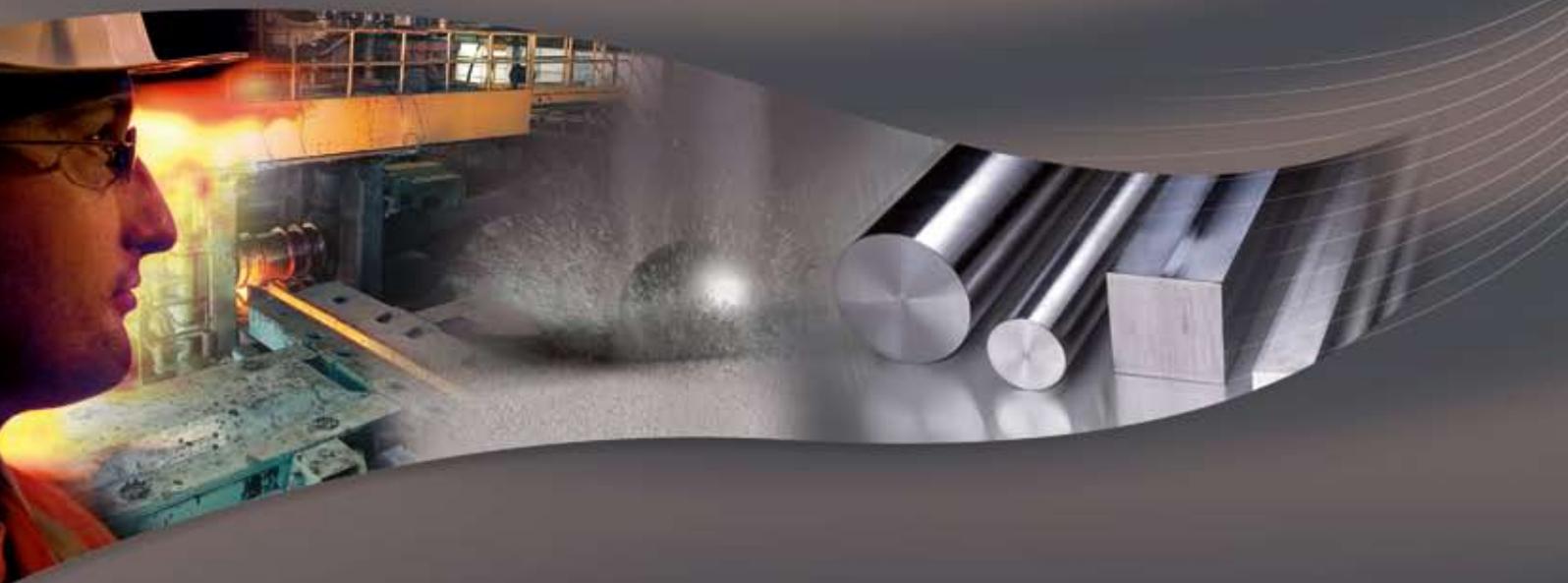




## Special Steels and Alloys for Land & Sea Transportation





Our pledge:

# Your satisfaction

When new metallurgical challenges must be met,  
we stand by you!

Through its 2 companies - Aubert & Duval and Erasteel – Eramet Alloys offers and develops a wide range of metallurgical solutions allowing to meet the ever increasing demands of environmental performance, reliability and cost, for the transportation industry.



## A long history of proven results

Over almost a century, Eramet Alloys has been partnering with main global players to develop value creating solutions for highly demanding applications in Land and Sea Transportation Markets.

Eramet Alloys is willing to share its expertise in all fields of metallurgy such as alloy design, processing (specialty melting, powder metallurgy) and surface treatments.

## Qualified Products and Process

Eramet Alloys follows the most stringent requirements in terms of grade composition, material integrity, dimensional tolerances and quality control.

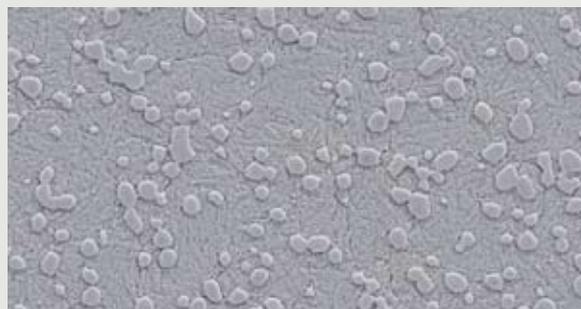
Main Eramet Alloys sites are ISO TS 16949, ISO 9001 and ISO 14001 certified.

## Development

Eramet Alloys has the capability to design, melt, manufacture and market metallurgical solutions based on a wide product portfolio of specialty steels and alloys, R&D equalling 2% of turnover spent every year.

Eramet Alloys continuously improves its inspection means and methods, and recently invested in modern production facilities such as an additional gas atomization unit in Sweden, a state of the art drawing shop in China and a service center in the USA, ensuring competitiveness in terms of performance, quality and cost.

Eramet Alloys can customize solutions based on hipped-powder technology: near-net shape, mono or bimetal components. Metal powder can also be supplied loose for the coating of corrosion-exposed elements, such as valve seats.



*Very small and homogeneous carbides are the microstructural advantage of ASP steels.*

# A wide range of innovative solutions for Land & Sea Transportation

## Engine components

Eramet Alloys is a key and innovative supplier for diesel injection systems, from small light duty to the largest heavy-duty off-road engines, for injector parts such as **bodies, pistons, nozzles, valves or needles, and pump parts such as bodies, cam-rings, rollers or plungers.**

Through advanced martensitic stainless steels such as X15TN displaying an outstanding combination of hardness, wear and corrosion resistance, Eramet Alloys is at the forefront of green mobility with gasoline injectors running on flex fuels or advanced emission control systems.

Eramet Alloys offers cost efficient alternatives for **intake and exhaust valves.**

Eramet Alloys is a leading supplier to the motorsport industry and especially Formula1, supplying innovative and reliable solutions for highly demanding parts such as **crankshafts, camshafts or transmissions.**



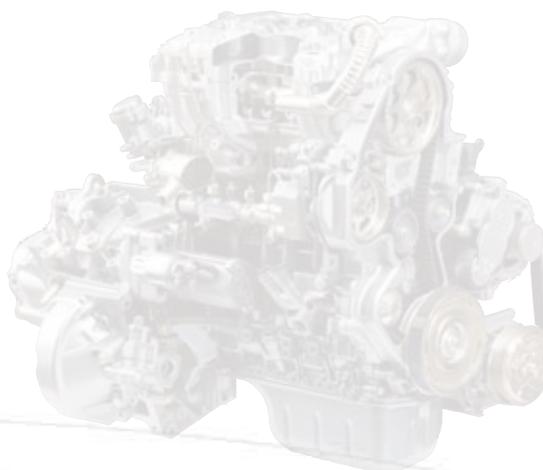
Injector for marine injection systems



Injector for passenger car



Pump for marine injection systems



Crankshaft



Tool Steels for Pressure die Casting



Valves

# Solutions

## Other applications

Eramet Alloys supplies specific products for niche markets such as cold rolled strips for high pressure hydraulic vane pumps used for steering or variable transmission, wire for high temperature fasteners and bars for various other wear parts.

Eramet Alloys also widely supplies the automotive industry with tool steels for plastics molds and die-casting dies as well as hobs, taps and broaches for machining gears and various components.

Eramet Alloys is a partner for the development of emerging powertrain technologies, helping designers find material solutions to meet their future requirements.



**Cross-pieces  
for railway application**



**Vanes for high pressure pumps**

## Shapes and Dimensions

Products	Diameter or Thickness	Width/ Length
• Round bars, Wire	Ø 0.8 → 900mm	
• Flat & Square Bars	≤ 170mm	W. ≤ 400mm
• Flat & Square Bars	170 → 700mm	W. 400 → 1050mm
• Bars or Blanks (LINEA™), pre hardened M2 or ASP®	Ø 0.7 → 3.4mm	L. ≤ 2m
• Cold rolled strips	0.6 → 3.8mm	W. 6.35 → 85mm
• Sheets, Plates	0.6 → 150mm	2000 x 1000mm (→ 4000)
• Closed-die forging parts		
• Near-Net Shape blanks		
• Castings		
• Gas atomized Powders		



**Gear cutting tools  
for the automotive industry**

## Some references

Alstom, Bombardier, Bosch, Continental, Delphi, Denso, Eaton, Ferrari, Honda, Ixetic, L'Orange, Magneti Marelli, Man Diesel, McLaren, Mercedes, OMT, PSA, Renault-Nissan, SNCF, TRW, ZF Lenksystem,...



**Plastic mold  
for automotive headlights**

# A Dedicated and Complete Offering

Thanks to an extensive grade range, Eramet Alloys can meet a great variety of needs in the Land & Sea Transportation industry. Metallurgical solutions can be found to provide an optimum combination of characteristics to reliably withstand high temperatures, pressures, abrasive or corrosive environments.

Designations				Melting Route			Main Applications				
AFNOR	WL	AISI - UNS - JIS - OTHERS	AMS	Air melt	Special melt*	Powder Metallurgy	Fuel Injection Systems	Valves	Hydraulic Pumps	Racing	Others
<b>ENGINEERING STEELS</b>											
<b>Nitriding</b>											
GKH	33CrMoV12-9		K24340	6481							
GKP	32CrMoV5		K23280	6496 / 6497							
<b>Carburizing</b>											
MMR1PC	16NiCr5 4										
FADH	14NiCrMo13-4	1.6657									
FDG	20NiCrMo13	1.6660*	K41910	6492 / 6493							
FND	15NiMoSiCr10		K51570	6494 / 6495							
BXO	18NiCrMo5-4										
<b>Through hardening</b>											
BMV4	40CrMoV4	1.7784	T20811								
FDMA	30NiCrMo16										
MARVAL18	X2NiCoMo18-8-5	1.6359	K92890 - MARAGING 250	6512							Gear box
<b>Specialties</b>											
GD223	X60NiMnCr13-5-3										
<b>TOOL STEELS</b>											
SMV4S	X40CrMoV5-1	1.2344	H13 - SKD61								Die Casting
SRV2	X110CrMoW8-2										
RA4 / E M50	80MoCrV42-12	1.3551	M50								Wear parts
E M2	HS 6-5-2	1.3343 / 1.3339	M2								Wear parts
E T1	HS 18-0-1	1.3355	T1 - SKH2								
ABCIII	HS 3-3-2	1.3333									
ASP® 2012	PMHS 2-2-2	1.3397									
ASP® 2017	PMHS 3-3-1-8	1.3288									
ASP® 2005	PMHS 3-3-4	1.3377									
ASP® 2004	PMHS 6-5-4	1.3361									
ASP® 2042	PMHS 2-9-1-8	1.3247									
<b>SUPERALLOYS</b>											
EA1	NiCr20TiAl	2.4952	N07080 - NIMONIC 80 A								
PER625	NiCr22Mo9Nb	2.4856	N06625 - INCO 625	5666							
PER718	NiCr19Fe19Nb5Mo3	2.4668	N07718 - INCO 718								
PER3	NiCr20Co13Mo4Ti3Al	2.4654	N07001 - WASPALOY	5706 - 5708 - 5709							
SY6 - TY6			STELLITE 6 - R30006								
<b>STAINLESS STEELS</b>											
<b>Martensitic Stainless Steels</b>											
X15TN	X40CrMoVN16-2	1.4123*	S42025	5925							
XD16N	X50CrSiMnVN16-1			5926							
CX13VD	X12CrNiMoV12-3	1.4933	S64152	5719							
APZ10	X120CrMoVN19-2										
<b>Austenitic Stainless Steels</b>											
D25T/XN26TW	X6NiCrTiMoVB25-15-2	1.4944	A286 - S66286	5731 - 5732							Fasteners
X21RC	X50CrMnNiNbN21-9	1.4882									
X26RC	X30CrNiMnNbN25-12										
X23N	X33CrNiMnN23-8	1.4866	NITRONIC 20								
<b>ALUMINUM ALLOYS</b>											
6082	ASGM0.7	3.2315	A96082 - He30								Rail

ASP® is a registered trademark of Erasteel.

Special melt: Air melt or VIM + ESR or VAR - VIM: Vacuum Induction Melting - ESR: Electro-Slag Remelting - VAR: Vacuum Arc Remelting

\* Corresponds to an AFNOR numerical designation

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**Design by:** Makheia Affinity, Aubert & Duval 06-2010  
**Photo credit :** Delphi, Joël Damase, L'Orange, Man Diesel, PSA