



Gray Iron in ASTM A278

All Gray Iron castings in ASTM A278 are suitable for use up to 450°F (230°C), and class 40, 45, 50, 55 and 60 castings are suitable above 450-650°F(230-350°C). it also need heat treatment but other gray iron don't require stress relieving.

Reference Casting Standards:

ASTM A278: Standard Specification for Gray Iron Castings for Pressure-Containing Parts for Temperatures Up to 650°F (350°C)

Gray Iron castings can be produced in Casting Quality Industrial:

- n Sand Casting
- n Shell Casting
- n Lost Form Casting
- n Centrifugal casting



Gray iron standard grades in ASTM A278

Tensile Requirements, min		Tensile Requirements (Si), min	
Casting Grade	Tensile Strength, ksi,min	Casting Grade	Tensile Strength, Mpa,min
ASTM A278 Class No.20	20	ASTM A278 Class No.150	150
ASTM A278 Class No.25	25	ASTM A278 Class No.175	175
ASTM A278 Class No.30	30	ASTM A278 Class No.200	200
		ASTM A278 Class No.225	225
ASTM A278 Class No.35	35	ASTM A278 Class No.250	250
ASTM A278 Class No.40	40	ASTM A278 Class No.275	275
ASTM A278 Class No.45	45	ASTM A278 Class No.300	300
		ASTM A278 Class No.325	325
ASTM A278 Class No.50	50	ASTM A278 Class No.350	350
ASTM A278 Class No.55	55	ASTM A278 Class No.380	380
ASTM A278 Class No.60	60	ASTM A278 Class No.415	415

Chemical Requirements in ASTM A278:

Not defined details in standard. But the chemical composition need Carbon Equivalent:

ASTM A278 Class 40, 45, 50, 55 and 60 castings intended for service above 450°F (230°C) shall have a maximum carbon equivalent of **3.8 %** as calculated from the equation **CE = %C + 0.3 (%Si + %P)**. The maximum phosphorus and sulfur contents shall be 0.25 % and 0.12 %, respectively.

ASTM A278 Class 275, 300, 325, 350, 380, and 415 castings intended for service above 230°C shall have a maximum carbon equivalent of **3.8 %** as calculated from the equation **CE = %C + 0.3 (%Si + %P)**. The maximum phosphorus and sulfur contents shall be 0.25 % and 0.12 %, respectively.



ASTM A278 Gray Iron Heat treatment requirement: it's very important for ATM A278 material

- I **Stress Relieving process:** A278 Castings intended for use above 450°F (230°C) shall be stress-relieved by placing them in a suitable furnace at a temperature not exceeding 400°F (200°C) and heating them uniformly to the temperatures and for the times. The heating and cooling rates shall be uniform and shall not be more than 400°F/h (250°C/h) for castings of 1 inch (25 mm) maximum section. For heavier sections the maximum heating and cooling rates in degrees Fahrenheit per hour shall be 400 divided by the maximum section thickness.

ASTM A278 CLASS	Metal Temperature, °F	Holding Time, hours	
40, 45, 50, 55, 60	1050 to 1200 °F	2 hours, (min)	12 hours (max)
(275, 300, 325, 350, 380, 415)	565 to 650 °C		

I **Heat Treatment and Cooling Rate:**

- n A278 Castings of Class 45,50,55, and 60, which are to be used at temperatures below 450°F, may be heat treated in accordance stress relieving proces or they shall be cooled in the mold to 500°F at an average rate of not more than 100°F/h for castings up to 1 in. in section. For heavier sections the maximum cooling rate in degrees Fahrenheit per hour shall be 100 divided by the maximum section thickness.
- n A278 Castings of Class 275, 300, 325, 350, 380, and 415, which are to be used at temperatures below 230°C, may be heat treated in accordance with stress relieving or they shall be cooled in the mold to 250°C at an average rate of not more than 50°C/h for castings up to 25-mm in section. For heavier sections the maximum cooling rate in degrees Celsius per hour shall be 1250 divided by the maximum section thickness. www.castingquality.com



ASTM A278 Gray Iron Typical Casting Application:

Heat Exchange equipment, such as bonnet and connection parts. www.castingquality.com

No detailed requirement about chemistry in ASTM A278 Standards, but we will suggest the chemistry as our experience in Casting industry; pls follow the material ASTM A48

Similar Gray Iron Casting Grades in whole world: www.castingquality.com

Index	Country	Grey Iron Grade						
1	China	—	HT350	HT300	HT250	HT200	HT150	HT100
2	Japanese	—	FC350	FC300	FC250	FC200	FC150	FC100



3	USA	NO.60	NO.50	NO.45	NO.35 NO.40	NO.30	NO.25	NO.20
4	Russia	C440	C435	C430	C424/C425	C418/C420/C421	C415	C410
5	Germany	GG40	GG35	GG30	GG25	GG20	GG15	GG10
6	Italy	—	G35	G30	G25	G20	G15	G10
7	France	FGL400	FGL350	FGL300	FGL250	FGL200	FGL150	—
8	England	400	350	300	260	180/220	150	100
9	Poland	Z140	Z135	Z130	Z125	Z120	Z115	—
10	India	FG400	FG350	FG300	FG260	FG200	FG150	—
11	Romania	FC400	FC350	FC300	FC250	FC200	FC150	—
12	Spanish	—	FG35	FG30	FG25	FG20	FG15	—
13	Belgium	FGG40	FGG35	FGG30	FGG25	FGG20	FGG15	FGG10
14	Australia	T400	T350	T300	T260	T220	T150	—
15	Sweden	O140	O135	O130	O125	O120	O115	O110
16	Hungary	OV40	OV35	OV30	OV25	OV20	OV15	—
17	Bulgaria	—	Vch35	Vch30	Vch25	Vch20	Vch15	—
18	ISO	—	350	300	250	200	150	100
19	COPANT	FG400	FG350	FG300	FG250	FG200	FG150	FG100
20	Taiwan(CN)	—	—	FC300	FC250	FC200	FC150	FC100
21	Holand	—	GG35	GG30	GG25	GG20	GG15	—
22	Luxemburg	FGG40	FGG35	FGG30	FGG25	FGG20	FGG15	—
23	Austria	—	GG35	GG30	GG25	GG20	GG15	—
24	Europa-Norm		EN-GJL-350	EN-GJL-300	EN-GJL-250	EN-GJL-200	EN-GJL-150	

www.castingquality.com

As a professional casting manufacture, Qingdao Casting Quality Industrial pay much attention to the quality and technology, our products are much more casting and forging parts. We are mainly do Sand Casting, Investment Casting (Lost Wax Casting or Precision Casting) and Die Casting .Today, its products are marketed globally through many countries.

Our Services

Casting Quality focus on Metal Parts industry, we provide professional service in Metal Casting field.

Sand Casting

Investment Casting

Shell Casting

CNC Machining

CAD Design

Tools/Mold Design

Many buyers from all over the world purchase products from China. But do you know the quality of products in China? Maybe you only pay the surface and price, but the inner quality is lost .



Housing Casting Design in Solidworks

What makes Casting Quality the best?

Innovation

Our engineers are more than just designers....they're pioneers. Our team use CAD/CAM to do the simulation of casting parts .Through the advanced technology, we can know the weight and structure . We also visited so many factories to know their difference and improve our products every year.

Quality

We're obsessed with quality. Casting Quality constantly strives to exceed our customers' expectations in durability and performance. In fact, we will control the whole process from the original material to the finished parts , include the technology .Uniquely-designed Quality Control System focuses on ensuring four product goals: 1) Eligible Chemistry , 2) Hardness 3) Property and 4) Affordable Pricing. The result is the best casting products value in the industry.

Service

We're in Qingdao,China, It has convenient transportation of road and sea. Courteous service is part of who we are, and we do it better than anyone in the industry. With Casting Quality you can expect friendly, knowledgeable, and prompt customer service.

Fulfillment

Shipping orders complete and on-time is of paramount importance to our customers. We will count the delivery date and result before accept your order. Casting Quality consistently ranks as one of the best in speed of delivery and fill rates.

SERVICE IN QINGDAO CASTING QUALITY INDUSTRIAL

- I SAND CASTING**
- I INVESTMENT CASTING**
- I SHELL CASTING**
- I PERMANENT MOLD CASTING**
- I CNC MACHINING**
- I CAD/CAM DESIGN**