Parts and More Compact Picks

GENERATION X and GENERATION Z
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YOU CAN’T DO WITHOUT THEM

Picks have played a decisive role in WIRTGEN’s milling technology for more than 50 years. During the milling process they loosen the pavement and granulate it to produce small pieces of reusable material. The wide variety of conditions and load cases dealt within everyday operation on the job site demand and promote continuous cutting tool development.

OPTIMISED WIRTGEN CUTTING TECHNOLOGY

Based on information and data collected in practice it can be seen that for cutting technology, in particular, productivity and economic aspects are becoming increasingly relevant. In addition to increasing the pick service life, the focus is on increasing machine productivity in particular, and minimising the ensuing operating costs. In view of these requirements, the WIRTGEN cutting technology shall be continuously optimised.
HIGH EFFICIENCY PAYS OFF

Economic efficiency, defined as the ratio of success achieved to the invested means, is dependent on numerous factors, even for complex construction machinery. For WIRTGEN, the cutting technology, and especially the pick, is of central importance.

The formula “A low pick price results in greater economic efficiency” does not work here. It depends on the correct interaction of pick and machine. The pick type and the geometry must be matched to the machine’s task.

PARTS AND MORE COMPACT
PICKS GENERATION X AND GENERATION Z

This brochure gives you the opportunity to familiarise yourself with the wide variety of WIRTGEN road milling, recycler and stabilising picks, and to find the most economical alternative for any given site situation.

Enhance your knowledge of WIRTGEN cutting technology and find out more about GENERATION X picks for road milling machines and GENERATION Z picks for cold recycling and stabilising.
COMPETENT PARTNERSHIP

When construction machine and tool manufacturers pool their expertise, this has many benefits for you as the customer.

WIRTGEN and BETEK developed the first road milling pick in cooperation in 1982. Since then, both companies have utilised their experience to continuously develop the picks.

The head office of BETEK GmbH & Co. KG is located in Aichhalden in the Black Forest and forms part of the SIMON group of companies founded in 1918.

> Sintering the carbide tips at extremely high temperatures
The close cooperation of the two system partners enables us to quickly react to our customers’ wishes and suggestions. Development, construction and manufacture of various cutting tools at BETEK, perfectly matched to different machine types of WIRTGEN, ensure maximum performance of the WIRTGEN equipment.

**This close cooperation shows:** Due to their individual design, picks are not typical third party products. Only in combination with the corresponding, highly specialised WIRTGEN machines can this regularly give the optimum milling result with maximum productivity.

The combination of both these areas of expertise forms the basis for the best possible service and greatest economy of your machines in daily use.
Picks for road milling machines, recyclers and stabilisers usually consist of five components:

- Carbide tip (see fig. 1)
- Brazing (see fig. 2)
- Steel body (see fig. 3)
- Wear plate (see fig. 4)
- Clamping sleeve (see fig. 5)

The design varies between the different types of pick, as they are intended for a very wide range of applications. The components and their function, however, are always identical.
Exploded view
W6/20X
TUNGSTEN CARBIDE AND COBALT WITH A PERFECT BOND

The carbide in our tips is a composite material made from tungsten carbide and cobalt.

While the tungsten carbide provides extreme hardness and resistance to wear, the comparatively “soft” cobalt bonds the tungsten carbide particles to ensure maximum breaking strength under even the greatest stresses.

The balanced mixture of different particle sizes of the tungsten carbide largely determines the wear of the tips. The fine particles ensure high wear resistance, while the coarse particles provide the necessary breaking strength and temperature resistance. The incorrect mixing ratio of coarse and fine particles causes increased wear in the high-temperature cutting process, which results in premature failure of the tool.

Stringent quality controls at BETEK ensure the consistent and correct mixing ratio.

The quality of the carbide determines the service life of the pick, and consequently also the machine availability, its milling performance and the quality of your site operations.
1 > Cobalt (light grey) bonds with the tungsten carbide grains and provides impact resistance

2 > Tungsten particles (dark grey) are very hard and ensure wear resistance
HIGH PRODUCTIVITY DURING THE CUTTING PROCESS

The cap-shaped carbide tip has been remodelled to suit the further development of GENERATION X. The picks of this generation have been developed as far as possible for milling asphalt. Due to the material characteristics of asphalt, the known geometry of the carbide could be reworked for more efficient utilisation.

A comparison of carbide tips (right) shows that GENERATION X displays a highly cylindrical component in the upper region of the tip. Above all, this construction optimises the duration of the cutting performance in comparison to carbide tips commonly available on the market. The result is more constant machine productivity, an improved cost-performance ratio, and an increased service life of the picks.

Picks with cylindrical carbide tips are classified as GENERATION X if they have an identical carbide quality (non geometry).
Cap-shaped carbide tip, precursor model

Cylindrical carbide tip

GENERATION X size W6
HIGH PRODUCTIVITY DURING THE CUTTING PROCESS

A direct comparison of the carbide tips demonstrates the principal differences at a glance. The total wear margin of both carbide tips is 9.7 mm. However, if we compare them at 50% of the wear margin, approx. 4.85 mm, it is clear that 16.9% more carbide remains in the upper section in the case of the GENERATION X W6 tip than on the comparable model, even though the carbide tip weight is identical in each case (see figures below: green marked area). The greater volume hinders lengthwise wear and the service life of the pick is increased.
Practice tests emphasise the advantages of GENERATION X, pointing out that the optimised carbide tip geometry combines the reduced cutting forces of a cylindrical tip with the protection function of the cap-shaped carbide. The excellent cutting performance over approx. 3/4 of the carbide tip’s service life (see figure below: Comparison between the common cap shape and GENERATION X) results in the high machine advance rate and productivity.
HIGH LEVEL OF RESISTANCE UNDER IMPACT LOAD

The direct comparison between the carbide tips of the previous model of stabiliser and recycler pick and GENERATION Z:

Although both carbide tips have an identical base (also referred to as base diameter), and their design is almost identical, the difference is in the carbide quality. In picks of GENERATION Z, the cobalt content has been significantly increased, whereby the carbide tip is significantly more resistant to breakage against high impact loads.

In the case of the W6 tip of GENERATION Z, the carbide base (cap) has also been reinforced to additionally increase load capacity.

> Design of the carbide tips in comparison
Last but not least, the optimised quality of GENERATION Z carbide tips for recycling and stabilisation applications allows an increased impact stress (i.e. from pieces of rock). The higher proportion of cobalt achieves an optimal balance between hardness (wear resistance) and toughness (resistance to enormous impact stress peaks) for the specified application areas.

Example of a slightly compact soil with pieces of rock
The careful brazing of the tungsten carbide tip and the steel body ensure the firm bond of the materials.

LINK BETWEEN PICK BODY AND CARBIDE TIP

The carbide tips are brazed firmly to the steel body. As soon as the enormously high temperatures generated during the milling process act on the components, the carbide in the tip and the steel of the pick head are subject to differential expansion. A brazing method developed in-house is used, which under the effect of heat ultimately determines the hardness of the pick head.

This is confirmed by numerous stress tests: Even under enormous pick stresses, no breakage occurs. The carbide tip and steel body hold firmly together.
Using a specially configured device, test picks are removed from current production in order to test the durability of the braze for quality control purposes.
The pick head must withstand enormous shear forces and impact stresses. At the same time, the pick must sit firmly and unbreakably in the toolholder throughout its complete service life. WIRTGEN picks have a steel body which perfectly combines the two properties of wear resistance and breaking strength.

> Put to the test: A 300 kg weight hits the pick from a height of 1.5 m
In a tried and tested process different grades of pick head and shaft hardness are produced: While the tough pick shaft absorbs the forces occurring in the area of the toolholder, the pick head undergoes extra hardening, making it particularly wear-resistant in direct contact with the milling material.

The relationship of hardness to toughness of the pick head and shaft largely determines the service life and usability of the pick.

> Steel body of an W6/20X
OPTIMAL TOOLHOLDER PROTECTION

Wear protection: The design of the wear plate plays a crucial role for the wear state of the toolholder. WIRTGEN picks are therefore provided with a wear plate with an outer plate diameter of 45 mm, exactly matched to the toolholder. It completely covers the upper part of the toolholder and thus absorbs a large proportion of the wear and tear.

WIRTGEN picks are optimised on the basis of requirements and experience gathered on site. The wear plate has a thickness of 5 mm. It has been reinforced at the outer edge with an additional 2 mm to 7 mm. This feature ensures longer and better toolholder protection compared to conventional wear plates.

> Shape of the wear plate of GENERATION X and GENERATION Z
The forged wear plate of all WIRTGEN picks has a chamfer on the underside.

This chamfer is very pronounced to transfer the shear forces generated during the cutting process far better. In addition to the improved pick centering, the acting shear forces are effectively transferred to the toolholder system.

**The installation aid:** In the delivery condition, the clamping sleeve of the pick is pre-tensioned by the wear plate. Therefore, only a few operations are required to install the pick ready for use.
LARGE CONTACT SURFACE

The cone’s contact surface on the underside of the wear plate is 114.5 mm². This enlarged surface effectively transfers the shear forces generated during the cutting process.

Shear forces generated during cutting process: The rotary movement of the pick required to achieve optimum (radial) wear and the shear forces (tipping movement) generated during the cutting process allow milled material particles to penetrate into the gap between the toolholder and the wear plate, depending on the respective application. For example, asphalt particles promote lengthwise wear on the toolholder as a result of their abrasive properties.
Thanks to the extremely pronounced cone on the underside of the wear plate, the tipping movement is greatly reduced. This means that less dirt particles penetrate into the gap (between the wear plate and the toolholder contact area). However, in addition to the reduced risk of pick fracture, primarily the toolholder service life is significantly increased in terms of lengthwise wear.

In addition to their other properties the WIRTGEN pick wear plates reduce lengthwise toolholder wear.

> Heavily worn toolholders as a result of the massive penetration of dirt caused by the tipping movement during the cutting process. Cause: Picks with an excessively small cone on the underside of the wear plate were used.
STRONG HOLD AND QUICK REPLACEMENT

Thanks to its exact roundness, the Twin-Stop clamping sleeve ensures optimum pick rotation characteristics for GENERATION X and GENERATION Z picks. The Twin-Stop function with an upper and lower stop collar enables the clearly defined lengthwise play of the pick under the changing stresses during the cutting process. This dramatically reduces the risk of damage to the sleeves and/or the number of pick breakages.

The clamping sleeve for the current range of picks has a wall thickness of 1.25 mm and has therefore been reinforced throughout. This optimization significantly extends the possible use of the shaft-sleeve joint.

The comparatively high hardness of the clamping sleeve ensures a high clamping force, which counteracts premature failure in even the most demanding applications. A special surface treatment protects the sleeve against corrosion and therefore ensures straightforward pick removal.

1 > The Twin-Stop clamping sleeve with improved rotation characteristics

2 > Conventional clamping sleeve with an axial stop in the unprotected area

3 > Twin-Stop stops in the protected area for reduced wear
The holding force is great enough to guarantee a reliable milling process in every situation, and simultaneously low enough to allow uncomplicated and quick pick replacement.
WEAR OF PICKS

REASONS AND TIPS FOR MAINTENANCE

All elements of a pick are subject to more or less wear depending on the material to be milled. In case of excessive fatigue on one of the components, e.g. the carbide tip, the steel body, the wear plate and/or the clamping sleeve, the pick should be replaced to prevent or reduce consequential damage to the more expensive toolholder system, which is also more complex to replace.

Dirt, incorrect installation or elements from different manufacturers that are not identical will degrade not only the productivity and/or milling performance, but can even result in irreparable damage to the original components.

The most common reasons for unusually short pick service lives include:

> Coatings and accumulations of old milled material, generally from ineffective cleaning
> Selection of the wrong pick (see usage recommendations, pages 54 to 59)
> Inadequate supply of water by the sprinkler system in the milling drum housing

WHAT IS WEAR?

Wear is produced by a pressure of two elements on one another (e.g. of carbide tip and material to be milled) when there is relative movement. When this happens small particles become detached from the surface of both elements.
HOW CAN WEAR BE AVOIDED?

Wear on picks cannot be prevented entirely, but at best minimised.

An adequate water supply is an important basic prerequisite to ensure the necessary rotation of the picks.

The selection of the correct pick (depending on the substrate to be milled) also optimises the use and reduces the wear.

**Increasing service life means**

- Paying attention to thorough, daily cleaning,
- Regularly inspecting the picks so that wear or damage to components can be tackled in good time,
- Regularly maintaining and checking the sprinkler system and
- Selecting the cutting tools to suit the application.

**Correct installation of the picks**

- Check the amount of dirt and the possible need for cleaning of the toolholder bore prior to the actual installation.
- Usage of appropriate tools to prevent damage to the carbide tip (copper hammer or pneumatic insertion tool).
- Manual inspection of the pick rotation (turning the pick by hand).
In the three functional examples given the same milling drum type is used. The diameter of the cutting circle is 1140 mm, the milling drum operating speed is 98 revolutions per minute. As can be seen in the illustrations and data, the maximum advance (V) of the road milling machine reduces with increasing cutting depth (A) (see pages 32 to 33).

To explain: In figure 1 the cutting depth is 50 mm. Referred to the circumference of the milling drum the percentage of picks in contact is 11%. An advance performance of approx. 30 m/min is achieved. For comparison: In figure 3 the cutting depth is 300 mm. 18% of the milling drum circumference is in the cut, which has the consequence that the engine power applied is distributed over a greater number of picks and as a result the machine advance is reduced.

Given constant ambient conditions (machine, milling material, pick type, etc.) the milling depth (A) has a direct effect on the advance of the machine. Accordingly, the volume of comma-shaped chips milled also changes as a function of the machine parameters described above. The maximum milling material volume performance is achieved at a medium milling depth.

The relationship between cutting depth and advance performance can also be read from the resulting chip length. The deeper the cut, the longer the contact friction with the compacted substrate lasts. The duration of the friction results in higher wear.
## Cuttings Length and Chip Volume

<table>
<thead>
<tr>
<th>Cutting process</th>
<th>Milling depth (A)</th>
<th>Remaining web height (B)</th>
<th>Rotations per minute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1</td>
<td>50 mm</td>
<td>18.56 mm</td>
<td>approx. 98</td>
</tr>
<tr>
<td>Figure 2</td>
<td>150 mm</td>
<td>2.38 mm</td>
<td>approx. 98</td>
</tr>
<tr>
<td>Figure 3</td>
<td>300 mm</td>
<td>1.1 mm</td>
<td>approx. 98</td>
</tr>
<tr>
<td>Advanced speed</td>
<td>Total circumference of the milling drum</td>
<td>Length of the contact friction (circumference in cutting process)</td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>----------------------------------------</td>
<td>-----------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>approx. 30 m/min</td>
<td>approx. 3700 mm</td>
<td>approx. 408 mm (11%)</td>
<td></td>
</tr>
<tr>
<td>approx. 10 m/min</td>
<td>approx. 3700 mm</td>
<td>approx. 474 mm (14%)</td>
<td></td>
</tr>
<tr>
<td>approx. 5 m/min</td>
<td>approx. 3700 mm</td>
<td>approx. 632 mm (18%)</td>
<td></td>
</tr>
</tbody>
</table>
The correct assessment of the wear to WIRTGEN picks is an essential requirement for smooth and efficient project handling. Replacing a pick at the right time guarantees successful working, and ultimately also reduces operating costs significantly. Using the measured lengthwise wear on picks with a cap-shaped carbide tip (check dimension “B”), conclusions on the penetration capacity of the pick in the material to be milled can be drawn. The more advanced the wear (the overall length of the pick decreases, compare dimension “A” to dimension “B”), the lower is the penetration capacity. In addition to a reduced machine advance rate, this effect is reflected in substantially lower productivity.

Numerous influencing factors must be taken into consideration when assessing the condition of picks: from climatic conditions through milled material, machine performance and machine advance speed to proper maintenance. Wear patterns and observation of the maximum wear lengths help to avoid missing the correct replacement time, and prevent typical errors in applications.
## OPTIMUM WEAR

<table>
<thead>
<tr>
<th>Pick designation</th>
<th>Part No.</th>
<th>Pick new (dimension A)</th>
<th>Pick worn out (dimension B)</th>
<th>Wear path (dimension C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>W1-8/13</td>
<td>193701</td>
<td>54.2</td>
<td>43.6</td>
<td>10.6</td>
</tr>
<tr>
<td>W4/13</td>
<td>182598</td>
<td>54.2</td>
<td>44.5</td>
<td>9.7</td>
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<tr>
<td>W1-10-G/20X</td>
<td>2218466</td>
<td>88</td>
<td>68.2</td>
<td>19.8</td>
</tr>
<tr>
<td>W1-10-NG/20X</td>
<td>2218467</td>
<td>88</td>
<td>68.2</td>
<td>19.8</td>
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<tr>
<td>W1-13-G/20X</td>
<td>2281964</td>
<td>88</td>
<td>69.8</td>
<td>18.2</td>
</tr>
<tr>
<td>W4-G/20X</td>
<td>2308094</td>
<td>88</td>
<td>78.3</td>
<td>9.7</td>
</tr>
<tr>
<td>W5L/20X</td>
<td>2314701</td>
<td>89.5</td>
<td>79.8</td>
<td>9.7</td>
</tr>
<tr>
<td>W5-L/G/20X</td>
<td>2308097</td>
<td>89.5</td>
<td>79.8</td>
<td>9.7</td>
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<tr>
<td>W6/20X</td>
<td>2308098</td>
<td>88</td>
<td>78.3</td>
<td>9.7</td>
</tr>
<tr>
<td>W6-G/20X</td>
<td>2308099</td>
<td>88</td>
<td>78.3</td>
<td>9.7</td>
</tr>
<tr>
<td>W6L/20X</td>
<td>2314699</td>
<td>88</td>
<td>76.1</td>
<td>11.9</td>
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<td>W6-L/G/20X</td>
<td>2314698</td>
<td>88</td>
<td>76.1</td>
<td>11.9</td>
</tr>
<tr>
<td>W6M/20X</td>
<td>2308100</td>
<td>88.6</td>
<td>78.2</td>
<td>10.4</td>
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<tr>
<td>W6ML-G/20X</td>
<td>2314700</td>
<td>89.5</td>
<td>76.2</td>
<td>13.3</td>
</tr>
<tr>
<td>W7/20X</td>
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<td>12.1</td>
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<tr>
<td>W7-G/20X</td>
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<td>88</td>
<td>75.9</td>
<td>12.1</td>
</tr>
<tr>
<td>W8/20X</td>
<td>2308104</td>
<td>88</td>
<td>75.2</td>
<td>12.8</td>
</tr>
<tr>
<td>W8-G/20X</td>
<td>2308105</td>
<td>88</td>
<td>75.2</td>
<td>12.8</td>
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</table>

### Dimensions in mm

<table>
<thead>
<tr>
<th>Pick usage for road milling machines</th>
</tr>
</thead>
<tbody>
<tr>
<td>W6 / 20Z</td>
</tr>
<tr>
<td>W6C / 20Z</td>
</tr>
<tr>
<td>W1-13 / 22Z</td>
</tr>
<tr>
<td>W1-17 / 22Z</td>
</tr>
<tr>
<td>W6 / 22Z</td>
</tr>
<tr>
<td>W6C / 22Z</td>
</tr>
<tr>
<td>W8 / 22Z</td>
</tr>
<tr>
<td>W1-13 / 25Z</td>
</tr>
<tr>
<td>W6C / 25Z</td>
</tr>
<tr>
<td>W8 / 25Z</td>
</tr>
</tbody>
</table>
PICKS WITH A CYLINDRICAL CARBIDE TIP

The figure shows an optimally worn pick with optimum rotation; the length is completely worn.

Picks with a cylindrical carbide tip can be used until they reach the upper edge of the puller groove which is also a wear marking. When this marking is reached the carbide is worn to its maximum.
This shows an example of an ideally worn pick. This can be seen from the carbide tip worn to the maximum and the even radial wear to the pick head.
WEAR EXAMPLES
UNDESIRED WEAR

STEEL BODY WASHING OUT

Condition: The steel body and wear plate are already severely worn in comparison to the carbide tip. The pick demonstrates optimum rotation.

Cause and effect: One possible cause for this form of wear is a high advance speed with soft milling material. These conditions usually lead to washing out at the pick head and reduced wear to the carbide tip.

Solution: There are two means of minimizing this undesired wear:
> Using a pick with a larger steel body or carbide diameter
> Reduction of the machine advance speed or machine speed
CARBIDE BREAKAGE

**Condition:** Figures 1 and 2 show a carbide tip after breakage due to overload.

**Cause and effect:** There are basically two causes of a carbide breakage:

- Firstly, a mechanical overload may occur, if the ground being milled contains hard objects or materials which cannot be cut or broken, such as steel reinforcements, large rocks or drainage covers.
- Secondly, a thermal overload may be caused by excessive heat generated in the cutting process. This occurs in case of inadequate water supply in the cut of the pick.
Solution: Damage due to mechanical overload is difficult to avoid, since steel reinforcements or large rocks in the sub-strate cannot be detected before the start of milling.

- In order to prevent a thermal overload, the sprinkler sys-tem (water pump, sprinkler bar and its components, such as nozzles and filters) should be checked.
- A further possibility is to reduce the advance speed of the machine, since this, together with the drum speed, deter-mines the cutting length of the picks. The longer the cut-ting length, the greater the friction created. This ultimately also leads to overheating of the picks.
- When high impact loads are expected, a pick from GENERATION Z can also provide better results. Its low carbide hardness gains in comparison due to its significantly higher toughness and concomitant resistance when enormous impact loads occurs.
EXCESSIVE LENGTHWISE WEAR

Condition: The pick is completely worn. The maximum service life has been exceeded, because no more carbide can be seen. The toolholder has probably been severely damaged at the contact surface, since it is not protected either by a wear plate or a pick head.

Cause and effect: The pick wore out long ago, and was detected much too late.

Solution: In order not to exceed the optimum replacement time, regular checks should be carried out during occasional breaks in the milling process.
BAD ROTATION

**Condition:** On this pick with a cylindrical carbide tip, severe wear can be seen to one side of the pick head and the carbide tip. This is most probably due to inadequate rotation characteristics.

**Cause and effect:** One reason for failure can be dirt in the toolholder bore. This occurs in the event of inadequate water supply. A further cause for the bad rotation characteristics can be a severely abraded toolholder.

**Solution:** First, the general condition of the water system should be checked. It must also be ensured after dismantling the pick that the toolholder bore is cleaned, and that the toolholder contact surface is not worn on one side.
CLAMPING SLEEVE WEAR

**Condition:** The figure shows a classical clamping sleeve, which has become deformed due to its design (without Twin-Stop function) after being used for too long.

**Cause and effect:** This pick had been in use for a very long time. Even if this cannot be seen from the pick head and the carbide tip, it can always be identified from the wear of the wear plate and clamping sleeve.
Solution: For the general reduction of this risk, the Twin-Stop function (with exactly defined lengthwise play) was integrated into the WIRTGEN pick generations.
In addition to the material in question, the most important influencing factors for the milling performance are the milling depth and the machine advance speed.
A major but often overlooked detail: At different milling depths, the cutting profile of the pick and therefore the chip size of the milled material differ significantly (also see examples pages 30 to 33).

This has a direct effect on the milling performance and the wear to picks and toolholders. WIRTGEN large milling machines produce the maximum milling performance and lowest wear costs at a milling depth of from 75 mm to 150 mm.

It can therefore be said in summary that the maximum economy can be achieved at these milling depths.

In some applications, the required milling depth is greater than 200 mm; in this case, it may be well worthwhile to remove the layers in several operations (cuts), since the advance per cut is increased and the wear to the picks per cubic metre can be reduced.
### Code Meaning

<table>
<thead>
<tr>
<th>Code</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>WIRTGEN Pick</td>
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</table>

### Code for cylindrical carbide tips

<table>
<thead>
<tr>
<th>Code</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>W1-8</td>
<td>Carbide tip diameter 8 mm (length: 15 mm)</td>
</tr>
<tr>
<td>W1-10</td>
<td>Carbide tip diameter 10 mm (length: 25 mm)</td>
</tr>
<tr>
<td>W1-12</td>
<td>Carbide tip diameter 12 mm (length: 21.7 mm)</td>
</tr>
<tr>
<td>W1-13</td>
<td>Carbide tip diameter 13 mm (length: 25 mm)</td>
</tr>
<tr>
<td>W1-17</td>
<td>Carbide tip diameter 17 mm (length: 28.5 mm)</td>
</tr>
</tbody>
</table>

### Code for cap-shaped carbide tips

<table>
<thead>
<tr>
<th>Code</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>W4</td>
<td>with a base diameter 16 mm (length: 16 mm)</td>
</tr>
<tr>
<td>W5</td>
<td>with a base diameter 17.5 mm (length: 16 mm)</td>
</tr>
<tr>
<td>W5L</td>
<td>with a base diameter 17.5 mm (length: 17.5 mm)</td>
</tr>
<tr>
<td>W6</td>
<td>with a base diameter 19 mm (length: 17.5 mm)</td>
</tr>
<tr>
<td>W6L</td>
<td>with a base diameter 19 mm (length: 19.5 mm)</td>
</tr>
<tr>
<td>W6C</td>
<td>with a base diameter 19 mm (length: 10 mm)</td>
</tr>
<tr>
<td>W6M</td>
<td>with a base diameter 19 mm (length: 18 mm)</td>
</tr>
<tr>
<td>W6ML</td>
<td>with a base diameter 19 mm (length: 21 mm)</td>
</tr>
<tr>
<td>W7</td>
<td>with a base diameter 20.5 mm (length: 20.5 mm)</td>
</tr>
<tr>
<td>W8</td>
<td>with a base diameter 22 mm (length: 20 mm)</td>
</tr>
</tbody>
</table>

*Not applicable to the surface miner pick product range.*
## Characteristics of the carbide tips

<table>
<thead>
<tr>
<th>Code</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Compact</td>
<td>Carbide tip in flat version</td>
</tr>
<tr>
<td>L</td>
<td>Long</td>
<td>Carbide tip in longer version (height)</td>
</tr>
<tr>
<td>M</td>
<td>Massive</td>
<td>No matter what shape: solid carbide tips and hence higher carbide volume than standard tips</td>
</tr>
</tbody>
</table>

## Shape of the steel body (of the pick head)

<table>
<thead>
<tr>
<th>Code</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-G</td>
<td>Groove</td>
<td>Steel body with extractor groove</td>
</tr>
<tr>
<td>-NG</td>
<td>Narrow Groove</td>
<td>Steel body with extractor groove in a slim design</td>
</tr>
</tbody>
</table>

## Shank diameter data for the pick

<table>
<thead>
<tr>
<th>Shank Diameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>/13</td>
<td>Shank diameter corresponds to 13 mm</td>
</tr>
<tr>
<td>/20</td>
<td>Shank diameter corresponds to 20 mm</td>
</tr>
<tr>
<td>/22</td>
<td>Shank diameter corresponds to 22 mm</td>
</tr>
<tr>
<td>/25</td>
<td>Shank diameter corresponds to 25 mm</td>
</tr>
</tbody>
</table>

## Generation identification

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Features see pages 12-15 and 50-51</td>
</tr>
<tr>
<td>Z</td>
<td>Features see pages 16-17 and 52-53</td>
</tr>
</tbody>
</table>

Not applicable to the surface miner pick product range.
GENERATION X carbide tips

1

2

3

4

GENERATION X pick heads

5

6

7

8

GENERATION X shaft/plate

9
CARBIDE TIPS
> **Fig. 01:** Cap-shaped carbide tips with 5 different base diameters and lengths (W4, W5, W6, W7, W8).
> **Fig. 02:** Cap-shaped carbide tips in longer version have the additional designation letter L (e.g. W5L, W6L).
> **Fig. 03:** The cap-shaped carbide tips W6M has the same diameter as the W6 tip. The tips are used in special applications (soft top layer and hard substrate). The tip W6M is available in a longer version with the additional designation letter L (W6ML).
> **Fig. 04:** Cylindrical carbide tips with the code W1 are available in different sizes (for example -8, -10, -13). The number after the dash indicates the diameter of the tips in millimetres.

PICK HEADS
> **Fig. 05:** Standard-pick heads without extractor groove.
> **Fig. 06:** Pick heads with extractor groove can be identified by the additional designation letter -G (Groove - only relevant for picks with a shaft diameter of 20 mm).
> **Fig. 07:** Standard pick heads with embedded, cylindrical carbide tip.
> **Fig. 08:** Pick heads in slender version are designated by the additional letter -N (narrow - only relevant for picks with a shaft diameter of 20 mm / with additional extractor groove the designation letter is -NG).

SHAFT / PLATE
> **Fig. 09:** Pick shafts (Ø 20 mm) with Twin-Stop clamping sleeve and a reinforced wear plate. These feature an outer diameter of 45 mm.
ORIGINAL WIRTGEN
PICK SELECTION
GENERATION Z

**GENERATION Z** carbide tips

1

2

3

**GENERATION Z** pick heads

4

5

6

7

**GENERATION Z** shaft/plate

8

9

10
CARBIDE TIPS

> **Fig. 01:** Cap-shaped carbide tips with different base diameters and lengths (W6, W8).

> **Fig. 02:** The cap-shaped carbide tip W6C has the same diameter as the W6 tip. The greatly flattened tip has been specially designed for stony ground in the application area of ground stabilisation.

> **Fig. 03:** Cylindrical carbide tips with the code W1 are available in different sizes (for example -13). The number after the dash indicates the diameter of the tips in millimetres.

PICK HEADS

> **Fig. 04:** Standard pick heads for cap-shaped tips.

> **Fig. 05:** Standard pick heads for cylindrical tips.

> **Fig. 06:** Large and robust pick heads with cap-shaped carbide tip for ground stabilisation under extreme conditions (only for Ø 25 mm shaft).

> **Fig. 07:** Large pick heads with cylindrical carbide tip for ground stabilisation under extreme conditions (only for Ø 25 mm shaft).

SHAFT/PLATE

> **Fig. 08:** Pick shafts (Ø 20 mm) with Twin-Stop clamping sleeve and a reinforced wear plate. These feature an outer diameter of 45 mm.

> **Fig. 09:** Pick shafts (Ø 22 mm) with Twin-Stop clamping sleeve and a reinforced wear plate. These feature an outer diameter of 45 mm.

> **Fig. 10:** Pick shafts (Ø 25 mm) with Twin-Stop clamping sleeve and a reinforced wear plate. These feature an outer diameter of 60 mm.
### ORIGINAL WIRTGEN

#### USAGE RECOMMENDATIONS FOR GENERATION X

<table>
<thead>
<tr>
<th>Material to be milled</th>
<th>Carbide size</th>
<th>With extractor groove</th>
<th>Without extractor groove</th>
<th>Performance class, machine type</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asphalt</strong> (capped-shaped carbide tips)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W4</td>
<td>W4-G/20X #2308094</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W5L</td>
<td>W5L-G/20X #2308097</td>
<td>W5L/20X #2314701</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W6</td>
<td>W6-G/20X #2308099</td>
<td>W6/20X #2308098</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W7</td>
<td>W7-G/20X #2308103</td>
<td>W7/20X #2308102</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W8</td>
<td>W8-G/20X #2308105</td>
<td>W8/20X #2308104</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Concrete</strong> (cylindrical carbide tips)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W1</td>
<td>W1-10-G/20X #2218466</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>W1-13-G/20X #2281964</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Generally recommendable
- Recommendable

Specifications also valid for "i" machines equipped with new engine technology.

Generally recommendable

Recommendable
<table>
<thead>
<tr>
<th>Small milling machines</th>
<th>Compact milling machines</th>
<th>Large milling machines</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.35 m</td>
<td>W 100, W 120, W 150, W 150 CF</td>
<td>W 1500, W 1900, W 2000, W 200, W 20 H, W 2100, W 210, W 2200, W 220, W 250</td>
</tr>
<tr>
<td>0.5 m</td>
<td>W 60, W 100 (H), W 100 R, W 130 H</td>
<td></td>
</tr>
<tr>
<td>1 m Rear</td>
<td>W 50, W 100 (H), W 100 (L), W 100 R, W 130 H</td>
<td></td>
</tr>
</tbody>
</table>

Specifications also valid for “i” machines equipped with new engine technology.
USE IN SOIL STABILISING

**Compact soil/milled material** usually contains abrasive (grinding) materials that flow around the carbide tip and the pick head during the cutting process. In this application case, the wear to the steel body dominates, thereby limiting the service life of the tool. In this case, the job of the carbide tip is to deflect the material from the steel body (pick head), thereby reducing its wear.

For ground that contains **pieces of rock**, use of a pick with a cylindrical tip (or with a W6C tip) is recommended. In this case, the resistance to carbide breakage is the decisive factor because sudden impact stresses have to be deflected. When there are external shaft stresses on the pick, caused by massive stone/rock sizes, a pick with a 25 mm shaft diameter can be used by replacing the top section of the quick-change toolholder system.

1 > Compact soil

2 > Slightly compact soil with medium-sized pieces of rock
USE IN COLD RECYCLING AND PULVERISING

On road works, the picks penetrate under the base layer, and sometimes even deeper into the ground. Depending on the design of the roadway and the materials/additives used, it must be assumed that there will be abrasive (grinding) stone with low grain size and at least partially with tough binding elements. There are high cutting forces that can be promoted by using a carbide tip with a higher cutting performance (e.g. W6) when cutting these layers. With increased abrasiveness, the size of the carbide tip should also be adjusted. In case of larger pieces of rock, a cylindrical carbide type is recommended.
## Application

| Soil stabilising   | Cold recycling and pulverising |

## Abrasiveness (abrasive materials)

<table>
<thead>
<tr>
<th>Impact stress (Rock size / rock component increases)</th>
<th>W6 / 22Z # 2493524</th>
<th>W6C / 22Z # 2493527</th>
</tr>
</thead>
<tbody>
<tr>
<td>W6C / 25Z # 2493541</td>
<td>W1-13 / 22Z # 2493532</td>
<td>W1-13 / 25Z # 2493547</td>
</tr>
</tbody>
</table>

Further information on ordering our picks can be found in the Parts and More catalogue and online under www.partsandmore.net.
**Machine type**

- WR 2000, WR 200, WR 2400, WR 240, WR 2500, WR 2500 S, WR 250

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**Shaft diameter**

- **W8/22Z**
  - #2493530
  - 22 mm

- **W8/25Z**
  - #2493545
  - 25 mm

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* Specifications also valid for “XL” and “i” machines equipped with new engine technology

** WIRTGEN cold recycling machines and ground stabilisers are fitted at the factory with this pick type.