

48th Census of World Casting Production

Steady Growth in Global Output

Worldwide casting production continued to grow in 2013, up more than 3.4 million metric tons, an increase of 3.4% in comparison to 2012.

A MODERN CASTING STAFF REPORT

In 2013, global production increased to more than 103 million metric tons, an increase of 3.4% when compared to the previous year, according to this year's *MODERN CASTING* Census of World Casting Production. The 103.2 million metric tons of metal castings produced in 2013 represents an increase of 3.43 million

tons. This rate of growth is a slight bump up from 2012's 2.4% boost.

Of the 31 countries that provided data for the past two years, 18 reported a contraction in annual volumes when comparing 2013 to 2012. Poland increased its production by 22.1%, with gains across the board in terms of alloys. On the red side of the ledger, Pakistan saw the largest decline in production,

with its metalcasting industry contracting by 18.8%. Among the top-10 countries in total output, Brazil had the highest boost in 2013 with an increase of 7.4% in production. The rebound came a year after South America's only entry in the global survey saw a 16.9% decrease in total production.

China increased its total production by two million metric tons to a total of



World Totals (metric tons)

Gray Iron	Ductile Iron	Malleable Iron	Steel	Copper Base	Aluminum	Magnesium	Zinc	Other Nonferrous	Total
47,844,190	25,045,669	925,565	11,111,572	1,783,402	15,358,327	175,756	453,861	525,672	103,223,514

The Americas (metric tons)

Country	Gray Iron	Ductile Iron	Malleable Iron	Steel	Copper Base	Aluminum	Magnesium	Zinc	Other Nonferrous	Total
Brazil	1,825,000	746,300	-	232,500	17,700	241,700	4,600	3,600	-	3,071,400
Canada	377,789	-	-	91,983	14,536	220,729	-	-	-	705,037
Mexico**	771,700	58,947	-	78,746	140,701	600,469	109	1,007	-	1,651,679
United States	4,083,000	4,251,500	81,250	1,422,850	321,400	1,682,000	108,000	238,400	61,600	12,250,000

Europe (metric tons)

Country	Gray Iron	Ductile Iron	Malleable Iron	Steel	Copper Base	Aluminum	Magnesium	Zinc	Other Nonferrous	Total
Austria	40,751	116,966 ^B	-	13,084	-	125,768	5,818	-	14,408	316,795
Belgium	35,000	5,800	-	30,600	-	646 ^C	-	-	-	72,046
Bosnia & Herzegovina	9,738	1,675	-	4,385	-	7,158 ^C	-	-	-	22,956
Croatia	33,900	8,600	100	200	16,400	19,781	-	30	-	79,011
Czech Republic	169,564	48,202	8,605	76,380	6,609	87,744	-	10,182	1,072	408,358
Denmark**	31,800	47,400	-	-	1,273	3,172	-	-	290	83,935
Finland	19,300	37,000	-	13,900	4,346	2,996	-	258	-	77,800
France	635,414	703,141	-	80,688	17,618	290,721	-	17,765	2,819	1,748,166
Germany	2,381,462	1,541,737	30,243	207,585	68,523	885,661	16,371	55,142	3	5,186,727
Hungary	30,900	39,400	13	5,000	2,333	97,960	331	3,798	170	179,905
Italy	689,000	387,600 ^B	-	69,700	63,122	695,697	-	6,729	59,120	1,970,968
Norway	13,613	37,183	-	2,493	-	6,474 ^C	-	-	-	59,763
Poland	700,000	156,000	1,100	55,000	6,000	340,000	-	8,000	-	1,266,100
Portugal	33,140	67,641	-	7,557	9,502	20,014	-	1,073	-	138,927
Romania	25,385	3,024	875	15,420	4,216	48,725	5,050	175	168	103,038
Serbia*	37,251	15,162	10,328	9,050	2,220	4,958	-	-	7,528	86,497
Slovakia**	2,700	18,200	-	4,100	-	46,000 ^C	-	-	-	71,000
Slovenia	77,500	34,900	3,800	31,400	59,800	35,521	-	2,650	-	245,571
Spain	321,300	579,700	5,100	75,300	11,756	110,601	-	8,288	-	1,112,045
Sweden	163,000	44,900	-	20,400	10,300	35,700	1,400	6,500	-	282,200
Switzerland	15,900	29,600	-	1,800	1,207	15,646	4,960	-	-	69,113
Ukraine	360,000	120,000	35,000	470,000	40,000	250,000	12,000	20,000	58,000	1,365,000
United Kingdom	121,000	175,000	650	64,000	9,200	101,600	3,400	7,900	1,000	483,750

Asia (metric tons)

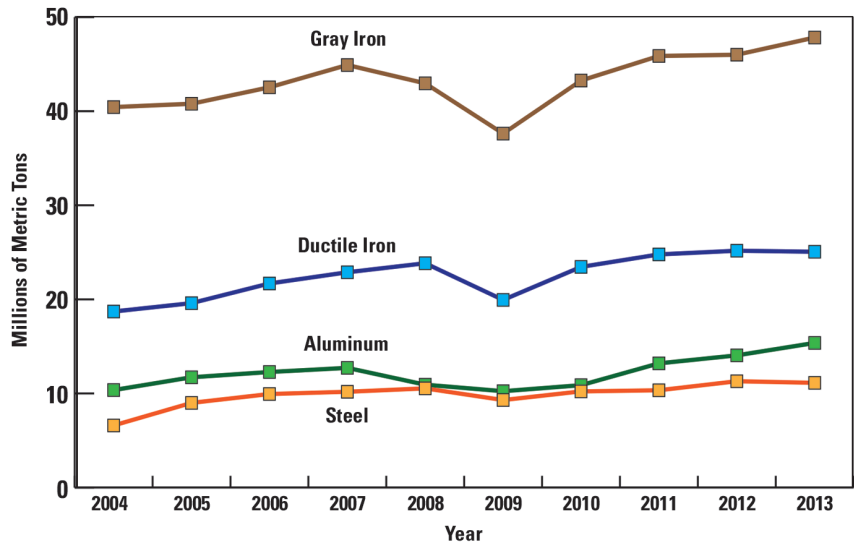
Country	Gray Iron	Ductile Iron	Malleable Iron	Steel	Copper Base	Aluminum	Magnesium	Zinc	Other Nonferrous	Total
China	20,550,000	11,600,000	600,000	5,500,000	750,000	5,200,000	-	-	300,000	44,500,000
India	6,700,000	1,000,000	60,000	1,100,000	-	950,000 ^C	-	-	-	9,810,000
Japan	2,135,794	1,683,250	45,001	181,679	76,611	1,382,015	-	27,293	6,394	5,538,037
Korea	1,086,400	705,100	6,000	164,100	26,400	560,900	-	-	13,100	2,562,000
Pakistan	150,000	15,000	-	35,000	10,000	10,000	-	-	-	220,000
Russia	2,800,000	-	-	700,000	-	600,000 ^C	-	-	-	4,100,000
Taiwan	560,989	190,941 ^B	-	75,872	42,429	280,571	6,748	-	-	1,157,550
Thailand	72,400	28,800	29,500	29,800	26,100	105,400	-	24,400	-	316,400
Turkey	600,000	500,000	8,000	135,000	14,000	270,000	-	16,000	-	1,543,000

Africa (metric tons)

Country	Gray Iron	Ductile Iron	Malleable Iron	Steel	Copper Base	Aluminum	Magnesium	Zinc	Other Nonferrous	Total
South Africa*	161,000	59,000	-	118,000	14,300	21,000	300	1,400	-	375,000

* 2012 data ** 2011 data A) Includes magnesium B) Includes malleable iron C) All nonferrous

TOTAL CASTING TONNAGE BY ALLOY



44.5 million. That boost represents a large majority of the overall increase in global production, meaning China continued to increase its share of the global market. Meanwhile, the U.S., the world's second largest producer, saw its tonnage increase by 3.9% to 12.25 million metric tons. While the top two producing nations saw increases, other top metalcasting countries had production headed south in 2013. France, Germany and Russia reported 3% to 5% decreases.

India remained No. 3 in total production at 9.81 million tons. Spots 4 through 10 remained unchanged, with Japan producing 5.54 million metric tons, Germany 5.19 million, Russia 4.1 million, Brazil 3.07 million, Korea 2.56 million, Italy 1.97 million and France 1.75 million. The top-10 nations produced 88% of the world's castings, a figure that remains unchanged from 2012.

The U.S. saw a 4.4% increase in its productivity per site, with its 2,001 metalcasting facilities averaging 6,122 metric tons. Germany, the world leader in per plant production at 8,659, experienced a negligible increase of 41 metric tons per plant.

China and India, the two countries with the greatest number of facilities, reported gains of 4.73% and 2.7%. Productivity is calculated as total tonnage divided by the number of plants reported.

Total production of iron increased, with gray iron growing 4.6%, and ductile iron expanding by 1.3%, while malleable iron fell 27.1%. Steel output dropped by 0.1%, while aluminum production jumped by 9.9%.

The data reported in the 48th Census of World Casting Production is supplied by each nation's metalcasting association or similar representatives. Countries that did not participate this year were Denmark, Mexico, Serbia, Slovakia and South Africa. These countries remain listed according to the last year they participated. Mongolia, which has not submitted data since 2009, has been removed from the list. Thailand returned to the census after an extended absence, reporting 316,400 metric tons.

Mexico, Ukraine and Turkey remain just outside the top-10 countries in

Metalcasting Plants by Nation & Trends

Country	Iron	Steel	Nonferrous	Total	'08 Total	'03 Total
Austria	25	4	33	43	77	96
Belgium	12	6	7	25	33	39
Bosnia and Herzegovina	7	4	4	15	0	0
Brazil	500	148	704	1,352	1,340	1,000
Canada	41	29	110	180	185	195
China	17,000	5,000	8,000	30,000	30,000	12,000
Croatia	26	5	27	58	41	41
Czech Republic	86	34	63	183	200	194
Denmark**	9	-	11	20	17	18
Finland	14	5	16	35	31	43
France	89	36	303	428	499	529
Germany	258 ^A	-	341	599	600	651
Hungary	27	19	97	143	190	210
India	-	-	-	4,600	4,700	4,500
Italy	149	25	913	1,087	1,167	1,139
Japan	817	75	1,193	2,085	1,702	1,713
Korea	525	146	239	910	873	769
Mexico**	175	167	339	681	-	1,787
Norway	7	3	6	16	20	23
Pakistan	1,500	40	100	1,640	-	-
Poland	185	48	255	488	430	454
Portugal	31	7	30	68	92	115
Romania	40	39	55	134	176	343
Russia	-	-	-	1,200	1,900	1,900
Serbia	12	8	18	38	-	-
Slovakia**	12	7	32	51	-	-
Slovenia	8	2	5	15	78	53
South Africa*	63	26	91	180	255	269
Spain	48	30	52	130	143	306
Sweden	34	13	77	124	131	145
Switzerland	18	4	50	72	63	60
Taiwan	-	-	-	-	848	894
Thailand	280	40	260	580	476	73
Turkey	603	66	366	1,035	1,246	1,057
Ukraine	285	305	310	900	1,070	960
United Kingdom	221 ^A	-	205	426	475	524
United States	640	360	1,001	2,001	2,170	2,620
TOTAL	23,745	6,703	15,313	51,561	51,228	34,720

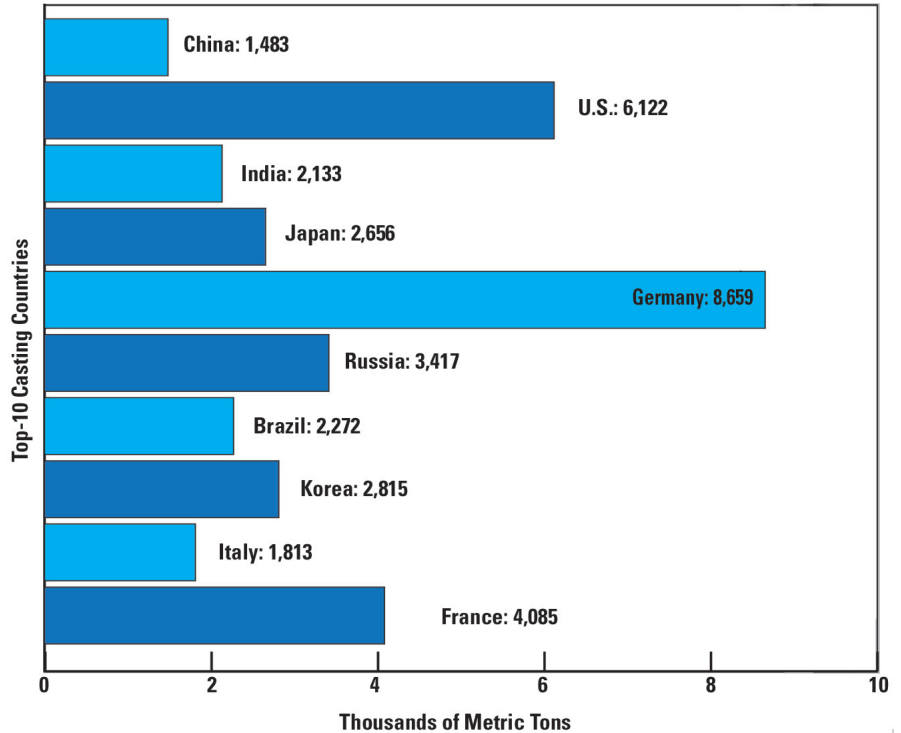
*2012 data ** 2011 data A) Total ferrous

AVERAGE PRODUCTION PER PLANT

total production. Depending on economic conditions in the next few years, however, the three countries could threaten to unseat one or more of the more established metalcasting countries like France and Italy.

Ups & Downs Across the Globe

Global casting production grew in 2013, but other than the large gains in China, total tonnage increased by less than a half-million metric tons. After an impressive 15.1% boost in total production in 2012, the U.S. market increased at a more modest pace. While the global economy continues to steady itself in the years after the recession, economic volatility meant big losses and gains for certain countries. Smaller producers were more likely to experience losses or gains in the double digits, while the majority of the world's largest producers reported only steady growth or slight contraction. The countries in the top 10 reported a total growth rate of 1.9%, which could be seen as a sign that the bulk of worldwide volatility is found in smaller markets. **MC**



Germany remains far and away the world's leader in productivity per plant, while the U.S. experienced slight gains in 2013. China and India, the nations with the most total facilities, also increased average productivity, but remain behind a majority of the world's top 10.

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
TOP 10 CASTING PRODUCERS


1. China 44,500,000 metric tons

Gray iron: 20,550,000 tons
Ductile iron: 11,600,000 tons
Steel: 5,500,000 tons
Nonferrous: 6,250,000 tons


2. U.S. 12,250,000 metric tons

Gray iron: 4,083,000 tons
Ductile iron: 4,251,500 tons
Steel: 1,422,850 tons
Nonferrous: 2,411,400 tons


3. India 9,810,000 metric tons

Gray iron: 6,700,000 tons
Ductile iron: 1,000,000 tons
Steel: 1,100,000 tons
Nonferrous: 950,000 tons


4. Japan 5,538,037 metric tons

Gray iron: 2,135,794 tons
Ductile iron: 1,683,250 tons
Steel: 181,679 tons
Nonferrous: 1,492,313 tons


5. Germany 5,186,727 metric tons

Gray iron: 2,381,462 tons
Ductile iron: 1,541,737 tons
Steel: 207,585 tons
Nonferrous: 1,025,700 tons

6. Russia 4,100,000 metric tons

All iron: 2,800,000 tons
Steel: 700,000 tons
Nonferrous: 600,000 tons

7. Brazil 3,071,400 metric tons

Gray iron: 1,825,000 tons
Ductile iron: 746,300 tons
Steel: 232,500 tons
Nonferrous: 576,600 tons

8. Korea 2,562,000 metric tons

Gray iron: 1,086,400 tons
Ductile iron: 705,100 tons
Steel: 164,100 tons
Nonferrous: 600,400 tons

9. Italy 1,970,968 metric tons

Gray iron: 689,000 tons
Ductile iron: 387,600 tons
Steel: 697,000 tons
Nonferrous: 824,668 tons

10. France 1,748,166 metric tons

Gray iron: 635,414 tons
Ductile iron: 703,141 tons
Steel: 80,688 tons
Nonferrous: 328,923 tons

Casting Shipments (value in '000s of U.S. dollars)

Country	Gray Iron	Ductile Iron	Malleable Iron	Steel	All Nonferrous	Total
Austria	581,250 ^A	-	-	-	1,095,000	1,676,250
Brazil	6,420,000	-	-	1,430,000	3,750,000	11,600,000
China	-	-	-	-	-	89,700,000
Finland	48,777	108,232	-	112,583	110,078	379,670
France	3,877,500 ^A	-	-	-	3,341,250	7,218,750
Germany	7,548,875	-	-	1,548,375	6,383,000	15,480,250
Hungary	232,500 ^A	-	-	-	355,000	600,000
Italy	3,125,000 ^A	-	-	-	4,937,500	8,062,500
Japan	3,824,000	4,197,000	177,000	1,166,000	10,002,000	19,366,000
Norway	63,750	132,500	-	42,500	55,000	293,750
Portugal	61,375	126,125	-	59,750	-	247,250
Spain	2,160,000 ^A	-	-	-	937,500	3,097,500
Thailand	105,096	51,096	52,822	57,677	374,000	640,691
Turkey	887,500	875,000	40,000	437,500	1,775,000	4,015,000
Ukraine	1,116,000	440,000	138,000	1,700,000	1,790,000	5,184,000
United States	5,300,000	7,193,000	163,000	4,295,000	18,106,000	35,057,000
TOTAL	35,351,623	13,122,953	570,822	10,849,385	53,011,328	202,618,611

A) All ferrous

Total Production Volume Trend (metric tons)

Country	2013 Total	2012 Total	+/- % vs. 2012	2008 Total	+/- % vs. 2008
Austria	316,795	292,381	8.4	355,134	-10.8
Belgium	72,046	75,164	-4.1	116,542	-38.2
Bosnia & Herzegovina	22,956	24,878	-7.7	-	-
Brazil	3,071,400	2,859,898	7.4	3,355,232	-8.5
Canada	705,037	734,414	-4	856,316	-17.7
China	44,500,000	42,500,000	4.7	33,500,000	32.8
Croatia	79,011	53,797 ^{***}	46.9	72,448	9.1
Czech Republic	408,358	424,358	-3.8	536,789	-23.9
Denmark	83,935 ^{**}	-	-	87,604	-4.2
Finland	77,800	85,507	-9	152,888	-49.1
France	1,748,166	1,800,156	-2.9	2,388,038	-26.8
Germany	5,186,727	5,214,114	-0.5	5,783,691	-10.3
Hungary	179,905	186,099	-3.3	149,772	20.1
India	9,810,000	9,344,400	5	6,840,500	43.4
Italy	1,970,968	1,959,680	0.6	2,638,011	-25.3
Japan	5,538,037	5,342,837	3.7	5,653,798	-2
Korea	2,562,000	2,435,800	5.2	2,065,900	24
Mexico	1,651,679 ^{**}	-	-	1,827,665	-9.6
Norway	59,763	58,375	2.4	113,975	-47.6
Pakistan	220,000	271,000	-18.8	-	-
Poland	1,266,100	1,036,800	22.1	936,600	35.2
Portugal	138,927	146,082	-4.9	119,249	16.5
Romania	103,038	115,818	-11	123,946	-16.9
Russia	4,100,000	4,300,000 ^{**}	-4.7	7,800,000	-47.4
Slovakia	71,000 ^{**}	-	-	45,445	56.2
Slovenia	245,571	192,367	27.7	182,404	34.6
South Africa	375,000 [*]	-	-	368,700	1.7
Spain	1,112,045	1,124,684	-1.1	1,359,113	-18.2
Sweden	282,200	283,400	-0.4	368,700	-23.5
Switzerland	69,113	69,452	-0.5	106,151	-34.9
Taiwan	1,157,550	1,298,149	-10.8	1,487,010	-22.2
Thailand	316,400	-	-	304,100	4
Turkey	1,543,000	1,445,000	6.8	1,265,080	22
Ukraine	1,365,000	1,532,000	-10.9	974,170	40.1
U.K.	483,750	520,300	-7	618,200	-21.7
U.S.	12,250,000	11,788,866	3.9	10,783,829	13.6
TOTAL	103,229,774	99,798,587	3.4	93,449,270	10.5

* 2012 Results ** 2011 Results
 *** 2010 Results

Note: The total production may differ from aggregate of national totals because countries with only one reported year were excluded.