

Zinc Alloy Precision Casting

Zinc Alloys for Die Cast and Gravity Cast

NEWAY PRECISION WORKS

NewayPrecision

www.newayprecision.com

Technical Data: Die Cast and Gravity Cast Zinc Alloys

Product Description

Zinc alloy plays a pivotal role in precision casting, especially in Consumer Electronics and Telecommunication industries. Its popularity stems from its exceptional properties, notably its corrosion resistance, high thermal conductivity, and precise casting capabilities. In precision casting, where tolerances can be as tight as ± 0.01 mm, zinc alloys shine with their ability to maintain such high precision, ensuring intricate components meet exacting standards.

One noteworthy example of zinc alloy's excellence lies in smartphone manufacturing. The precise dimensions of a phone's housing are crucial in the telecommunication sector. Zinc casting allows for intricate designs while maintaining structural integrity. It contributes to the sleek appearance of the device and enhances its durability, showcasing the remarkable applications of zinc alloy in the world of precision casting. Neway's expertise in utilizing zinc alloy for such applications exemplifies their commitment to delivering high-quality solutions.



Chemical Composition

Alloy Grade	Aluminum	Copper	Magnesium	Iron (max)	Lead (max)	Cadmium (max)	Tin (max)	Zinc
Zamak 3	3.9	0.25	0.02	0.075	0.003	0.002	0.002	95.9
Zamak 5	3.5	0.25	0.035	0.075	0.003	0.002	0.002	95.7
Zamak 2	3.5	0.25	0.02	0.075	0.003	0.002	0.002	95.7
Zamak 7	3.9	0.25	0.035	0.075	0.003	0.002	0.002	95.7
ZA-8	8	2	0.02	0.075	0.003	0.002	0.002	88
ZA-12	11	1	0.02	0.075	0.003	0.002	0.002	86
ZA-35	35	1.5	0.005	0.1	0.005	0.005	0.005	58.5
ACuZinc5	4	4	0.02	0.1	0.003	0.002	0.002	91
EZAC	4	1	0.03	0.1	0.003	0.002	0.002	92
ZA 27	26	2.2	0.02	0.075	0.003	0.002	0.002	68.8

Note

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Physical and Mechanical

Property	Elongation (%)	Tensile Strength	Yield Strength	Impact Strength	Hardness	Density	Melting Point	Thermal Conductivity	Electrical Conductivity
		Mpa	Mpa	J	Brinell	g/cm ³	°C	W/m·K	% IACS
Zamak 2	2	250	180	45	70	6.6	380	109	27-30
Zamak 3	3	260	190	50	80	6.6	380	109	27-30
Zamak 5	7	240	180	40	80	6.6	380	109	27-30
Zamak 7	10	240	170	35	80	6.6	380	109	27-30
ZA-8	3-5	300-320	180-200	60-80	90-100	6.8-7.1	380-386	109	27-30
ZA-12	3-5	320-340	200-220	70-80	90-100	6.8-7.1	380-386	109	27-30
ZA-35	1-2	320-340	180-200	70-80	90-100	6.8-7.1	380-386	109	27-30
ACuZinc5	0.5-2	170-200	140-170	15-20	65-75	6.9-7.3	380-386	121	13-16
EZAC	2-3	290-310	190-210	45-55	80-90	6.6-7.0	380-386	109	27-30
ZA 27 - Zinc Aluminum	44960	310-330	200-220	50-60	90-100	6.5-6.8	380-386	116	17-19
MIM-Fe-50Co As Sintered		750	450	20	45	180	0.3	2.5	7.8

Typical Properties

Zamak 2



Zinc Alloy 2, commonly called Zamak 2 or Kirksite, is recognized for its exceptional strength and hardness within the Zamak alloy family. By ASTM standards, it is classified as ASTM AC43A.

Zamak 2 exhibits superior mechanical properties, making it an ideal choice for precision casting applications. It possesses excellent tensile strength and hardness, ensuring durability and longevity. Its low melting point and exceptional fluidity make it suitable for intricate casting of complex, high-precision parts. Moreover, it showcases excellent surface finish, making it well-suited for applications where aesthetics and precision are paramount. In precision casting, Zamak 2 is extensively utilized for producing a wide range of components, including automotive parts, electronic housings, decorative hardware, and various industrial components. Its high strength and precision casting capabilities enable the creation of intricate, high-precision parts in industries such as Consumer Electronics, Telecommunication, Lighting Solutions, Power Tools, and Locking Systems, where exacting standards are imperative.

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Typical Properties

Zamak 3

Zamak 3, often called Zinc Alloy 3, is recognized as one of North America's most widely used zinc alloys, bearing the ASTM grade AG40A. This versatile alloy is favored for its excellent balance of mechanical properties, combining moderate strength, good ductility, and high impact resistance. With a consistent composition and dependable performance, Zamak 3 is known for its low melting point, facilitating efficient and cost-effective casting. Its corrosion resistance is also valued, making it suitable for various environments.

Zamak 3 is employed across a broad spectrum of precision casting applications. It is commonly utilized in industries such as Consumer Electronics, Telecommunication, and Automotive for manufacturing components like intricate casings, connectors, and housing for electronic devices. Its exceptional properties, including ease of machining, make it ideal for creating high-precision parts where reliability and quality are paramount. Zamak 3's versatility and dependability continue positioning it as a top choice in precision casting.



Zamak 5



Zamak 5 (ASTM AC41A), known as Zinc Alloy 5, is recognized as the predominant zinc alloy in Europe, adhering to the ASTM AC41A. Zamak 5 stands out for its commendable combination of strength and hardness, which makes it a preferred choice for precision casting applications. Its properties make it particularly well-suited for parts requiring higher strength, such as those in the automotive industry. Zamak 5's superior fluidity and low melting point contribute to its precision casting capabilities, allowing for the creation of intricately designed components. Additionally, its corrosion resistance enhances its applicability in diverse environments.

This alloy finds extensive use in precision casting applications, especially in the European market. It is commonly employed in the Automotive industry for producing components that demand enhanced strength and durability. Zamak 5's high-precision capabilities make it suitable for manufacturing parts in sectors like Consumer Electronics, Telecommunication, Lighting Solutions, and Power Tools, where exacting standards are crucial. Its widespread acceptance in Europe underscores its reputation as a top-tier alloy for precision casting.

Zamak 7

Zamak 7, also designated as Zinc Alloy 7 under the ASTM grade AG40B, is a noteworthy modification of Zamak 3. This alloy is recognized for its high purity, ensuring lower magnesium content and stringent impurities specifications.

What sets Zamak 7 apart is its exceptional casting fluidity, improved ductility, and enhanced surface finish, thanks to its lower magnesium content and rigorous impurities control. This alloy's composition and purity make it an excellent choice for precision casting. Zamak 7's attributes make it suitable for precision casting in various industries. It finds application in sectors such as Consumer Electronics and Telecommunication, where high-quality casings, connectors, and intricate parts are essential. Additionally, its superior casting fluidity and purity make it valuable in the Power Tools and Locking Systems industries, contributing to producing high-precision components where strength, ductility, and surface finish are paramount.



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Typical Properties

ZA-8

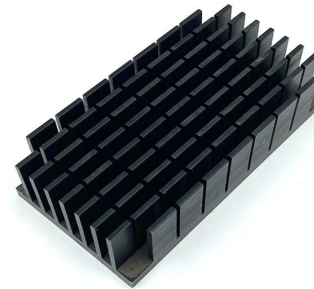


ZA-8, a zinc-aluminum alloy boasting approximately 8.4% aluminum content, stands out as a unique and essential material in precision casting. One of ZA-8's remarkable features is its higher aluminum content, granting it enhanced strength, durability, and wear resistance. Its exceptional fluidity during casting makes it a prime choice for producing intricately designed components, particularly those that demand precision. Notably, ZA-8 is the sole ZA alloy suitable for hot-chamber die casting, an advantage that simplifies the manufacturing process for specific components, as it eliminates the need for additional steps in production.

In precision casting, ZA-8 plays a pivotal role in various industries. Its high strength and wear resistance make it a favored material for creating durable components in the Automotive sector, such as gearbox parts and brackets. Its precision casting capabilities also find utility in the Consumer Electronics and Telecommunication industries, where intricate and high-precision components like connectors and housing are essential. ZA-8's ability to streamline production, thanks to its compatibility with hot-chamber die casting, positions it as a vital choice for applications where precision, strength, and efficiency are paramount.

ZA-12

ZA-12, often recognized in the industry as Zinc Aluminum Alloy 12, is prized for its unique attributes and suitability for demanding applications. One of ZA-12's distinguishing features is its superior resistance to creep, making it ideal for applications requiring prolonged exposure to elevated temperatures. This alloy's remarkable creep resistance ensures stability and reliability even in demanding thermal conditions. Its composition, balanced zinc, aluminum, and other elements, imparts exceptional casting properties, enabling the production of intricate, high-precision parts. ZA-12's suitability for high-temperature environments, combined with its precise casting capabilities, positions it as an excellent choice for applications where both durability and precision are essential. ZA-12 is commonly employed in the Automotive sector for manufacturing components exposed to elevated temperatures, like engine parts and exhaust system components. Additionally, its precision casting capabilities serve well in Consumer Electronics, Telecommunication, and Power Tools industries, where intricate, high-precision components are essential for product performance and longevity. ZA-12's unique



ZA-35



ZA-35, often called Zinc Aluminum Alloy 35, is a versatile alloy known for its strength and impact resistance, making it an excellent choice for various applications.

One of ZA-35's standout features is its combination of good strength and impact resistance. This alloy offers robust mechanical properties, ensuring the durability of cast components. Its casting properties also make it well-suited for precision casting, facilitating the creation of intricate, high-precision parts. ZA-35's reliability in withstanding impact and consistent composition contribute to its wide range of applications. ZA-35 is extensively used in precision casting for applications demanding strength and impact resistance. It finds a notable place in the Automotive industry, where it's employed in manufacturing various components, including brackets and structural parts.

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Typical Properties

ACuZinc5

ACuZinc5, also known as Zinc-Copper Alloy 5, is an innovative alloy developed by General Motors, celebrated for its unique properties and advantages in die casting and gravity casting applications.

This alloy is renowned for its exceptional creep performance, making it a standout choice in applications requiring long-term stability under elevated temperatures. Additionally, ACuZinc5 exhibits remarkable surface hardness, ensuring durability and wear resistance. Its lubricity, or low friction properties, is a distinctive advantage, reducing friction and wear between moving components. These characteristics collectively make ACuZinc5 an ideal choice for precision die casting and gravity casting, especially for parts that must withstand challenging conditions. ACuZinc5's remarkable features find applications in diverse industries. In die casting, it is commonly used in manufacturing parts for automotive and industrial sectors, where high-temperature stability, surface hardness, and lubricity are crucial. Its excellence in gravity casting makes it a preferred choice for producing components for power tools and locking systems, ensuring their long-lasting performance.



EZAC



EZAC, often known as Zinc Alloy EZAC, stands out as a high-quality hot-chamber zinc die-casting alloy, prized for its exceptional properties and diverse applications in die casting and gravity casting.

EZAC is distinguished by its superior creep resistance, making it an excellent choice for applications exposed to high temperatures and prolonged stress. This alloy also boasts high yield strength and hardness, ensuring exceptional durability and wear resistance.

EZAC's remarkable features find utility in a range of industries. Die casting is commonly employed in the automotive sector for producing robust engine components and other parts that require resistance to high temperatures and mechanical stress. Furthermore, its excellence in gravity casting is valuable in the aerospace and power tool industries, where precise, high-strength components are crucial for reliable performance.

ZA 27 - Zinc Aluminum

ZA 27, commonly called Zinc Aluminum Alloy 27, is a distinctive alloy distinguished by its substantial aluminum content, represented by the number 27.

ZA 27 stands out for its remarkable aluminum content, offering exceptional strength and toughness. Its high strength-to-weight ratio makes it a preferred choice for applications with paramount structural integrity and durability. ZA 27's resistance to corrosion, even in demanding environments, enhances its suitability for die casting and gravity casting.

In die casting, ZA 27 is frequently utilized in producing components for the automotive and aerospace industries, where the combination of high strength, lightweight properties, and precision casting is essential. Its adaptability to gravity casting makes it valuable in producing locking systems, power tools, and lighting solutions, where durability and intricate part design are imperative. ZA 27's exceptional aluminum content and precise casting capabilities make it a reliable choice for applications where strength and precision are pivotal.



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