

ERASTEEL

ASP®
TOOL STEELS
Make your life easier!



ERASTEEL, THE MARKET LEADER IN POWDER METALLURGY HIGH-SPEED STEELS

Erasteel is a major player of Powder Metallurgy High-Speed Steels and High-Speed Steels market with high-end conventional steels.

With its ASP® range, Erasteel is the world leading producer of Powder Metallurgy High-Speed Steels for high performance tooling and components with production facilities in France, Sweden and China in addition to sales companies throughout the world.

Erasteel also produces HIP powder, such as stainless powder, tool steel powder and High-Speed Steel powder under the brandname Pearl®.

Erasteel is fully involved in reducing its overall environmental impact. Indeed, its recycling rate to produce High-Speed Steel is already 90% of input material. These good results are nevertheless still challenged. Erasteel has the ambition to become the only producer in the world of 100% recycled High-Speed Steel by developing specific processes in order to recycle new sources of end of life material. For the most common grades, the decrease of CO₂ emissions thanks to this recycling rate is 85% compared to a 100% production from metallic ores. This calculation includes the energy to melt and refine the scraps.

All plants are **ISO 9001 and ISO 14001 certified** and all emissions in air or water are carefully treated, cleaned and controlled.



Söderfors Sweden - Durin atomization tower



Choosing an Erasteel solution is to engage:

- with the **most carbon-free High-Speed Steel producer** on the market
- towards a **more virtuous production and metallurgical solutions** that combine economic and environmental issues

INNOVATION & EXPERTISE

Erasteel has achieved a **high standard of quality and experience in the processing of Powder Metallurgy Steels and High-Speed Steels.** A policy of continuous investments has enabled Erasteel to use the latest technologies to improve both quality and productivity and develop new products in line with customers' needs.

Customer-oriented Research & Development

- A solution-oriented spirit to **meet and support customers' needs and developments**
- A **long experience of technical service** and examinations of Powder Metallurgy components and tools in ASP®
- **Customer partnerships** in product development analysis and improvement of tools and parts

50 years of expertise in Powder Metallurgy

- A **unique knowledge** of gas-atomized metal powders
- A focus on powder **cleanliness, processing, consolidation and properties**
- A **dedicated research laboratory** in Söderfors, Sweden, with highly skilled teams, cooperating with a network of universities, laboratories and industry organizations



ERASTEEL, PARTNER OF TODAY AND TOMORROW'S INDUSTRY

TRANSPORTATION

ELECTRICAL CARS

With its ASP® Erasteel offers a wide range of Powder Metallurgy grades, suitable for **many tools dedicated to electrical cars that require high performance applications.**

- Materials and parts are becoming increasingly difficult to shape.
- Improving productivity and reducing costs are leading to increased production rates and reduced maintenance.
- Complex parts require complicated tools with small radius, sharp corners, thin walls and severe change of section where toughness and impact strength are therefore one of the most important properties to prevent any brittle behaviour.

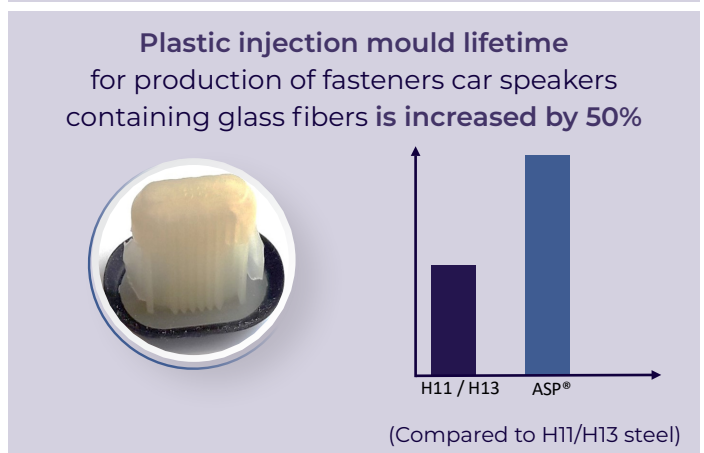
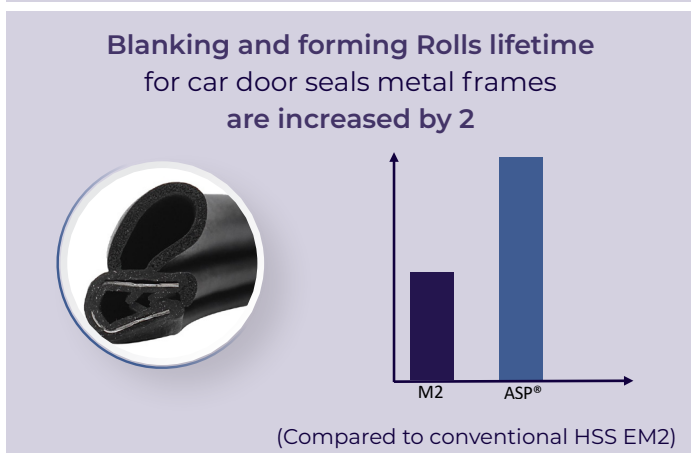
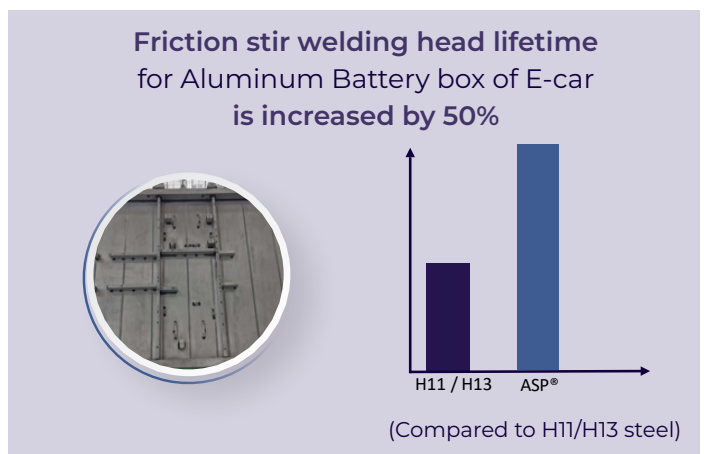
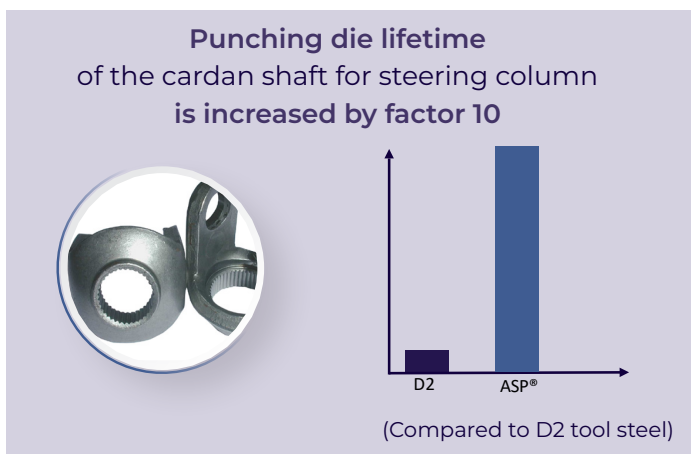


This increase in **tool strength and longer life** require the use of steels with improved properties, in particular tool steels obtained by Powder Metallurgy.

Thanks to their production process, Powder Metallurgy tool steels have a very even distribution of finer and harder primary carbides, which result in a good combination of **toughness, strength and hardness** compared to conventional tool steels.

Erasteel is your solution provider, helping you to choose the right ASP® grade.

ASP® GRADES: THE BEST CHOICE



ENERGY & INDUSTRIAL

The Erasteel ASP® Powder Metallurgy grades are suitable for **many tools dedicated to the manufacturing parts of the power generation sector**. Especially, windmills mechanical parts, such as gears, require high geometrical precision. Blanking and fine blanking **cold work tools made of ASP® show better performance and longer lifetime** in production phase of stamped or mechanical parts compared to standard tool steel grades. ASP® grades are used as well in hobs to manufacture these high precision gears to transfer the mechanical energy to the generator. These grades are also a premium choice to produce the bearings with premium requirements in terms of reliability and lifetime.



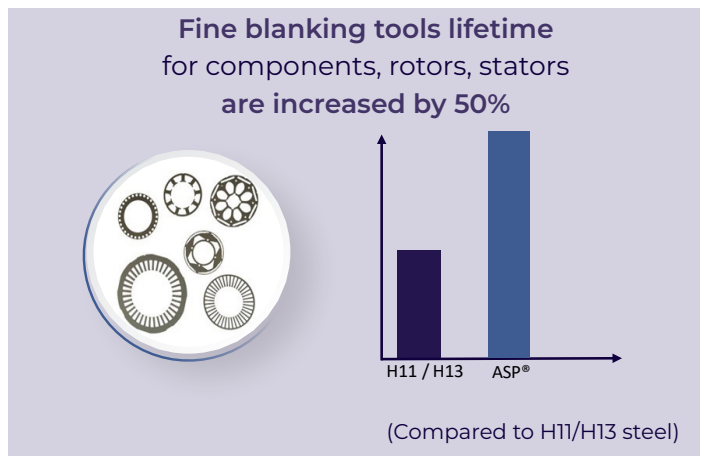
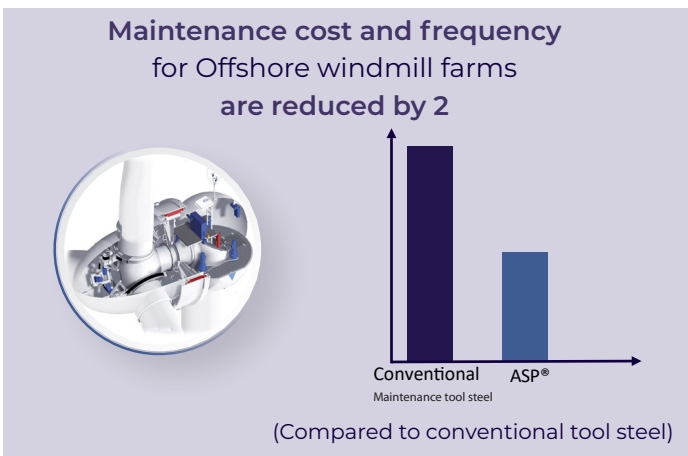
This statement applies for any power generator using mechanical force such as small and middle scale hydropower plants.

The advantages that can have a decisive positive impact on offshore windmill farms are:

- Reduced friction
- Lower vibration and noise
- Higher energy production
- Less maintenance

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ASP® GRADES: THE BEST CHOICE



HEALTH & CARE - FOOD

Erasteel is involved in the **food processing and packaging industry as well as in the health and care segment**. Through to its ASP®, Erasteel is proposing a wide range of possibilities to improve the lifetime of the tools. Indeed the Powder Metallurgy developed by Erasteel contribute to reduce the tooling maintenance and production costs by increasing the performances.



Our Powder Metallurgy steels enhance:

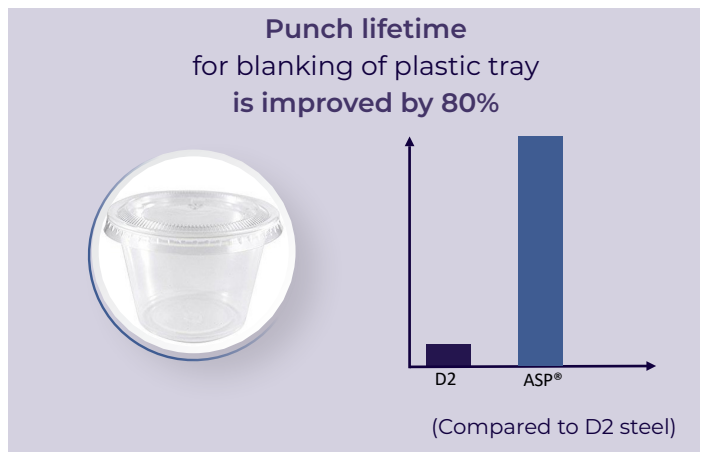
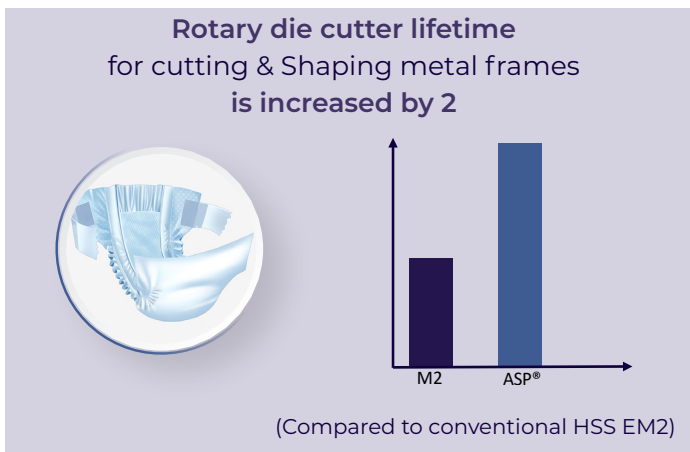
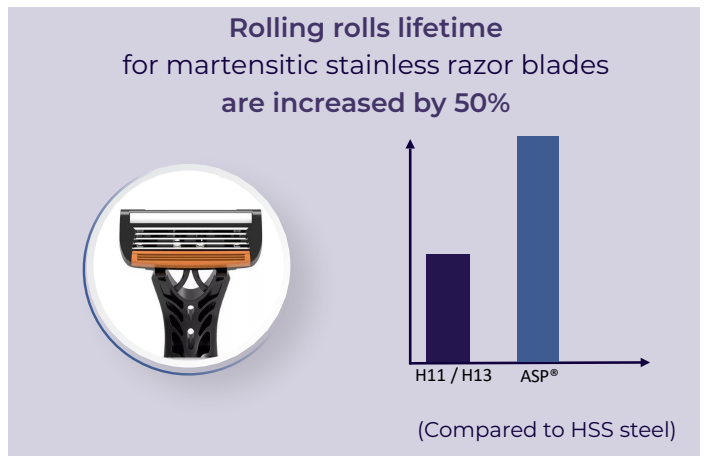
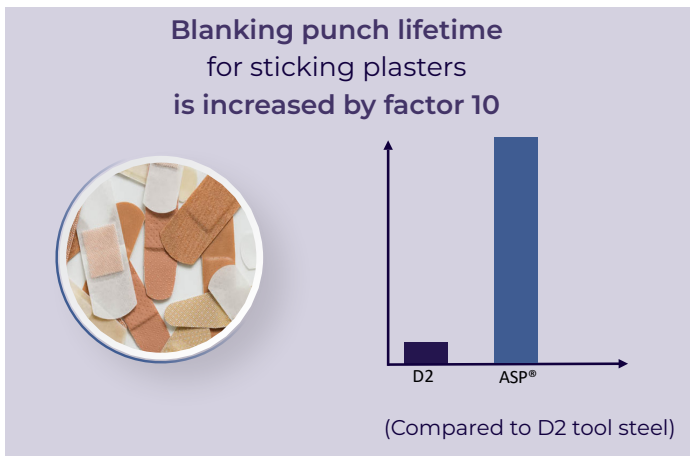
- Abrasive and adhesive wear resistance
- Corrosion resistance
- Toughness
- Fatigue resistance

ASP® grades are successfully used to produce:

- Plastic packaging single-dose capsule for oil, vinegar, water, butter etc...
- Semi-cut cardboard box
- Baby diapers and sanitary articles
- Band- Aids

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ASP® GRADES: THE BEST CHOICE



CONSUMERS

Performances drive customer preferences.

For instance consumers depend on their smartphones to fulfill all their daily needs and activities, thus the cellphones became more sophisticated and integrated.

The demand of optimization for the consumers electronics is strong. This leads to higher quality level for precision components and tooling.

Better precision means higher expectations from the tools.

ASP® grades developed by Erasteel bring extended lifetime for the tools by:

- Minimizing the abrasive wear
- Improving the toughness

ASP® grades are successfully used to produce:

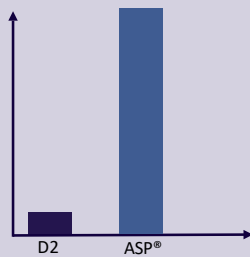
- Stainless frame and parts of smartphones
- Optical lenses for camera and microphone components
- Micro gears by MIM process



Erasteel is your solution provider, helping you to choose the right ASP® grade.

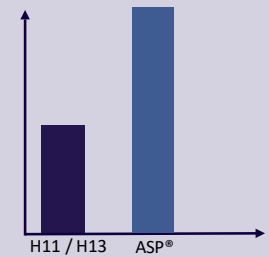
ASP® GRADES: THE BEST CHOICE

Blanking punch lifetime of the stainless body is increased by 10



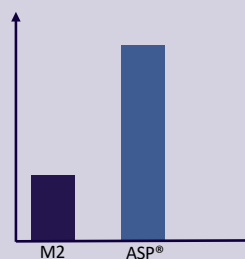
(Compared to D2 tool steel)

Plastic moulding lifetime for optical lenses is increased by factor 2



(Compared to H11/H13 steel)

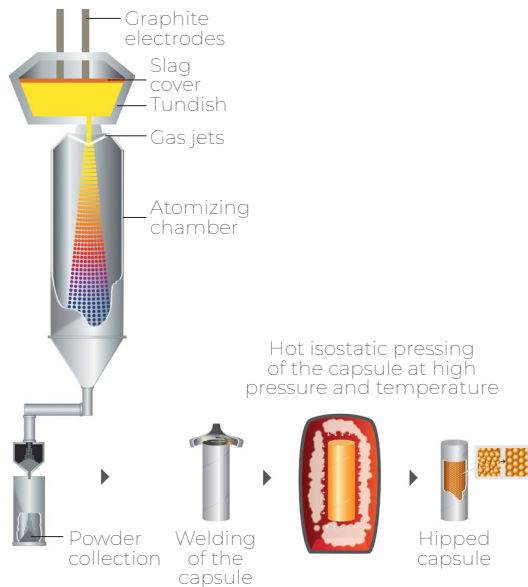
Metallic Injection Moulding productivity for micro gears is increased by 300%



(Compared to conventional HSS EM2)

ASP® PROCESS

POWDER METALLURGY



Erasteel is the **world leading producer of gas-atomized Powder Metallurgy steels.**



With more than **50 years of experience** in Powder Metallurgy, Erasteel produces Powder Metallurgy High-Speed Steels with a high cleanliness level known under the **trademark ASP®.**

The molten steel is refined in a heated tundish to remove inclusions and homogenize the composition.

During gas atomization the molten steel is disintegrated by powerful jets of nitrogen gas into small droplets, which solidify at a very high speed. The powder is collected in a steel capsule which is then evacuated and welded. The capsule with powder is Hot Isostatically Pressed (HIP) to a 100% dense material.

Bars, wire rods, strips and sheets are obtained from forging, hot and cold rolling and wire drawing of the HIP capsules.

Thanks to these properties, Erasteel's ASP® grades are widely used in many high performance applications such as tooling for metal, plastics, wood and paper processing as well as mechanical components.

ERASTEEL'S OFFER OF ASP®

GRADES	Analysis %						CHARACTERISTICS
	C	Cr	Mo	W	Co	V	
ASP®2004*	1.4	4.2	5.0	5.8	-	4.1	Good wear resistance and hardness
ASP®2005	1.5	4.0	2.5	2.5	-	4.0	Good wear resistance and toughness
ASP®2009	1.8	5.3	1.3	-	-	9.1	Wear resistance and toughness for plastics extrusion
ASP®2011	2.45	5.3	1.3	-	-	9.5	V-alloyed with high abrasion resistance
ASP®2012	0.60	4.0	2.0	2.1	-	1.5	Very high toughness for hot and cold work
ASP®2023	1.28	4.1	5.0	6.4	-	3.1	Non-Co-grade with overall good properties
ASP®2053	2.48	4.2	3.1	4.2	-	8.0	V-alloyed grade for abrasive wear resistance
ASP®2015	1.55	4.0	-	12.0	5.0	5.0	High W-alloyed grade for high performance tools
ASP®2030*	1.28	4.2	5.0	6.4	8.5	3.1	Co-grade with good combination of hardness and toughness
ASP®2042	1.08	3.8	9.4	1.5	8.0	1.2	For flat red rolling dies application
ASP®2048*	1.50	3.8	5.3	9.8	8.5	3.1	High alloyed for high performance tools
ASP®2052	1.67	4.8	2.0	10.5	8.0	4.9	High Co-grade for high performance blanking and good wear resistance
ASP®2055	1.69	4.0	4.6	6.3	9.0	3.2	2.1% Nb. High alloyed Co-grade with good grindability
ASP®2060	2.30	4.2	7.0	6.5	10.5	6.5	For both hot hardness and wear resistance
ASP®APZ10	1.25	19.0	2.1	-	-	0.8	Good corrosion and wear resistance
ASP®420H	2.30	14.0	1.0	-	-	9.0	Good corrosion and wear resistance

* also available with sulfur

A hand is shown holding a glowing, fiery Earth. Surrounding the Earth are several circular icons representing different energy and sustainability concepts: a sun, a flame, a recycling symbol, a water drop with a leaf, a house with a wavy line below it, solar panels, wind turbines, and an electric car charging station.

ERASTEEL

Solution provider

www.erasteel.com

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