

CENSUS OF WORLD CASTING PRODUCTION

Global Casting Production Growth Stalls

Worldwide casting production grew by less than half a percent for the second year in a row in 2016. **A MODERN CASTING STAFF REPORT**

In 2016, worldwide casting production was 104.4 million metric tons, a near match to 2015's reported 104.1 million metric tons, according to this year's *Modern Casting Census of World Casting Production*. Casting growth from 2014 to 2015 was 0.4%, and from 2015-2016, it was 0.2%.

This year's census includes 36 nations from four continents. Of the 32 countries with data for the last two years, 14 reported an uptick in production. The information in this census comes from surveys collected from various country's metalcasting associations and organizations. The data reflects casting shipments for the year 2016, the latest year in which all data is available.

The world's top 10 casting producing nations produced 91.6 million metric tons of the total 104.4 million metric tons.

The China Foundry Association reported a 5.4% increase since 2015, putting its total production at 47.2 million metric tons—45% of total world casting production. The Institute of Indian Foundrymen reported a 5.4% increase in production in India, to 11.35 million metric tons, gaining space ahead of the U.S., which has seen lower tonnage shipped in 2015



and 2016 compared to 2014 due to flagging production for iron-heavy industries such as agriculture, oil and mining. The U.S. is expecting growth of 2.8% in tonnage and 4.7% in casting sales in 2018.

The remaining 2016 top 10 casting nations by tonnage are Japan at 5.2 million, Germany at 5.2 million, Russia at 3.9 million, Republic of Korea at 2.6 million, Mexico at 2.56 million (2015 data), Brazil at 2.1 million, and Italy at 2.1 million.

Worldwide, the production of ferrous castings, including gray iron, ductile iron, malleable iron, and steel, was down by 1%. Considering ferrous casting makes up nearly 80% of total tonnage, the impact of was felt by many nations. However, nonferrous production grew by 5.7%, highlighting the continued trend of using lighter metals in what had been typically ferrous applications. **MC**

World Totals (metric tons)

Gray Iron	Ductile Iron	Malleable Iron	Steel	Copper Base	Aluminum	Magnesium	Zinc	Other Nonferrous	Total
46,241,871	25,467,378	817,620	10,652,260	1,872,213	17,876,299	317,578	1,005,656	128,056	104,378,931

Individual Countries (metric tons)

Country	Gray Iron	Ductile Iron	Malleable Iron	Steel	Copper Base	Aluminum	Magnesium	Zinc	Other Nonferrous	Total
Austria	42,362	101,770	-	11,284	-	140,840	6,256	-	12,347	314,859
Belgium	26,900	7,200	-	17,400	-	783	-	-	-	52,283
Bosnia & Herzegovina	17,500	9,100	-	1,350	-	10,500	-	-	-	38,450
Brazil	1,257,825	515,875	-	164,200	21,900	136,000	5,800	1,400	-	2,103,000
Canada*	330,841	-	-	90,091	14237	216189	-	-	-	651,358
China	20,350,000	13,200,000	600,000	5,100,000	800,000	6,900,000	-	250,000	-	47,200,000
Croatia	31,100	11,800	-	50	221	25,174	-	25	15	68,385
Czech Republic	158,000	51,800	-	61,000	20,000	98,000	-	1,000	-	389,800
Denmark	20,400	52,500	-	-	779	3,117	-	-	128	76,924
Finland	15,300	33,500	-	8,400	2,630	2,114	-	86	-	62,030
France	531,500	675,200	-	57,000	17,724	324,102	-	20,329	2,340	1,628,195
Germany	2,234,900	1,509,900	-	174,200	78,471	1,096,707	17,398	56,247	1	5,167,824
Hungary	21,700	57,900	-	3,800	1,681	118,246	391	2,985	123	206,826
India	789000	1,180,000	50,000	1,010,000	-	1,220,000	-	-	-	11,350,000
Italy	714,200	381,200	-	57,000	66,081	782,691	7,384	70,474	654	2,079,684
Japan†	2,224,000	1,301,300	41,000	150,100	77,400	1,380,570	-	23,530	5,400	5,203,300
Korea	1,073,500	707,800	3,000	163,100	26,300	623,200	13,100	-	-	2,610,000
Mexico**	815,500	375,800	-	330,790	217,200	735,300	-	85,600	-	2,560,190
Norway	10,900	19,200	-	-	-	6,373	-	-	-	36,473
Pakistan	142,000	24,540	-	42,600	12,400	16,300	-	-	2,200	240,040
Poland	484,000	166,200	-	50,500	6,100	331,500	-	7,600	2,900	1,048,800
Portugal	39,400	93,400	-	7,800	16,000	32,400	-	-	-	189,000
Romania	20,565	4,306	505	6,893	3,590	82,057	5,000	115	137	123,168
Russia	2,000,000	380,000	20,000	800,000	100,000	450,000	100,000	50,000	-	3,900,000
Serbia	26,368	8,220	-	12,125	2,010	10,120	1	42	-	58,886
Slovenia	74,235	30,906	3,100	31,344	947	47,584	26	3,494	65	191,781
South Africa	145,000	163,200 ⁺⁺	-	85,000	7,000	24,000	-	500	-	424,700
Spain	379,900	671,400	-	65,600	15,098	138,591	-	9,079	706	1,280,374
Sweden	159,600	49,500	-	21,215	6,934	43,089	1,482	8,531	-	290,351
Switzerland	35,400	22,800	-	1,100	2,308	12,902	-	989	-	75,499
Taiwan	510,425	187,711	-	66,028	32,662	303,020	-	-	-	1,099,846
Thailand**	72,400	28,800	29,500	29,800	26,100	105,400	-	24,400	-	316,400
Turkey	650,000	655,000	-	166,000	22,500	370,000	-	35,000	-	1,898,500
Ukraine**	400,000	120,000	30,000	580,000	60,000	280,000	15,000	25,000	50,000	1,560,000
U.K.	125,800	178,500	-	40,700	8,500	123,200	3,000	7,000	-	486,700
U.S. Metric	3,210,350	2,490,970	40,515	1,245,790	205,440	1,686,230	142,740	322,230	51,040	9,395,305

* 2014 Results

** 2015 Results

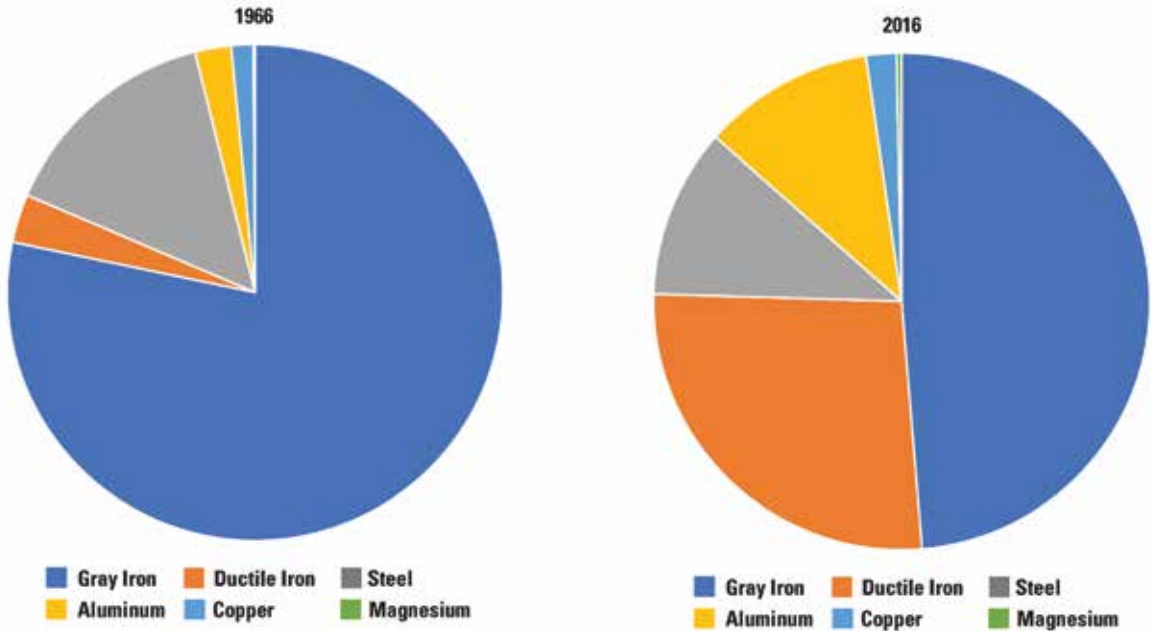
***2013 Results

†Includes cast iron pipe

**Includes white iron

ALLOY TRENDS OF A HALF CENTURY

The picture of alloy production has changed much in the last 50 years. As shown in the pie graphs below, gray iron (blue), while still the highest produced alloy (by tonnage) has decreased from over three-quarters of the pie to less than half. Meanwhile, ductile iron (orange) and aluminum (yellow) has grown considerably.



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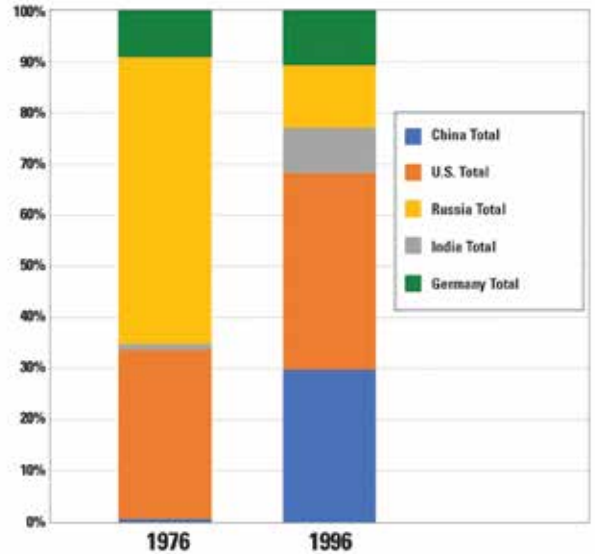
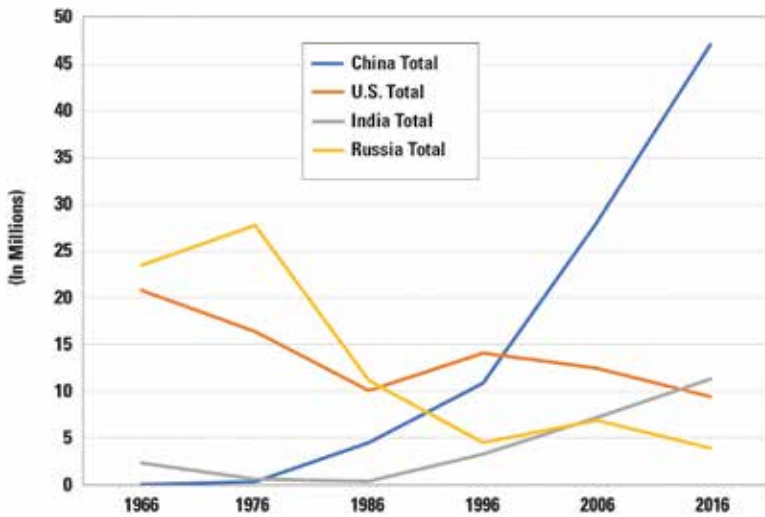
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SHIFTS IN CASTING CONCENTRATIONS

With more than 50 years of worldwide casting production data now accumulated through *Modern Casting's* Census of Casting Production, comparing how casting production has expanded and shifted across the globe is illuminating. Below, we share how casting production has changed for a handful of historically major casting producing nations for which we had data. In the line chart, China and India's 10-year trends are compared to U.S. and Russia during the past 50 years. The bar chart on the right reflects the 20-year time period when both China and India's production shifted from a negligible to a considerable stake.



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Metalcasting Plants by Nation & Trends

Country	Iron	Steel	Nonferrous	2016 Total
Austria	20	3	35	58
Belgium	10	5	6	21
Bosnia & Herzegovina	5	2	4	11
Brazil	408	153	484	1,045
Canada*				175
China	14,000	4,000	8,000	26,000
Croatia	26	5		31
Czech Republic	71		37	108
Denmark	8		7	15
Finland	11	7	13	31
France	86	34	291	411
Germany	195	46	340	581
Hungary	28	9	87	124
India				4,600
Italy	140	37	878	1,055
Japan**				1,612
Korea	523	141	235	899
Mexico**				681
Norway	6	3	6	15
Pakistan	1,580	55	170	1,805
Poland	185	36	240	461
Portugal	23	8	57	88
Romania	35	20	50	105
Russia				1,140
Serbia	11	8	17	36
Slovenia				46
South Africa		79	86	165
Spain	45	29	52	126
Sweden	27	12	59	98
Switzerland	15	2	30	47
Taiwan				-
Thailand*	280	40	260	580
Turkey	439	105	383	927
Ukraine	270	280	290	840
U.K.	216		204	420
U.S.	625	349	987	1,961
TOTAL	19,288	5,468	14,494	46,318

*2014 Results **2015 Results

WORLD CASTING PRODUCTION PER PLANT

The number of metalcasting facilities in the world declined in 2016, following a trend of the last decade of fewer metalcasting facilities making an increasing tonnage of castings. Casting businesses worldwide are consolidating and becoming more efficient. Germany continues to be the highest casting producer per plant, with an average of 8,895 metric tons annually. The U.S. averaged 4,791 metric tons per plant in 2016.

-1.4% **2,216** **2,253**

The total reduction of metalcasting facilities worldwide from 2016 to 2015.

Average world casting production per plant in 2015 in metric tons.

Average world casting production per plant in 2016 in metric tons.