realize a lapping machine which is capable of performing a series of operations from handling of mirror finish that needs stable micro-vibration under the loaded condition, up to erasure of flaws by using a machine tool where the speed and the high output are demanded by only one machine. For such apparently contradictory needs, we succeeded in setting up the position, shape, and size of the transducer after repeating various analyses and simulations, as well as processes of trial and error. The result is the development of the ideal transducer that is persistent to micro-vibrations and is capable of seamlessly dealing with a wide range of outputs up to high output.



Lightweight & easy-to-hold $\phi 25\text{ mm}$ newly designed hand tool



Actual Size

○ Refer to the separate catalog of tip for further information on tips and chucks. ○ See pages 5 and 6 for the handle tools.

The newly developed $\phi 25\text{ mm}$ small diameter hand tool features the use of aluminum with excellent heat dissipation characteristics and a rib design that works as heat dissipation fins and a finger grip.

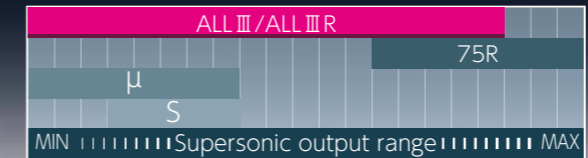
LAPTRON ALL III R

SANWA

Supersonic Lapping Machine

LAP-ALL3R-CS Rotary hand tool included
LAP-ALL3R-NRS Rotary hand tool not included

Rotary Function Equipped for Ultimacy



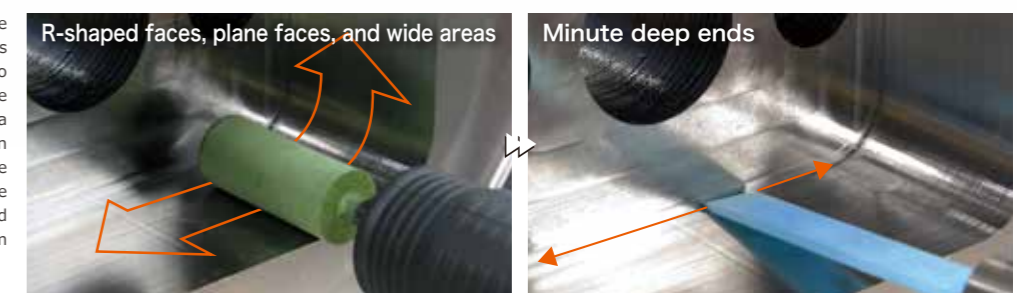
Two functions, supersonic and rotary, embedded in a single unit

Thanks to the newly developed oscillator and control circuit that suppress heat generation to the utmost, the ALL III that is not interrupted by the safety device even for long-term use and can perform stable lapping is equipped with the rotary function. Only one unit of this machine is necessary to handle many kinds of lapping operations, for example lapping round holes, R-shaped faces, U-shaped grooves, and mirror-like surfaces, which have required multiple machines thus far.

This machine can be used for all kinds of molds, including plastic molds, die cast molds, press molds, rubber molds, glass molds, and more. This machine allows users to perform lapping operations speedily. This machine is available for both nonferrous metals and super-hard metals. You do not have to be careful about the metal material to be lapped, and you can just lap it with a high degree of precision. You can really understand the performance especially in the lapping after electro-discharge machining.

Just One Single Machine Required for Complicated Shapes and Minute Points

R-shaped faces, plane faces, and wide areas can be lapped with the rotary function, and minute deep ends can be lapped with the supersonic function. There is no need to change lapping machines—a single this machine can lap both types. The rotary hand tool uses a high-torque and low-rotation motor. Use of it in combination with a rubber grindstone increases the efficiency and expands the life of the grindstone. The supersonic hand tool achieves both high output and minute treatment, and uses a newly designed aluminum hand tool that suppresses heat generation.



A wide variety of tips are available; for example, a ceramic stone, a metal bond-diamond tip, an electroplated diamond tip, softwood tip, and standard tips to support various types of lapping including from removal of unevenness generated at processing and hardened layer to finishing lapping of ebony and all kinds of metals, such as brass. In addition, a 120-degree chuck is also available to conveniently lap complicated portions. There are also many kinds of rubber grindstones waiting for you.

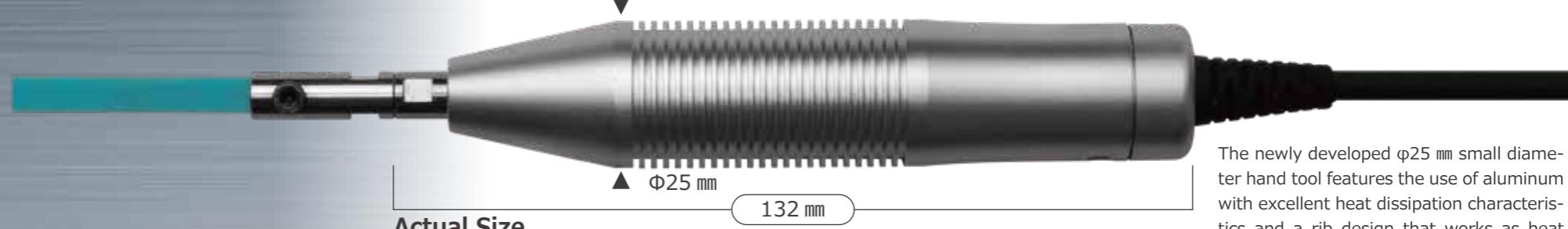


Rotary hand tool suitable for round faces and burr treatment



The maximum rotation is 15,000 rpm (at 30 V DC), and the product is equipped with a safety device to stop it automatically in the event of an overload.

Lightweight & easy-to-hold Φ25 mm newly designed hand tool



The newly developed Φ25 mm small diameter hand tool features the use of aluminum with excellent heat dissipation characteristics and a rib design that works as heat dissipation fins and a finger grip.

Significant improvement in efficiency of curved surface operation

The combination of supersonic technology and rotary function allows the lapping operation to be accelerated and simplified for plain faces, slits, round holes, R-shaped faces, U-shaped grooves, and more. A variety of tips are available, and those can be attached and detached with one-touch operation.

Introduction of high-torque and low-rotation motor

This product uses a load-resistant, high-torque, and low-rotation motor; therefore, the life of the grindstone is extended. The maximum rotation is 15,000 rpm (at 30 V DC), and the product is equipped with a safety device to stop it automatically in the event of an overload.

Supersonic + rotary = extensive applications

The rotary function and supersonic wide power zone allow this product to lap a wide area of a large-sized mold and to finely lap a minute mold.

※You can also select a model that does not come with a rotary hand tool.

○ Refer to the separate catalog of tip for further information on tips and chucks. ○ See pages 5 and 6 for the handle tools.

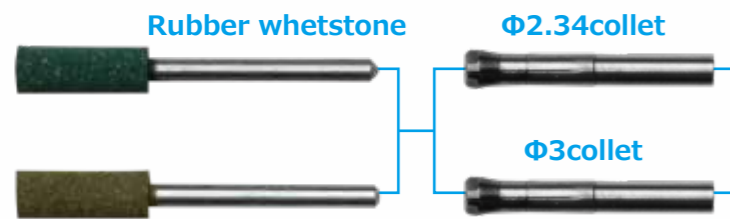
LAPTRON ALLIII R · ALLIII

SANWA

Supersonic Lapping Machine

■ Accessory chart

There are hand tools, heads, chucks, and grindstones available to support a wide range of business fields and applications. For chucks and grindstones, you can select those from the standard set, finishing set, and burr removal set, depending on your field and operation contents.

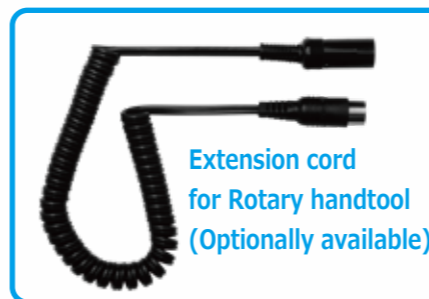


ALLIII R

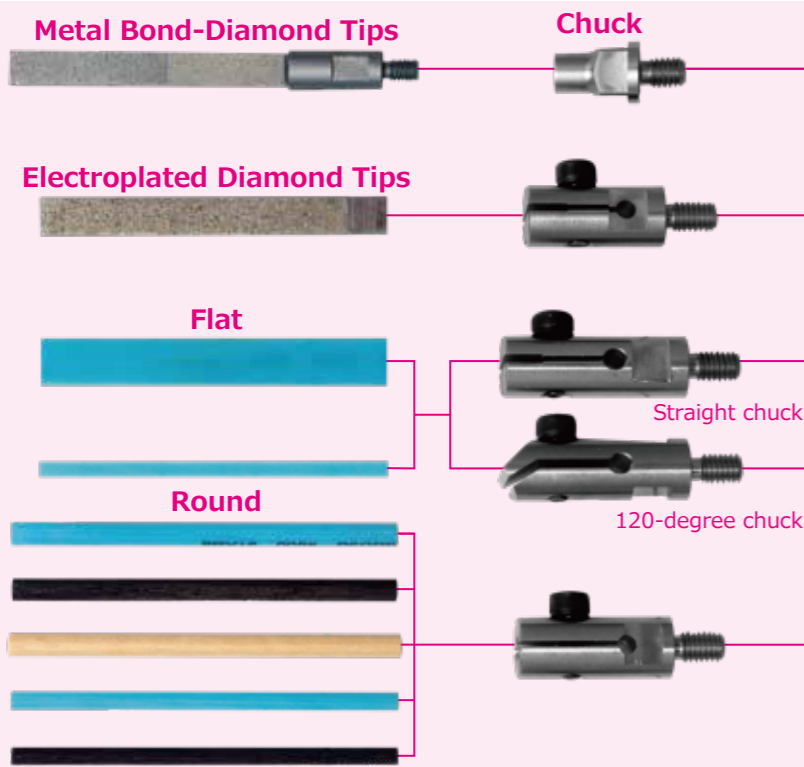
Rotary handtool

ALL IIR-dedicated

※You can also select a model that does not come with a rotary hand tool.

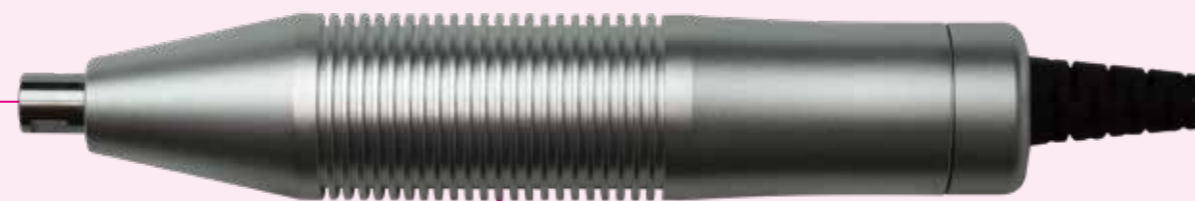


Foot switch
Common to ALLIII R / ALLIII



Supersonic handtool

Common to ALLIII R / ALLIII



ALLIII



○ Refer to the separate catalog of tip for further information on tips and chucks.

LAPTRON 75R

LAP-75R-100CS 100-120V
LAP-75R-200CS 200-240V

SANWA

Supersonic Lapping Machine

Series Highest Output Model Equipped with Rotary Function

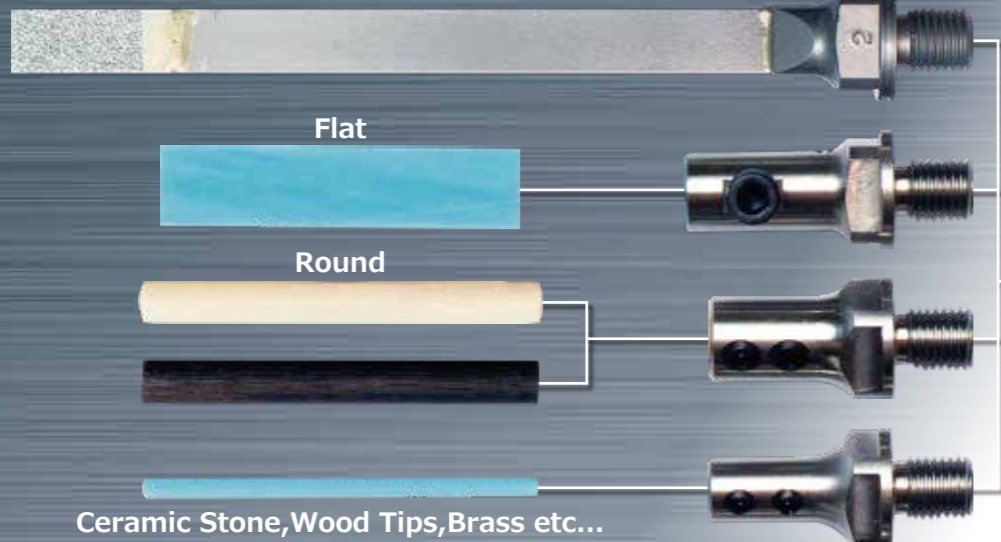


High-precision lapping
regardless of material

High power maximum output 55W

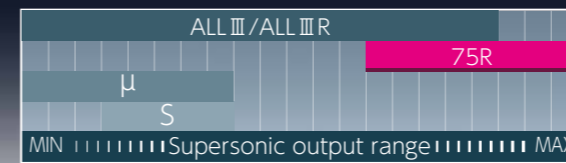


Metal Bond-Diamond Tips



Ceramic Stone, Wood Tips, Brass etc...

※Wood chips are sold only in Japan.



From precise mold to large-sized mold

Now you can lap even the parts with high precision that you have not been able to lap by hand so far, such as lapping ribs, slits, and variant holes, for flattening concavities, making precise angles at corners, and more. Even beginners can easily finish up to the mirror-like surfaces. This product features high output power of up to 55 W. The output can be

adjusted to four levels; accordingly, you can select the appropriate output power depending on the conditions of use. The frequency that changes according to the length and thickness of a tip is automatically followed. Then, feedback is promptly transmitted, vibration is controlled, and the optimal processing state is maintained.

Outstanding Operation Capability where All Kinds of Materials are Acceptable, and All Molds Supported

All kinds of molds, such as plastic molds, die cast molds, and press molds that are a matter of course, rubber molds, and even glass molds, can be speedily lapped. Speedy and high-precision lapping for materials from nonferrous metals to super-hard metals, whatever the material is, has been realized.



Mirror finish



Deep&narrow slits

Rotary lapping can be applied to R-shaped faces, plane faces, and wide areas, and supersonic lapping can be applied to minute deep ends. This one single unit is required to do both of them without using multiple lapping machines.



Wide lapping



R-shaped

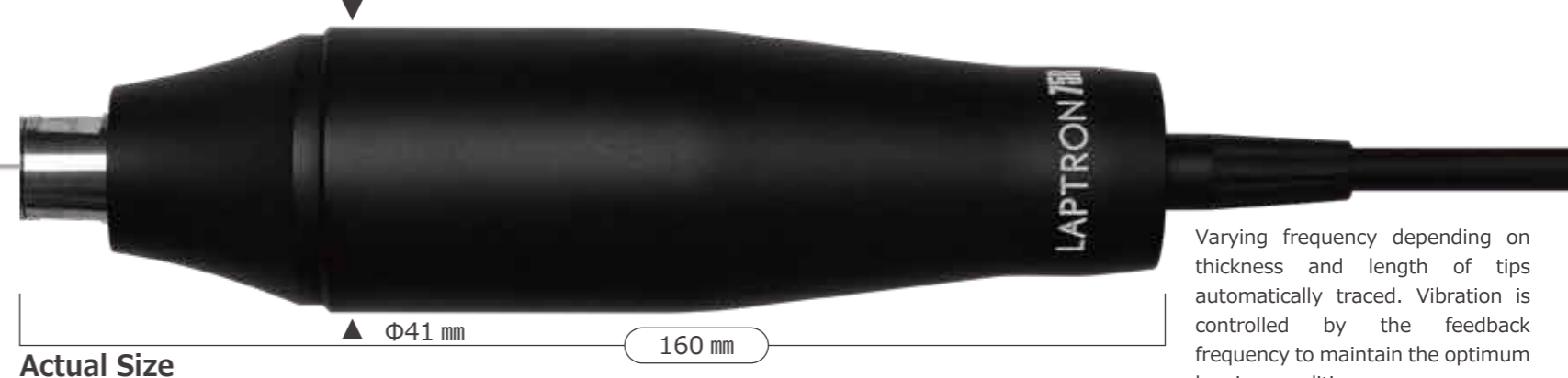
■ Rotary hand tool suitable for round faces and burr treatment



Actual Sizat

Maximum rotation is 30,000 rpm (at 30 V DC). This machine is equipped with a safety device to automatically stop this machine in the event of an overload.

■ High-performance supersonic hand tool to automatically control frequency



Actual Size

Varying frequency depending on thickness and length of tips automatically traced. Vibration is controlled by the feedback frequency to maintain the optimum lapping condition

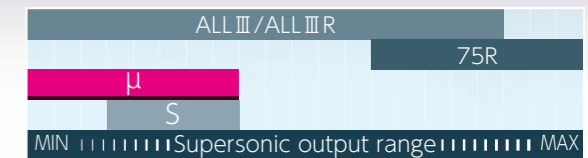
○ Refer to the separate catalog of tip for further information on tips and chucks.

LAPTRON μ

MYU

LAP-my-100CS 100-120V
LAP-my-200CS 200-240V

To go into the minutest details Micro Lapping Specialized Model



Supersonic hand tool, most compact in the series

A model applicable to minute portions, which can use a chuck with the minimum diameter in the series, has been added to the lineup. The diameter of the hand tool is as small as 20 mm, which has achieved flexibly adaptable operation. The dedicated chuck with an outer diameter of 5 mm is applicable to both flat and round types and is best suited for 1 to 2 mm tips.

This product has a small chuck diameter and is specialized for lapping in minute portions. Use of this product allows lapping deep corners with EDM texture where unevenness is likely to appear and lapping the portions of a product shape with 1 mm or less in length to be performed with ease. Not only ceramic tips but also metal bond tips with a small diameter and wood tips can be used.

Metal bond diamond tips usable

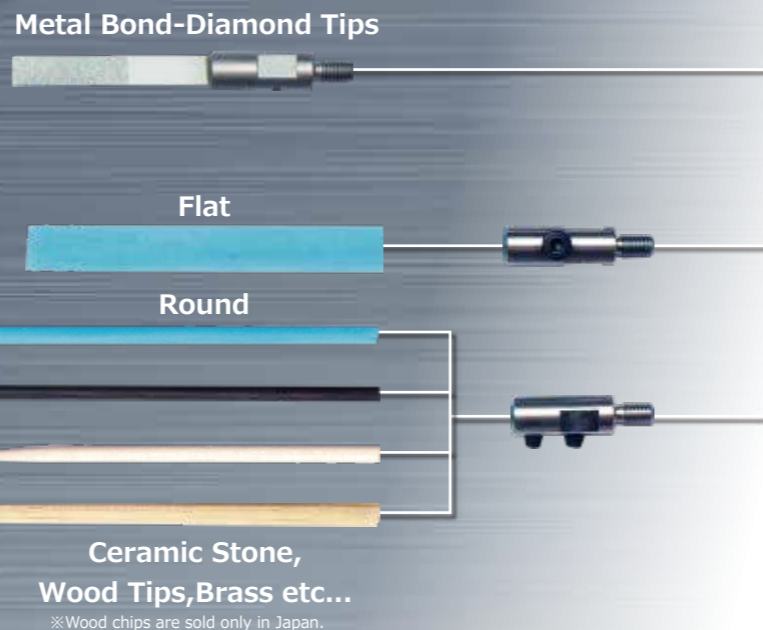
Not only ceramic and wood tips but also metal bond diamond tips can be used. Ceramic tips can be flexibly moved even after processing them into various shapes, and accordingly, the use of ceramic tips allows lapping according to finer product shapes to be achieved.



For processing deep corners with EDM texture where unevenness is likely to appear
Lapping even the portions of a product shape with 1 mm or less in length



Slide mold lapping
Material: STAVAX
Dimensions: 8 x 6 mm
Tip: Ceramic, 1 mm in width



※Wood chips are sold only in Japan.

■ Laptron μ-dedicated hand tool, succeeding to hand tools of the Laptron Pen

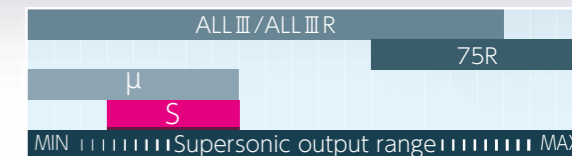


○ Refer to the separate catalog of tip for further information on tips and chucks.



LAP-S-100CS 100-120V

LAP-S-200CS 200-240V



Ceramic tip-dedicated entry model



Reasonable ceramic stone-dedicated type

This model is best suited for introducing supersonic waves to mold lapping. Ceramic stones with a wide variety of counts and sizes are available. This product can be used for complicated shapes, such as ribs, slits, strange-shaped holes, and corner making processes, because this model can be used after processing a ceramic point according to the desired shape.

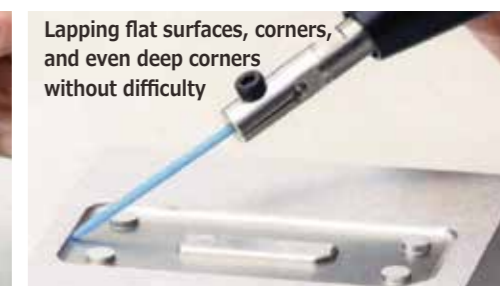
This product has a simple and efficient design. Although this product is reasonable, it can be used for lapping from micro portions to power-needed portions. With simple output adjustment and without heat generation, even a female operator can comfortably operate it.

Applicable to complicated shapes at will

The portions that could not be handled with conventional handwork, including lapping ribs, slits, and strange-shaped holes, flattening processing of a concave bottom and accurate corner making can be lapped with high precision.



Slim lightweight hand tool, handy even for female operators



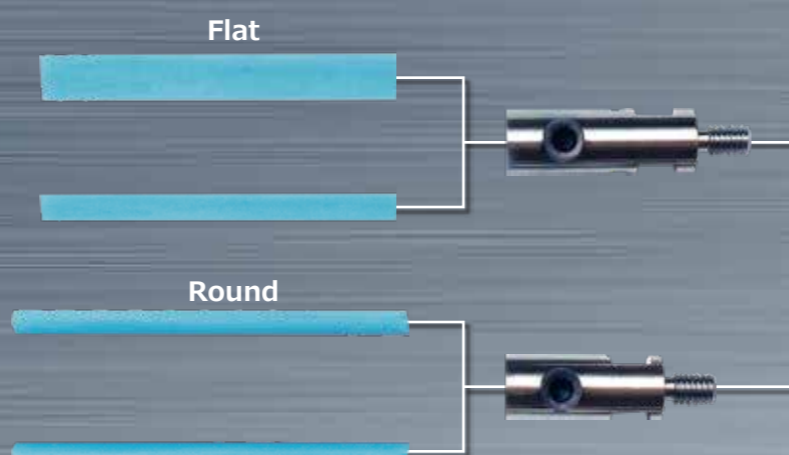
Lapping flat surfaces, corners, and even deep corners without difficulty

For both minute lapping and powerful operation

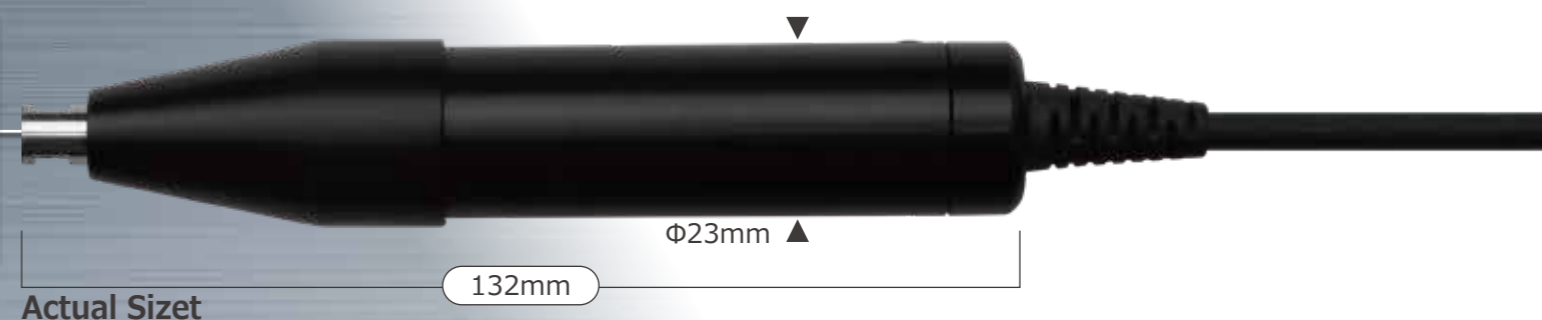
A simple, efficient design



Step-less output power adjustment



The slim, lightweight Laptron S-dedicated hand tool is 23 mm in diameter.



Refer to the separate catalog of tip for further information on tips and chucks.

■ Comparison table of supersonic hand tools

From large-sized molds to micro molds, you can select the best lapping machine according to your application.

LAPTRON **75R**

Supersonic MAX 55W

Diameter
41
mm

Weight
approx.356g

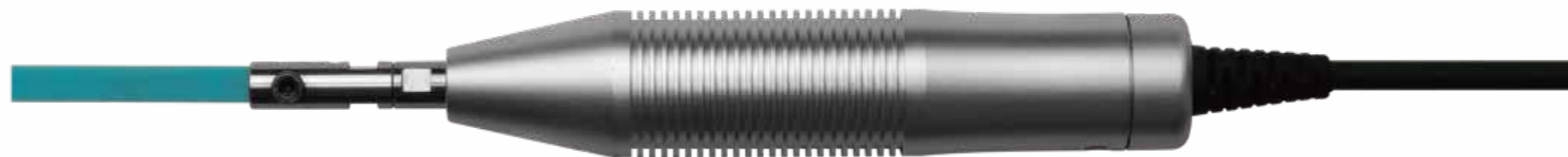


LAPTRON **ALL III** LAPTRON **ALL III R**

Supersonic MAX 48W

Diameter
25
mm

Weight
approx.205g



LAPTRON **S**

Supersonic MAX 13W

Diameter
23
mm

Weight
approx.110g



LAPTRON **μ** MYU

Supersonic MAX 13W

Diameter
20
mm

Weight
approx.57g



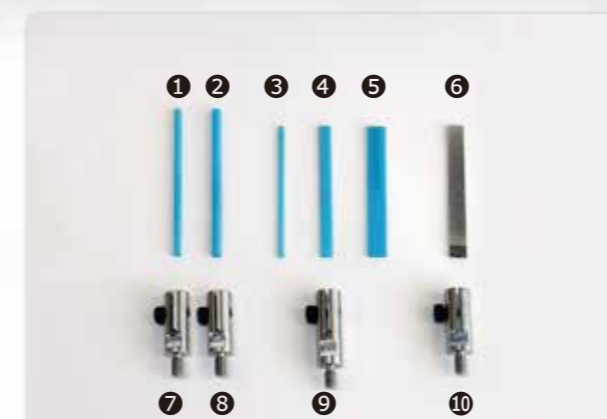
Configuration • Specifications

LAPTRON ALL III



| | |
|------------------------|--|
| Product number | LAP-ALL3-CS |
| Input | AC100V-240V 50/60Hz |
| Output | 48W max |
| Supersonic oscillation | 18-26 k Hz (With automatic frequency following function) |
| Amplitude Range | MAX 50µm – MIN 1µm |
| Dimensions | Power unit : W220mm×D217mm×H108mm Supersonic handtool : φ25mm |
| Weight | Power unit : approx.3.2kg Supersonic handtool : approx.205g |

Standard set



| | | | |
|-------|---|------------|------|
| Tip | ① Super Stone | NSBD2 L50 | #800 |
| | ② Super Stone | NSBD3 L50 | #800 |
| | ③ Super Stone | NSB102 L45 | #800 |
| | ④ Super Stone | NSB104 L45 | #800 |
| | ⑤ Super Stone | NSB106 L45 | #800 |
| | ⑥ Electroplated Diamond Tips | SD205-45 | |
| Chuck | ⑦ SNE24 | | |
| | ⑧ SNE31 | | |
| | ⑨ STA11L(L24mm /For Ceramic Tips) | | |
| | ⑩ STA11-18(L18mm /For Electroplated Diamond Tips) | | |

※Wood chips are sold only in Japan.

LAPTRON ALL III R



| | |
|------------------------|---|
| Product number | LAP-ALL3R-CS (Rotary hand tool included) LAP-ALL3R-NRS (Rotary hand tool not included) |
| Input | AC100V-240V 50/60Hz |
| Output | 48W max |
| Supersonic oscillation | 18-26 k Hz (With automatic frequency following function) |
| Amplitude Range | MAX 50µm – MIN 1µm |
| DC Motor | DC3~30V |
| No-load rotation speed | 1,500~15,000rpm |
| Maximum torque | 8.8N/cm |
| Dimensions | Power unit : W220mm×D217mm×H108mm Supersonic handtool : φ25mm Rotary handtool : φ31.6mm |
| Weight | Power unit : approx.3.2kg Supersonic handtool : approx.約205g Rotary handtool : 270g |

You can choose from 3 types of attached tips.

Standard set



| | | | |
|------------------|---|-----------|------|
| Tip | ① Super Stone | SBD2 L50 | #800 |
| | ② Super Stone | SBD3 L50 | #800 |
| | ③ Super Stone | SB106 L45 | #800 |
| | ④ Super Stone | SB102 L45 | #800 |
| | ⑤ Electroplated Diamond Tips | SD205-45 | |
| Chuck | ⑥ SNE24 | | |
| | ⑦ SNE31 | | |
| | ⑧ STA11L(L24mm /For Ceramic Tips) | | |
| | ⑨ STA11-18(L18mm /For Electroplated Diamond Tips) | | |
| Rubber whetstone | ⑩ RCM80-6 | #80 | |
| | ⑪ RCM120-6 | #120 | |
| Collet | ⑫ φ2.34 | | |
| | ⑬ φ3.0 (Installed to attached rotary hand tool) | | |

※Rubber whetstone/collet are included only with LAP-ALL3R-CS.
※Wood chips are sold only in Japan.

For finishing set



| | | | |
|------------------|---|-----------|-------|
| Tip | ① Super Stone | SWD2 L50 | #1000 |
| | ② Super Stone | SWD3 L50 | #1000 |
| | ③ Super Stone | SW106 L45 | #1000 |
| | ④ Super Stone | SW102 L45 | #1000 |
| | ⑤ Electroplated Diamond Tips | SD205-45 | |
| Chuck | ⑥ SNE24 | | |
| | ⑦ SNE31 | | |
| | ⑧ STA11L(L24mm /For Ceramic Tips) | | |
| | ⑨ STA11-18(L18mm /For Electroplated Diamond Tips) | | |
| Rubber whetstone | ⑩ RCM320-6 | #320 | |
| | ⑪ ROX600-6 | #600 | |
| | ⑫ φ2.34 | | |
| Collet | ⑬ φ3.0 (Installed to attached rotary hand tool) | | |

※Rubber whetstone/collet are included only with LAP-ALL3R-CS.
※Wood chips are sold only in Japan.

For burr removal set



| | | | |
|------------------|---|-----------|------|
| Tip | ① Super Stone | SBD3 L50 | #800 |
| | ② Super Stone | SB106 L45 | #800 |
| | ③ Electroplated Diamond Tips | SD205-4 | 2pcs |
| Chuck | ④ SNE24 | | |
| | ⑤ SNE31 | | |
| | ⑥ STA11L(L24mm /For Ceramic Tips) | | |
| | ⑦ STA11-18(L18mm /For Electroplated Diamond Tips) | | |
| Rubber whetstone | ⑧ RCM60-6 | #80 | |
| | ⑨ RCM120-6 | #120 | |
| | ⑩ φ2.34 | | |
| Collet | ⑪ φ3.0 (Installed to attached rotary hand tool) | | |

※Rubber whetstone/collet are included only with LAP-ALL3R-CS.
※Wood chips are sold only in Japan.

Configuration • Specifications

LAPTRON 75R



| | |
|------------------------|---|
| Product number | LAP-75R-100CS (100-120V)* LAP-75R-200CS (200-240V)* |
| Input | AC100-120V/200-240V 50/60Hz |
| Output | 55W max |
| Supersonic oscillation | 22~26kHz 4-stage selection (With automatic frequency following function) |
| Amplitude Range | MAX 45μm |
| DC Motor | DC3~30V |
| No-load rotation speed | 3,000~30,000rpm |
| Maximum torque | 6.5N/cm |
| Dimensions | Power unit : W285mm×D210mm×H145mm Supersonic handtool : Φ41mm Rotary handtool : Φ31.6mm |
| Weight | Power unit : approx.5.7kg Supersonic handtool : approx.356g Rotary handtool : approx.270g |

*No performance difference due to voltage.

Standard set



*Wood chips are sold only in Japan.

| | |
|-------|---------------------------------------|
| Tip | ① Metal Bond-Diamond Tips GM406 #400 |
| | ② Metal Bond-Diamond Tips GS408 #400 |
| | ③ Metal Bond-Diamond Tips GS406 #400 |
| | ④ Metal Bond-Diamond Tips GS208 #200 |
| | ⑤ Metal Bond-Diamond Tips GS206 #200 |
| | ⑥ Metal Bond-Diamond Tips SL404S #400 |
| | ⑦ Super Stone SB110 L45 #800 |
| | ⑧ Super Stone SB106 L45 #800 |
| | ⑨ Super Stone SB102 L45 #800 |
| | ⑩ Super Stone SBD3 L50 #800 |
| | ⑪ Super Stone SBD2 L50 #800 |
| Chuck | ⑫ KBL ⑭ NE31 ⑮ NE54 ⑯ GTA10 ⑰ NE24 |

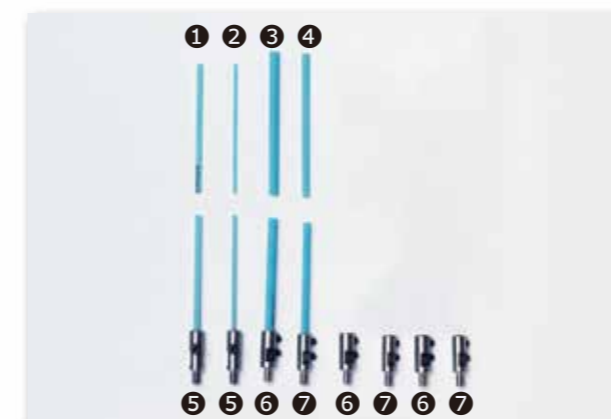
LAPTRON μ MYU



| | |
|------------------------|--|
| Product number | LAP-my-100CS (100-120V)* LAP-my-200CS (200-240V)* |
| Input | AC100-120V/200-240V 50/60Hz |
| Output | 13W max |
| Supersonic oscillation | 30 k Hz Non step output adjustment |
| Dimensions | Power unit : W236mm×D160mm×H105mm Supersonic handtool : φ20mm |
| Weight | Power unit : approx.2.3kg Supersonic handtool : approx.57g |

*No performance difference due to voltage.

Standard set



*Wood chips are sold only in Japan.

| | |
|-------|---------------------------------|
| Tip | ① Super Stone SB102 L45 #800 |
| | ② Super Stone SB103 L45 #800 |
| | ③ Super Stone SBD3 L50 #800 |
| | ④ Super Stone SBD2 L50 #800 |
| Chuck | ⑤ TNE-1 ⑥ PNE-30 ⑦ PNE-25 |

LAPTRON S



| | |
|------------------------|--|
| Product number | LAP-S-100CS (100-120V)* LAP-S-200CS (200-240V)* |
| Input | AC100-120V/200-240V 50/60Hz |
| Output | 13W max |
| Supersonic oscillation | 20 k Hz Non step output adjustment |
| Dimensions | Power unit : W236mm×D160mm×H105mm Supersonic handtool : φ23mm |
| Weight | Power unit : approx.2.3kg Supersonic handtool : approx.110g |

*No performance difference due to voltage.

Standard set



| | |
|-------|--------------------------------|
| Tip | ① Super Stone SB106 L45 #800 |
| | ② Super Stone SB104 L45 #800 |
| | ③ Super Stone SB102 L45 #800 |
| | ④ Super Stone SBD3 L50 #800 |
| | ⑤ Super Stone SBD2 L50 #800 |
| Chuck | ⑥ STA11L ⑦ SNE31 ⑧ SNE24 |