Austenitic Gray Iron in ASTM A436

Austenitic Gray Iron castings in ASMT A48 are used primarily for resistance to heat, corrosion and wear. It's characterized by uniformly distributed graphite flakes, some carbides and the presence of sufficient alloy content to produce an austenitic structure. It's a Ni-Resist cast iron.

Reference Casting Standards:

ASTM A436-84 Standard Specification for Austenitic Gray Iron Castings

Austenitic Gray Iron castings can be produced in Casting Quality Industrial:

- Sand Casting
- Shell Casting
- Lost Form Casting

Austenitic Gray Iron Chemical Requirements in ASTM A436:

Grade		Chemical Composition / Physical Properties % (max, except where range is given)							
Standard	Grade	Carbon	Silicon	Manganese	Nickel	Copper	Chromium	Sulfur	Molybdenum
ASTM A436 Type 1		3.00	1.0-2.8	0.5-1.5	13.5-17.5	5.5-7.5	1.5-2.5	0.12	-
ASTM A436 Type 1b		3.00	1.0-2.8	0.5-1.5	13.5-17.5	5.5-7.5	2.5-3.5	0.12	-
ASTM A436 Type 2		3.00	1.0-2.8	0.5-1.5	18.0-22.0	0.5	1.5-2.5	0.12	-
ASTM A436 Type 2b		3.00	1.0-2.8	0.5-1.5	18.0-22.0	0.5	3.0-6.0	0.12	-
ASTM A436 Type 3		2.60	1.0-2.0	0.5-1.5	28.0-32.0	0.5	2.5-3.5	0.12	-
ASTM A436 Type 4		2.60	5.0-6.0	0.5-1.5	29.0-32.0	0.5	4.5-5.5	0.12	
ASTM A436 Type 5		2.4	1.0-2.0	0.5-1.5	34.0-36.0	0.5	0.1	0.12	
ASTM A436 Type 6		3.0	1.5-2.5	0.5-1.5	18.0-22.0	3.5-5.5	1.0-2.0	0.12	1.0

Austenitic Gray Iron Mechanical Requirements in ASTM A436:

Grade		Mechanical Requirements		
Standard	Grade	Tensile Strength, min, ksi	Tensile Strength, min, (MPa)	Brinell Hardness (3000kg)
ASTM A436 Type 1		25	172	131-183
ASTM A436 Type 1b		30	207	149-212
ASTM A436 Type 2		25	172	118-174
ASTM A436 Type 2b		30	207	171-248
ASTM A436 Type 3		25	172	118-159
ASTM A436 Type 4		25	172	149-212
ASTM A436 Type 5		20	138	99-124
ASTM A436 Type 6		25	172	124-174

Austenitic Gray Iron Heat treatment in ASMT A436:

Bye agreement between the manufacturer and the purchaser, the castings may be stress relieved by heating to and holding in the temperature range from 1150 to 1200°F (620 to 650°C) for not less than 1 nor more than 2 h/in. of thickness in the thickest section. Heating and cooling shall be uniform and shall be not more than 400°F (222°C)/h for castings less than 1 in. in maximum thickness, nor more than 400°F/h divided by the maximum section thickness in inches for thicker castings. During the cooling cycle, castings may be cooled in still air after temperature has dropped to 600°F (315°C).

If the manufacturer can demonstrate that another treatment provides satisfactory stress relief, it may be used by agreement between the manufacturer and the purchaser.

Whenever dimensional changes in high-temperature service are a problem, by agreement between the manufacturer and the purchaser, the castings may be stabilized by heating at 1600°F (870°C) for 1 h/in. of section, for a minimum of 1 h. Otherwise, the austenite that is supersaturated with respect to carbon may reject carbon during service and produce dimensional changes.

By agreement between the manufacturer and the purchaser, castings with chilled edges or excessive carbides may be annealed at 1750 to 1900°F (955 to 1040°C) for 1⁄2 to 5 h, followed by uniform cooling, preferably in still air.

Austenitic Gray Iron Magnetic Property in ASMT A436

A convenient shop test for differentiating the various types of austenitic gray iron is based on the fact that a ground face of either the test bars or the castings of Types 1, 2, and 4 will not attract a small steel horseshoe-type magnet, that is normally attracted to steel. Types 1*b*, 2*b*, 3, and 5 may be attracted to a magnet. This nonmagnetic test is a convenient qualitative test only for Types 1, 2, and 4 and shall not be used as a basis for acceptance. In the event that nonmagnetic castings are specified, the magnetic permeability test shall be used. The specific test conditions and magnetic permeability limits shall be agreed upon between the manufacturer and the purchaser.

Austenitic Gray Iron castings shall not be repaired by welding, plugging, or other methods without written permission from the purchaser.

Austenitic Gray Iron Typical Casting Application:

- Pump and valve
- piston ring inserts
- bearings
- cylinder liners

As a professional manufacturer in China, We Casting Quality focus on Metal Parts OEM industry, and

provide solutions and services in Metal Casting field as following:

1. **Sand Casting**
2. **Investment Casting, Lost Wax process**
3. **Shell Casting**
4. **Lost Form Casting**
5. **CNC Machining**
6. **CAD Design**
7. **Tools/Mold Design**

Material Supplied

- Cast Iron Castings (Grey Iron, Malleable Iron, Ductile Iron)
- Carbon Steel and Alloy Steel Castings
- Stainless Steel and Duplex Stainless Steel Castings
- Aluminum Castings
- Bronze and Brass Castings
- Titanium and Cobalt Alloy Castings

What We Can Do

- **Design Ability**
  Our engineers will help you to improve the designs based on casting technology, then The simulation software will be processed to verify the casting pouring system. Pro/E, Solidworks, AutoCAD and ProCast are available in Casting Quality Industrial.
- **Saving Cost**
  Some manufacture processes may lead high cost. We will analyze the designs and advise the suitable methods to our customers. The best solution will be adopted.
- **Quality Control**
  From the raw material selecting to bulk production processing, all procedures will follow PPAP program if necessary. The certificates will be provided including chemistry, hardness, mechanical property or NDT testing.
- **Production Capacity**
  The max iron/steel castings can reach 30tons in weight, meanwhile the minus casting is around 1 gram only.
  We also have prototyping and 3D scanning ability for sample plan.
- **Logistic Service**
  The products will be delivered directly to customer's workshop, which will save plenty of work for clients.

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