



ERASTEEL



ASP® is a registered trade mark of Erasteel.



Our Guarantee
Like all Erasteel products, ASP® is produced with the latest technology to provide quality, repeatability and high-performance for tool makers and tool users.



The fine, uniform microstructure of ASP® carbides ensures superior strength.



Conventionally produced HSS with a brittle carbide microstructure limits material strength.



ASP

makes
your tools
run longer

High performance combined with tool reliability

Higher cutting performance and excellent productivity can be achieved with ASP tools. The highest alloyed ASP grades developed by Erasteel with advanced coatings bridge the gap between conventional HSS and cemented carbides. In addition, ASP is a very clean steel, which significantly reduces the risk of tool failure due to non-metallic inclusions. This ensures that production proceeds smoothly, without unplanned stoppages. As result, total machining costs are reduced, making premium ASP tools a highly profitable investment.

The newest generation of ASP steel features a record-low level of inclusions, for optimum tool reliability.

An ideal material for creative tool design

The high strength of ASP steel facilitates the design of a wide range of tooth geometries and sharp edges. Moreover, processing of ASP is easier due to the fine uniform microstructure

which provides for better grindability and lower distortion during heat treatment.

Partnering for better tools

In cooperation with tool manufacturers and tool users, we participate in the development of advanced metalworking tools. Erasteel also carries out machining test programs with universities and technical centers. Based on their special expertise with ASP powder-metallurgical steels, our engineers and researchers always ensure that customers share in the latest innovations and production technologies from Erasteel.

Global coverage with local presence

Erasteel is the world's leading producer of high-speed steel. We have a strong local presence in most major markets. With a broad inventory of shapes and dimensions, we offer our customers an ASP steel that ensures the most efficient production of tools that deliver superior performance.

END MILLS

ASP opens new perspectives in milling. The quality of end mills significantly increases with ASP. The powder steel's high hardness and strength makes it especially suitable for use in most type of end mills to ensure high performance as well as safe and predictable operations.

High performance: Coated ASP end mills can be operated at a considerably higher feed rate than conventional end mills. This provides improved productivity in roughing using such grades as ASP 2030 or ASP 2052. Cutting performance can also be improved significantly in finishing operations, for instance with ASP 2060.

Cost efficiency: From an economical viewpoint major savings can be achieved, which results in a quick payback on the change to ASP.

Safe milling: An important feature for ASP end mills is the predictable operating lifetime, which simplifies planning and control of operations, particularly on unmanned NC machines.

Quality: ASP end mills are precision tools that facilitate machining with very high dimensional accuracy and improved surface finishing even with long series .



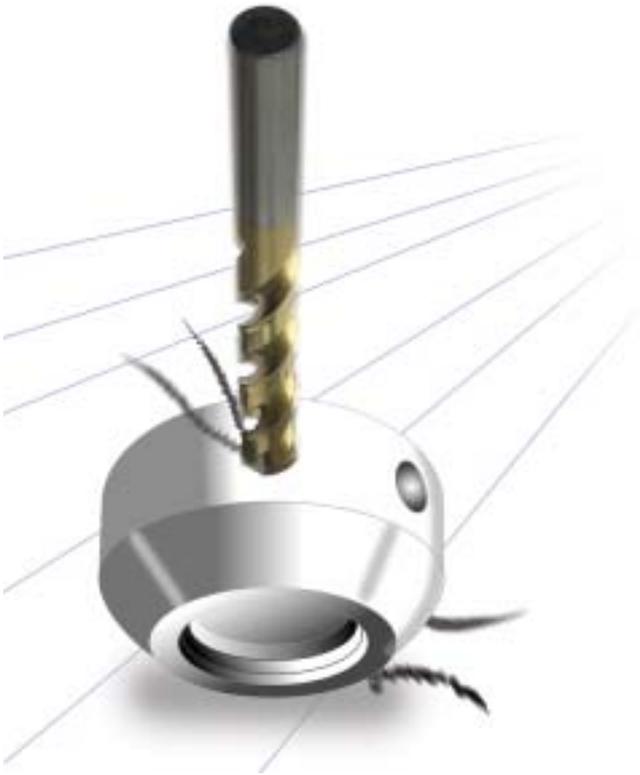
DRY END MILLING OF TOOL STEEL WITH ASP 2052

Material: Tool steel, 40CrMnMo7
 R_m 1040 N/mm²
 Operation: ASP 2052 rough end milling (HR profile), \varnothing 12 mm, Ti₂CN coating
 $v_c = 45$ m/min, $a_p = 12$ mm, $a_e = 8$ mm, $f_z = 0.03$ mm
 Wet machining: Tool life = 8.1 m, $W_c = 56.8$ W/cm³/min
 Dry machining: Tool life = 7.0 m, $W_c = 46.6$ W/cm³/min
 Benefit: Dry machining with coated ASP 2052 end mills, tool life only slightly affected compared with wet machining, but specific cutting energy was reduced

ROUGH MILLING OF INCONEL 718 WITH ASP 2052

Material: Nickel-based alloy Inconel 718
 Operation: Rough milling with tool \varnothing 32 mm
 $a_p = 30$ mm, $a_e = 8$ mm
 Problem: Short tool life of milling cutters with 3 TiN coated carbide inserts
 Solution: Solid end mill ASP 2052 + TiCN with 6 teeth
 Cutting data: Carbide + TiN:
 $v_c = 20$ m/min, $f_z = 0.08$ mm
 ASP 2052 + TiCN:
 $v_c = 5$ m/min, $f_z = 0.16$ mm
 Benefit: Longer tool life: 2.1 m for ASP 2052 instead of 0.45 m for carbide. Same metal removal rate as carbide

DRILLS



The most significant feature for ASP drills is their astonishing combination of strength and hardness. Spectacular results can be achieved in combining high alloy ASP grades, such as ASP 2060, and modern coatings.

Productive drilling: With ASP, the drill feed rate can be increased far above normal values. ASP drills can often match the productivity of carbide drills.

Successful in difficult drilling operations: ASP drills are most suitable for drilling difficult materials, such as high wear-resistant steels, nickel and titanium alloys and stainless steels. ASP drills are also recommended for such situations as stacked plates, inclined planes and crossing holes.

Safe drilling: Thanks to their high strength, ASP drills break less often than carbide drills. This is particularly advantageous in unstable conditions and for long production series.

Cost efficiency: Based on their reliability, longer life and productivity advantages, ASP drills are highly cost efficient.

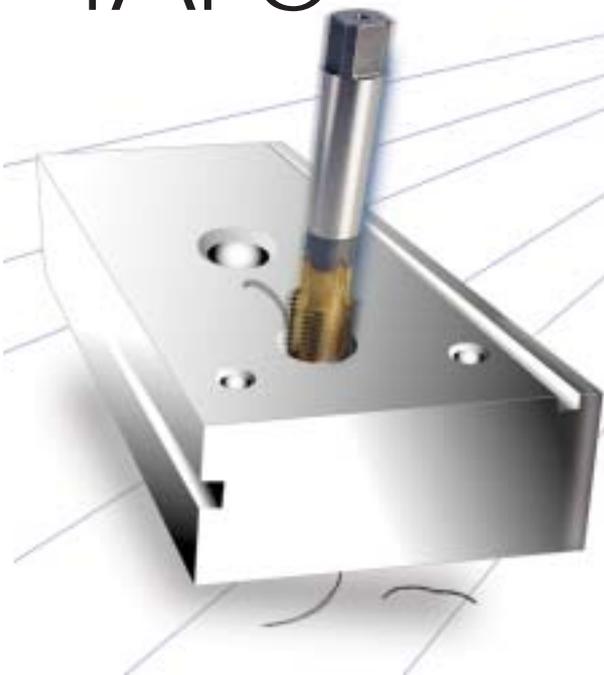
DRILLING DIESEL ENGINE BLOCK WITH ASP 2030

Material: Cast iron G3500, 240 HB
Operation: Drilling bottom holes Ø 6.8 mm, depth 25 mm
Solution: Oil-hole drills in ASP 2030 with TiAlN coating
Benefit: Same productivity as carbide drills but longer tool life and very consistent results

DRILLING OF WEAR RESISTANT STEEL WITH ASP 2060

Application: Excavator and mining equipment
Material: Wear resistant steel Hardox 600, 600 HB
Operation: Drilling of through holes Ø 18 mm, depth 25 mm with 5% emulsion
Problem: Carbide drills could not be used. Tool life of conventional HSS drills was not long enough on pillar-drilling machines
Solution: Drill ASP 2060 + TiAlN with a special geometry
Benefit: Longer tool life, 30 holes, with higher cutting data:
 $v_c = 15 \text{ m/min}$, $f = 0.14 \text{ mm/rev}$.

TAPS



ASP grades are recommended for precision tapping and tapping of difficult-to-machine materials.

Precision taps: As a result of precision grinding, the edges of ASP taps offer better sharpness with high edge resistance, compared with conventional taps.

Optimum safety: Due to the reduced risk of tool breakage, ASP taps are a particularly attractive alternative for tapping high-value parts.

High hardness materials, above 300 HB, are usually difficult to machine with conventional HSS tools. ASP taps are very efficient to machine materials such as titanium and nickel alloys in the aerospace industry. And wear resistant steels, up to 500 HB can also be machined successfully with ASP taps.

TAPPING OF WEAR-RESISTANT STEEL WITH ASP 2060

Material: Hardox 500, hardness 500 HB
Operation: Tapping of through holes Ø 18 mm, depth 25 mm with a M20 tap
Solution: Tap ASP 2060 + multilayer TiAlN coating
Performance: A number of tests yielded the following result:
 $v_c = 3 \text{ m/min}$, (rpm = 45) 30 holes

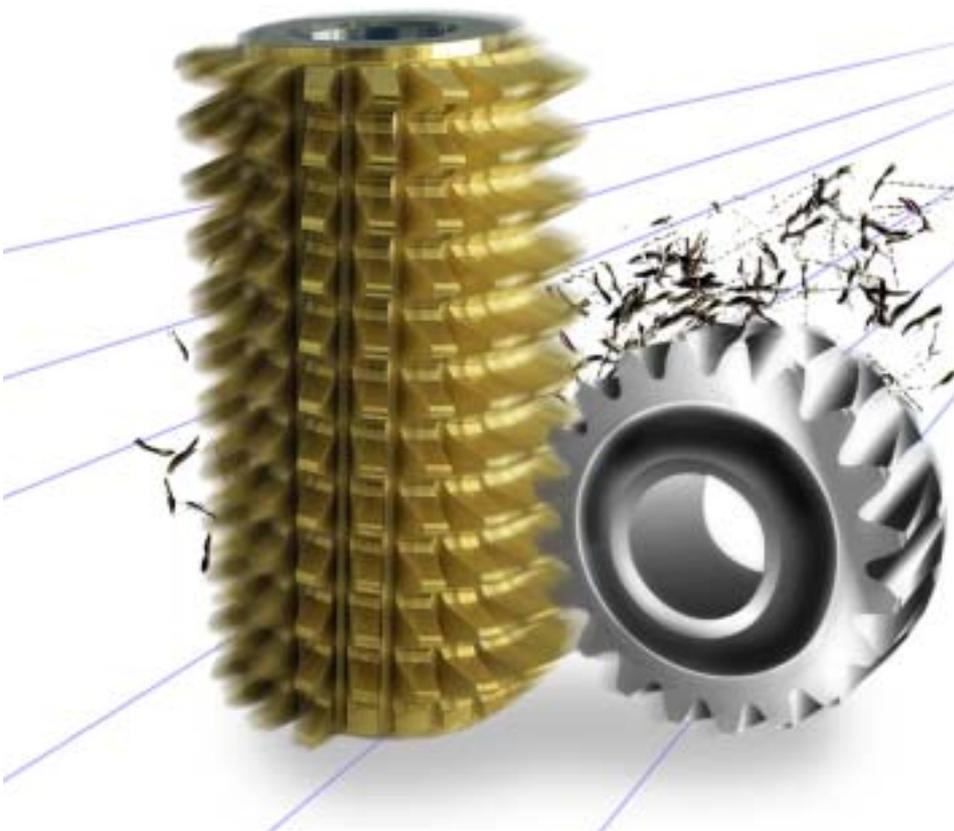
GEAR CUTTING TOOLS

ASP was introduced several years ago in gear cutting tools combined with modern coating. This resulted in a significant productivity improvement in gear cutting operations. Leading producers of hobs, shaper and shaving cutters choose ASP to gain the best conceivable performance.

High productivity hobbing: Cutting speed can be increased significantly with ASP grades.

Dry cutting: ASP opens new possibilities in dry machining thanks to the steel's unique combination of high (hot) hardness and strength. For these demanding applications, Erasteel has developed ASP 2080, a high-alloy grade.

More economical tools: Thanks to the high strength of ASP grades, there is less risk of tool breakage, avoiding premature tool scrapping.



HIGH-SPEED DRY HOBGING WITH ASP 2052

Workpiece: Automotive gear
Material: Steel 27MnCr5 (HB 185)
Operation: Hobbing – tool \varnothing 107 mm, length 210 mm
Former solution: M 35 TiN coated segmented hob
 $v_c = 78$ m/min, $f = 3.2$ mm/rev.
Lubricant: oil
New solution: ASP 2052 + TiAlN + MoS₂ coated integral hob
 $v_c = 160$ m/min, $f = 3$ mm/rev.
No lubricant
Benefit: Productivity nearly doubled, no lubricant, same number of parts produced

SHAPING GEARS WITH ASP 2030

Workpiece: Transmission gears (module 4.5)
Material: Carbon steel (0.4%)
Operation: Shaping transmission gears
Former solution: M42 shaper cutter
HRC 67
New solution: ASP 2030 shaper cutter
HRC 67
Benefit: Number of components produced per tool 2.5 times higher, increased from 400 to 1000

OTHER TOOLS

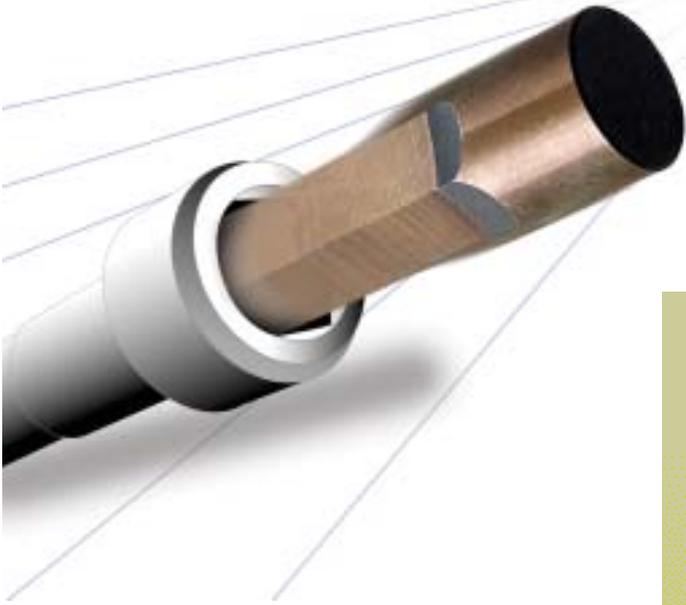
ASP enhances the quality of all tools and minimizes the risk for cutting edge breakage.

In broaching, ASP is now often used as a standard grade in the automotive and aerospace industries. ASP broaches offer higher wear resistance for less chipping and longer tool life. ASP broaches remain sharper longer and can be reground more times than conventional broaches. Sharper edges result in lower cutting forces and better surfaces.

In high performance reaming, ASP combined with coatings can be a reliable and high-quality alternative to carbide reamers.

Knives operating in difficult conditions benefit from the properties of ASP steels. ASP 2053 is a well-known powder grade for excellent edge sharpness and higher wear resistance for application in the paper and wood industry.

Cold forming tools, such as dies and punches, is another area in which ASP steel offers substantial advantages, such as high wear resistance for superior tool life, improved polishability and high surface finish without defects.



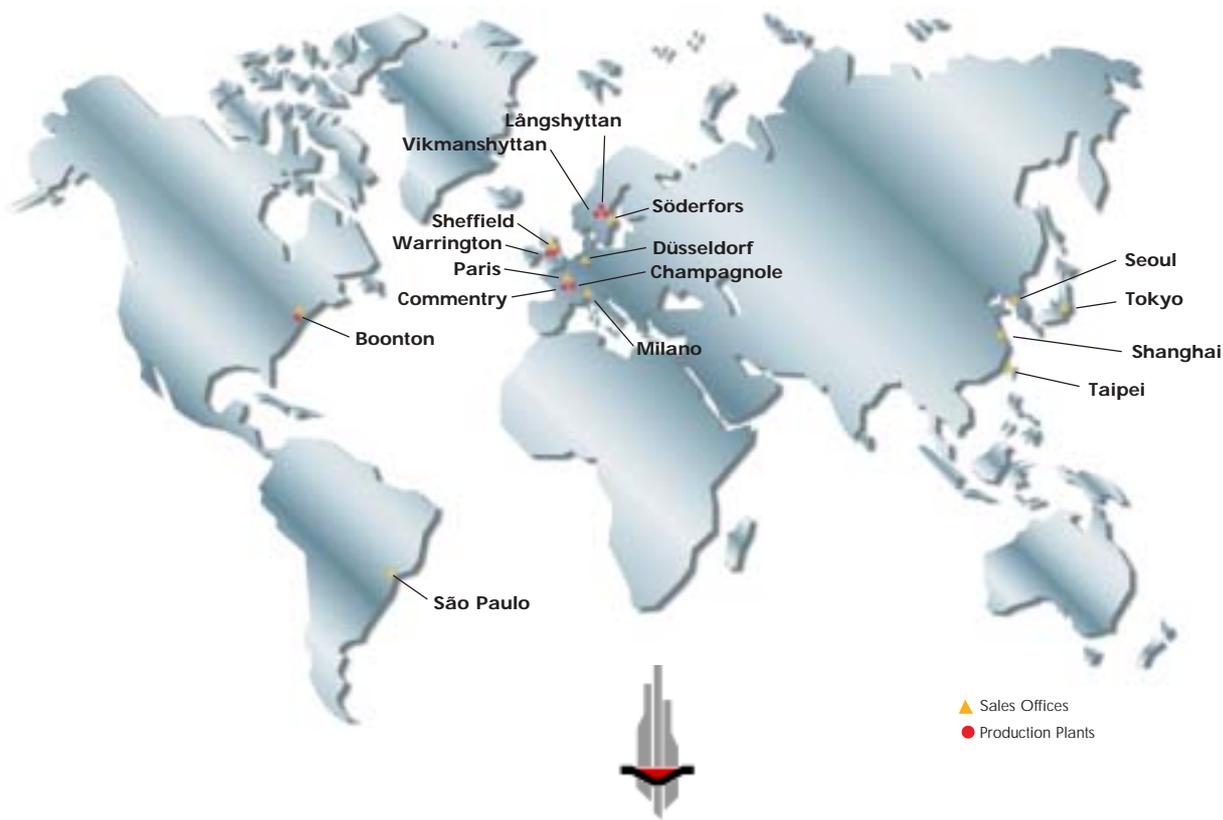
BROACHING AUTOMOTIVE GEARS WITH ASP 2023

Workpiece: Transmission gear \varnothing 150 mm
Material: Case hardening steel
Operation: Broaching
Former solution: M 2
HRC : 2400 gears per regrind
New solution: ASP 2023
HRC : 4250 gears per regrind
Benefit: Number of gears produced per tool 3.5 times higher – increased from 24000 to 89000.
More regrinds due to less wear, 0.1 mm compared to 0.23 mm per regrind and less micro-chipping

REAMING WITH ASP 2060

Workpiece: Automotive connecting rod
Material: Manganese steel
Operation: Reaming of a hole \varnothing 9.27 mm
Problem: Low tool life of the TiN coated carbide reamer due to thermal cracking of the cutting edge, no regrinding possible
Solution: Reamer ASP 2060 + TiN
Cutting data: $v_c = 21$ m/min, $v_f = 245$ mm/min
 $f_z = 0.068$ mm
Benefit: Tool life 3 times longer:
3000 holes per regrind instead of 1000 holes for the carbide reamer, about 10 regrinds





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