ERASTEEL



ASP® TOOL STEELS

Make your life easier!

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

With its ASP® range, Erasteel is the global leader in Powder Metallurgy High-Speed Steels for high-performance tooling and components, serving customers worldwide through production facilities in France, Sweden and China, and a global network of sales offices.

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



CHOOSING AN ERASTEEL SOLUTION MEANS CHOOSING:

- a **more virtuous production and metallurgical solutions** that combine technical, economic and environmental challenges

Erasteel is fully involved in reducing its overall environmental impact. Indeed, its High-Speed Steels are **already made from more than 91% recycled materials**.

For the most common grades, the decrease of CO_2 emissions thanks to this recycling rate is significantly lower than 100% production from metallic ones.

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

INNOVATION & EXPERTISE

Erasteel has achieved a **high standard of quality and experience in the processing of Powder Metallurgy 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 competitiveness clusters

ASP® and PEARL® are registered trademarks of Erasteel.



ERASTEEL, PARTNER OF TODAY'S 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 increase production rates and reduce 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** requires 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

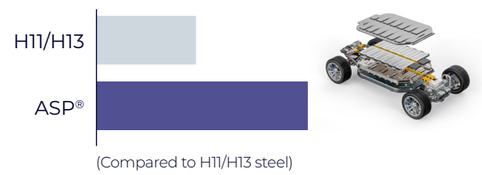
ASP® grades: the best choice

PUNCHING DIE LIFETIME
of the cardan shaft for steering column
is increased by factor 10



(Compared to D2 tool steel)

FRICTION STIR WELDING HEAD LIFETIME
for aluminum battery box of E-car
is increased by 50%



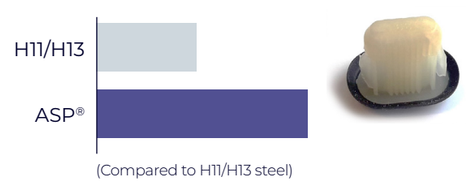
(Compared to H11/H13 steel)

BLANKING AND FORMING ROLLS LIFETIME
or car door seals metal frames
is increased by 2



(Compared to conventional HSS M2)

PLASTIC INJECTION MOULD LIFETIME
for production of fasteners car speakers containing glass fibers **is increased by 50%**



(Compared to H11/H13 steel)

ASP® is a registered trademark of Erasteel.

ENERGY & INDUSTRIAL

The **Erasteel ASP® Powder Metallurgy grades** are suitable for **many tools dedicated to the manufacturing of parts for the power generation sector.** Especially, windmill 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

ERASTEEL IS YOUR SOLUTION PROVIDER, HELPING YOU TO CHOOSE THE RIGHT ASP® GRADE



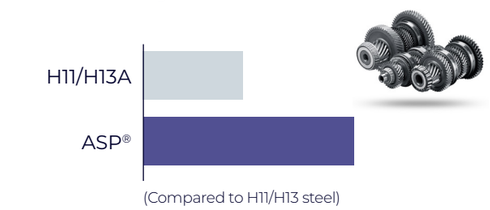
ASP® grades: the best choice

MAINTENANCE COST AND FREQUENCY
for offshore windmill farms
are reduced by 2



(Compared to conventional tool steel)

FINE BLANKING TOOLS LIFETIME
for components, rotors, stators
is increased by 50%



(Compared to H11/H13 steel)

ASP® is a registred trademark of Erasteel.



HEALTH & CARE - FOOD

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

Our Powder Metallurgy High-Speed 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
- semi-cut cardboard box
- baby diapers and sanitary articles
- plasters

ERASTEEL IS YOUR SOLUTION PROVIDER, HELPING YOU TO CHOOSE THE RIGHT ASP® GRADE

ASP® grades: the best choice

BLANKING PUNCH LIFETIME
for sticking plasters
is increased by factor 10



(Compared to D2 tool steel)

ROLLING ROLLS LIFETIME
for martensitic stainless razor blades
is increased by 50%



(Compared to H11/H13 steel)

ROTARY DIE CUTTER LIFETIME
for cutting & shaping metal frames
is increased by 2



(Compared to conventional HSS M2)

PUNCH LIFETIME
for blanking of plastic tray
is improved by 80%



(Compared to D2 tool steel)

ASP® is a registered trademark of Erasteel.

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 frames and parts of smartphones
- optical lengths for camera and microphone components
- micro gears by MIM process

ERASTEEL IS YOUR SOLUTION PROVIDER, HELPING YOU TO CHOOSE THE RIGHT ASP® GRADE



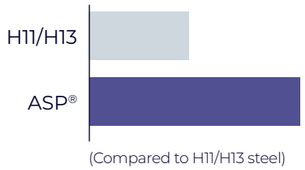
ASP® grades: the best choice

BLANKING PUNCH LIFETIME
of the stainless body
is increased by 10



(Compared to D2 tool steel)

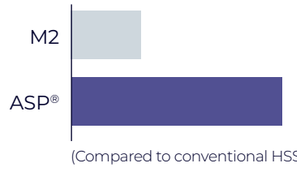
PLASTIC MOULDING LIFETIME
for optical lenses
is increased by factor 2



(Compared to H11/H13 steel)



METALLIC INJECTION MOULDING PRODUCTIVITY
for micro gears **is increased by 300%**



(Compared to conventional HSS M2)



ASP® is a registered trademark of Erasteel.

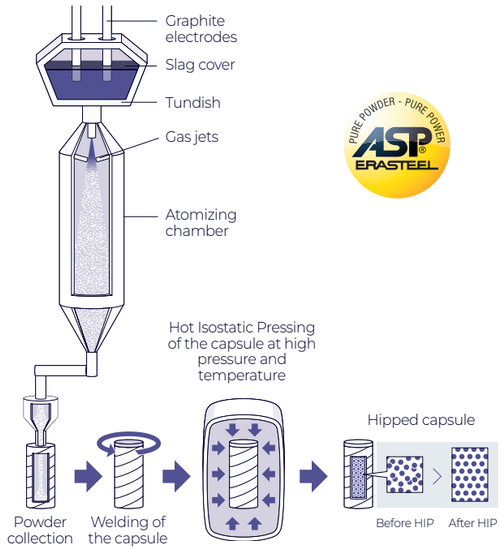
ASP® PROCESS

Erasteel is the **world's leading producer of gas-atomized Powder Metallurgy High-Speed Steels.** With over **50 years of Powder Metallurgy expertise**, Erasteel develops and manufactures its **ASP® grades,** renowned for their high cleanliness and performance.

The molten steel is refined in a heated tundish to remove inclusions and ensure a homogeneous composition. During gas atomization, powerful nitrogen jets disintegrate the molten steel into small droplets that solidify at a very high speed. The powder is collected in a steel capsule, which is evacuated, welded and Hot Isostatically Pressed (HIP) into a 100% dense material.

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

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



ERASTEEL'S ASP® OFFER

GRADES	COMPOSITION %						CHARACTERISTICS AND APPLICATIONS
ERASTEEL	C	Cr	Mo	W	Co	V	
ASP® 2003	0.80	7.5	1.3	-	-	2.6	High toughness and wear resistance for cold work
ASP® 2004	1.43	4.2	5.0	5.8	-	4.1	Good wear resistance and hardness
ASP® 2005	1.50	4.0	2.5	2.5	-	4.0	Good wear resistance and toughness
ASP® 2008	1.08	4.0	2.5	2.5	-	1.8	1.8% Nb. Very good compromise between impact resistance, compressive strength and adhesive/abrasive wear resistance
ASP® 2009	1.90	5.3	1.3	-	-	9.1	Wear resistance and toughness for plastics extrusion
ASP® 2011	2.48	5.3	1.2	-	-	9.5	V-alloyed with high abrasive wear 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	4.0	5.0	6.4	-	3.1	Non Co-grade for cold work and cutting tools
ASP® 2053	2.48	4.2	3.1	4.2	-	8.0	V-alloyed grade with excellent wear resistance
ASP® 2062	1.30	3.8	10.5	6.3	-	2.0	High attainable hardness and hot hardness
ASP® 2015	1.62	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 for high performance tools
ASP® 2042	1.08	3.8	9.4	1.6	8.0	1.2	Co-grade for bi-metal band saws
ASP® 2048	1.50	3.8	5.3	9.8	8.5	3.1	High alloyed for high performance cutting tools
ASP® 2051	1.27	4.0	3.6	9.5	10.0	3.2	For bi-metal band saws, with excellent wear resistance and toughness
ASP® 2052	1.67	4.8	2.0	10.5	8.0	4.9	High-W- and Co-grade for high performance tools
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, very high hot hardness and wear resistance
ASP® 2078**	2.30	4.2	7.0	6.5	10.5	6.5	High performance grade with improved machinability
ASP® 2080	2.45	4.0	5.0	11.0	16.0	6.3	High-alloyed grade with high wear resistance, hardness, and toughness
ASP® 90	1.95	20.0	1.0	0.6	-	4.0	Good combination of corrosion and wear resistance
ASP® APZ10	1.25	19.0	2.1	-	-	0.8	Very good corrosion resistance
ASP® 420V	2.30	14.5	1.0	-	-	8.7	Good corrosion and high wear resistance

ASP® is a registered trademark of Erasteel.

** ASP® 2078 with 0.23% S



ERASTEEL.COM

ASP® Tools Steels_EN_2026 - This document is for information only and does not create any binding contractual obligations