

WHICH STYLUS SHOULD I CHOOSE?

Practical advice according to the marking technology and application constraints

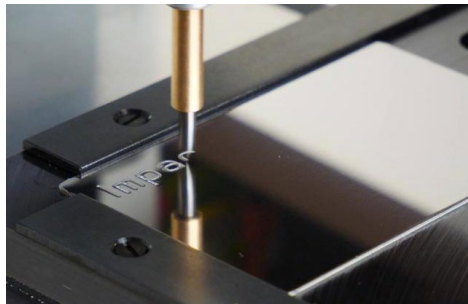
Choosing the right stylus is an essential step in ensuring the quality and durability of the marking. We offer a complete range of styli, adapted to each marking technology: pneumatic dot peen, electromagnetic dot peen and scribing.

At Gravotech, the styli used for dot peen and scribing machines follow specific naming rules, making it easy to deduce their characteristics (piston size, type, radius and angle of the pin, etc.) as well as their applications.

Through this guide, discover how to select the stylus best suited to your needs, depending on the technology of your machine.



Electromagnetic dot peen stylus



Pneumatic dot peen stylus



Scribing stylus

WHAT CRITERIA INFLUENCE THE CHOICE OF A STYLUS?

The angle of the pin
(dot peen and scribing)

An acute angle (e.g. 60°) allows precise and deep marking, particularly in soft materials; an obtuse angle (e.g. 120°) produces a wide marking, with low wear and low risk of breakage, suitable for rough surfaces.

The radius of the pin
(pneumatic dot peen and scribing)

The smaller the radius, the finer the pin's tip, which promotes precision but reduces pin durability on hard materials. A larger radius allows for wider marking, especially on rough surfaces.

The size of the piston
(pneumatic dot peen and scribing)

It determines the impact force and the depth of the marking; a larger piston is suitable for deep markings, while a smaller piston is suitable for fine characters or soft materials.

How to choose an electromagnetic dot peen stylus?

CRITERION 1: THE TYPE OF STYLUS




| Stylus | Compatible machine | Features |
|------------|-----------------------|---|
| M1L | XF510m, XF530m | Versatile, reinforced spring, part detection (option) |
| M2S | Impact m, Impact eZ m | Very durable, compatible with probing system |
| M2X | XF530m | Marking depth |

Each electromagnetic dot peen stylus begins with an "M", then other characters depending on their machine compatibility.

All pins used in electromagnetic styli are hardened (HRS*).

*HRS: Hot Rolled Steel

CRITERION 2: THE ANGLE OF THE PIN

| Angle | Result |
|--|---|
|  60° | Small characters, deep marking in soft materials |
|  90° | Standard angle, versatile and best compromise between marking width and depth. |
|  120° | Wide marking, recommended for rough surfaces, low wear, low risk of breakage and better angle for Datamatrix and OCR* with adequate lighting. |

*OCR: Optical Character Recognition

Example

Dot peen stylus
electromagnetic



How to choose a pneumatic dot peen stylus?

CRITERION 1: THE TYPE OF STYLUS






| Denomination | Characteristic | Marking area |
|--------------|--------------------|-------------------------------------|
| S | Standard | Easy to access |
| SA | Extended | Hard to reach (ex.: cavity) |
| SSA | Super extended | Very hard to reach |
| SAA | Enhanced amplitude | Multiple areas of different heights |

Each pneumatic dot peen stylus begins with an "S", then possibly other letters depending on the type of stylus.

It is possible to order a stylus with a reinforced tip (HRS*), to do this: add a "+" to the end of the stylus name. Example: S12 60° +

*HRS: Hot Rolled Steel

CRITERION 2: PISTON SIZE




| Size | Diameter | Application |
|-----------------|---|--|
| Piston 0 |  ∅ 6.65 mm | Soft materials, small print |
| Piston 1 |  ∅ 10.00 mm | Fine marking |
| Piston 5 |  ∅ 13.70 mm | The most versatile of all (equivalent to a size 1.5) |
| Piston 2 |  ∅ 16.25 mm | Deep marking on rough surfaces |
| Piston 4 |  ∅ 36.55 mm | Very deep marking (only for XF530p) |

If the choice of piston is not restrictive, we recommend selecting piston 5.

CRITERION 3: THE RADIUS OF THE PIN

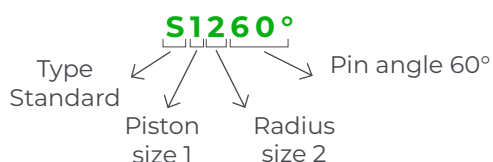
| Size | Radius | Application |
|----------|--------|---|
| 1 | 0,1 mm | Small, precise and light marking |
| 2 | 0,2 mm | Standard marking |
| 3 | 0,5 mm | Wide marking, rough surface (only for XF530p) |

CRITERION 4: THE ANGLE OF THE PIN

| Angle | Result |
|--|--|
|  60° | Standard and accurate, except for 2D code marking |
|  90° | Versatile and best compromise between marking width and depth |
|  120° | Large marking, low wear, better angle for camera reading (with adequate lighting). Recommended for parts that will have post-marking treatment (galvanization or painting) |

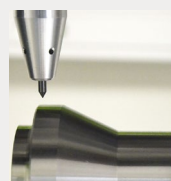
Example

Pneumatic dot peen stylus*



*Please note, not all combinations of piston type, size, angle and pin radius exist.

FOCUS - 3D STYLUS



The 3D stylus allows precise marking on surfaces with height variations or complex shapes.

[Find out more here](#)



How to choose a scribing stylus?

CRITERION 1: THE TYPE OF STYLUS

| Type | Characteristic | Common usage |
|------------|------------------------|--------------------------------------|
| N | Standard | Easy-access marking area |
| NA | Extended | Hard to reach area (e.g.: cavity) |
| ND | Diamond pin* | Hard material |
| NDA | Diamond + extended pin | Hard to reach area and hard material |
| V | Specific to SV530 | Deep marking and VIN |

The scribing styli are identified by a reference starting with "N" or "V" (in the specific case of the SV530 machine), other letters then specify their characteristics.

*Diamond pins are harder than standard pins, and are not recommended for Datamatrix marking.



CRITERION 2: PISTON SIZE

| Size | Diameter | Application |
|------------------|--|--------------------------------|
| Piston 0 |  ∅ 12.9 mm | Standard |
| Piston 1 |  ∅ 19.8 mm | Stronger than standard |
| Piston 2 |  ∅ 27.4 mm | For deep markings |
| Piston V2 |  ∅ 44.8 mm | For very deep markings and VIN |

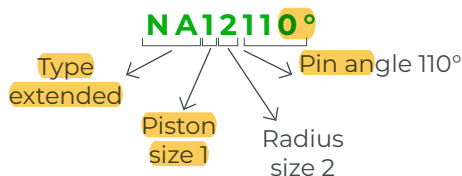
CRITERION 3: THE RADIUS OF THE PIN

| Size | Radius | Characteristic |
|----------|--------|---|
| 2 | 0,2 mm | Sharp and fine marking |
| 7 | 0,7 mm | Anti-burr for cleaner but shallower marking |

CRITERION 4: THE ANGLE OF THE PIN

| Angle | Result |
|--|---|
|  110° | Standard, versatile and very readable |
|  130° | Wide marking, low wear (only for SV530) |

Example
Scribing stylus*



*Please note, not all combinations of piston type, size, angle and pin radius exist.

Do you need more information?

Contact a Gravotech expert

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