

# Countersinking/Counterboring tools

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## General Product Description

The countersinking/counterboring tools for Hardox® wear plate are premium tools developed specifically for machining Hardox® wear plate. The tools are made of an extremely tough material that makes them very suitable for unstable conditions. The interchangeable system has been designed specifically to save both time and money in the workshop.

The tool builds on an interchangeable system with four different components:

- Tool holder – Cylindrical tool holder for morse taper shank, very stable thanks to short overhang. Also available with Weldon shank upon request.
- Countersink/Counterbore tool
- Pilot - with minimum risk of breakage from heat generation thanks to tolerances as low as c9. Good stability due to control of radial forces
- Replaceable inserts that are thicker than standard inserts for increased rigidity, better wear resistance that can stand higher feed rates. Special grade and coating

## Key Benefits

- Excellent performance in Hardox® wear plate. Long lasting due to narrow tolerances and extremely tough material.
- All parts are replaceable within seconds and can be combined in many different ways, to lower the cost of different functionalities for the user.
- Very low cost per hole
- Shorter production time to create holes and low tool cost as the inserts have 3 cutting edges and therefore last 3 times longer than conventional solutions

## Typical Machines

The countersinking/counterboring tools for Hardox® wear plate have been designed to work extremely well with manual radial and/or pillar drills but also work very well in CNC machines. Typically a morse cone tool holder is suitable for manual radial and pillar drills whereas Weldon tool holders work well in most CNC machines.

## Standard Size

### Standard Diameters

Standard range from sizes M10 to M30 i.e. from 18 mm up to 48 mm. As an example M10 indicates that the hole will be big enough to countersink a screw of size M10. More information about the measurements can be found below.

Given that the different parts of the kits can only be combined in certain ways, SSAB strongly

recommend first-time users to purchase a complete kit in order to receive parts that are combined correctly.

**Relevant measures (mm) for M10 – M24/M30.  
Countersinks/Counterbores kit for Hardox® wear plate.**

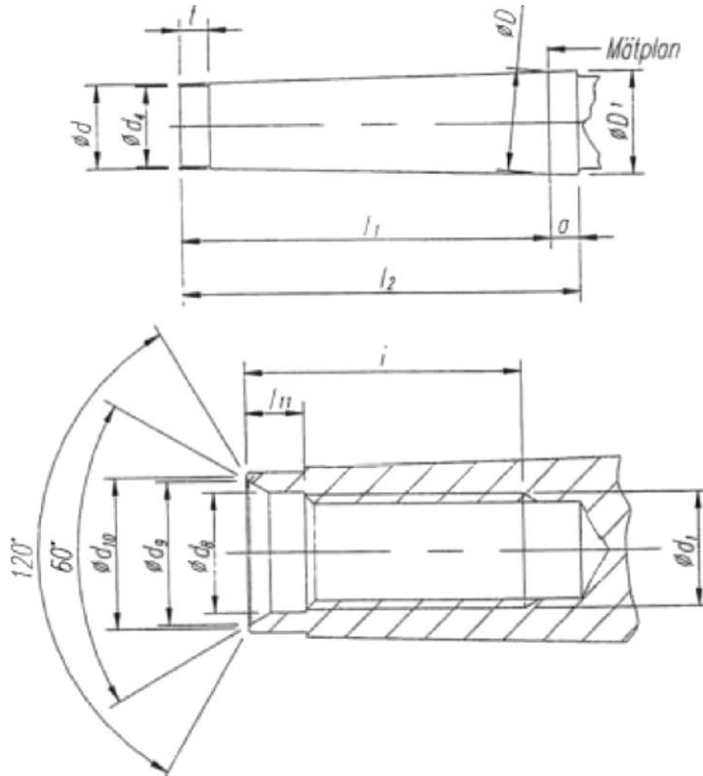
Screw/bolt size	Hole diameter	Counter-sink diameter	Counter-sink max depth	Counter-bore diameter	Counter-bore max depth
M10	11	20,5	40	18	22
M12	14	26	65	20	40
M14	16	30	65	25	65
M16	18	32	84	26	65
M20	22	38	84	33	65
M24	26	40	84	40	84
M30	32	-	-	48	84

Other dimensions as well as non-standard designs are available upon special requests.

### Tool holder

Morse cone sizes range from MK2 to MK4. See table below for more details in mm. Please note that adapters can be used if the morse taper of the machine does not match the tool holder.

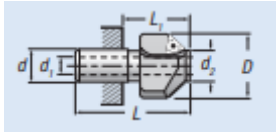
If tool holder is supplied as a separate item (not in kit) please verify with SSAB for correct size.



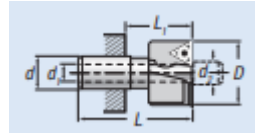
		MK1	MK2	MK3	MK4
Cone		1:20,047	1:20,020	1:19,922	1:19,254
D		12,065	17,780	23,825	31,267
a		3,5	5,0	5,0	6,5
D1		12,2	18,0	24,1	31,6
d1		M6	M10	M12	M16
d		9,4	14,6	19,8	25,9
d4	Max	9	14	19	25
d8		6,4	10,5	13,0	17,0
d9		8,0	12,5	15,0	20,0
d10	Max	8,5	13,2	17,0	22,5
l1	Max	53,0	64,0	81,0	102,5
l2	Max	57	69	86	109
l11		4,0	5,0	5,5	8,2
i	Min	16	24	24	32
t	Max	5	5	7	9

## Tools

The countersinking tool has a 90 degree angle as a standard but other angles may be obtainable upon request. It should always be combined with a rotating pilot.



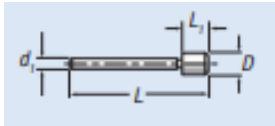
Sizes M10-M24



Sizes M10-M30

## Pilot

Ranges from 11 mm to 32 as standard products. Other dimensions available upon request.



Note! SSAB always recommend a pilot even if the holes are plasma- or laser cut which normally gives a heel inside the hole. Try using a 0.5 -1.0 mm smaller pilot in these cases.

## Inserts

Three-sided inserts attached with a central screw. Two inserts required per tool.



## Classification

ISO 3293:2016

DIN 373

## Machining recommendations

### Machining recommendations

See Machining recommendations for Strenx™ performance steel and Hardox® wear plate available at <https://www.ssab.com/download-center>

Note that coolant is necessary for good tool life when machining.

Reduce the cutting data with approx. 30% when countersinking.

## Delivery Conditions

### Standard package

The tools are delivered in plastic containers in a cardboard box. The package and the tools are clearly marked with item descriptions.

## Other Recommendations

### Safety

Always follow the safety precautions from your machine manufacturer.

Do not use the tools in above Hardox® 500 when used in unstable machines!

Follow the machine settings recommended (see Machining recommendations above).

### Mounting instructions

1. Unscrew locking screws on tool holder
2. Insert Countersink/Counterbore into tool holder
3. Insert Pilot into Countersink/Counterbore with the flat side facing towards locking screws
4. Tighten locking screws
5. Ensure small gap of 1mm between pilot head and countersink/counterbore
6. Mount indexable inserts into Countersink/Counterbore with either Center-lock screw or Clamp (Depending on insert) **Do not use both.**
  - a. Use clamp for TPMR style inserts
  - b. Use Center-lock screw for TPMT style inserts

## Contact information

[www.ssab.com/contact](http://www.ssab.com/contact)