

2017 AIST Basic Oxygen Furnace Roundup

Roundup data is based on actual 2016 operating data.

Company and location	Main line	Facility information			Converter information			
		Year of start-up	Furnace type	Annual capacity (million metric tons/year)	No. converters	New working volume (m³)	Heat size (mt/heat)	Avg. campaign life (heats)

Argentina

Ternium Siderar San Nicolás, B.A.	Carbon flat	1972	LD	3.1	3	156	216	3,850
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Australia

OneSteel Ltd. Whyalla Steelworks Whyalla, S.A.	Carbon long	1964	LD	1.2	2	100	130	3,200
BlueScope Steel Ltd. Port Kembla Works Port Kembla, N.S.W.	Carbon flat and IF	1972	LD	2.8	2	220	280	6,000

Brazil

ArcelorMittal Monlevade João Monlevade, M.G.	Carbon long	1957/1985	LD	1.2	2	98	130	3,500
Tubarão Vitória, E.S.	Carbon flat	1983	LD	7	3	220 (No. 1 and No. 2), 280 (No. 3)	315	4,500
Companhia Siderúrgica Nacional Presidente Vargas Steelworks Volta Redonda, R.J.	Carbon flat	1977	LD	5.6	3	189	230	4,500
Gerdau Açominas Ouro Branco, M.G.	Carbon flat and bar	1986	LD	4.5	2	186	224	5,300
ThyssenKrupp CSA Santa Cruz, R.J.	Carbon flat	2010	LD	5.2	2	340	330	3,800
Usiminas Intendente Câmara No. 1 Ipatinga, M.G.	Carbon flat	1963 (1981 rev.)	LD	1.1	3	58	75	2,262
Câmara No. 2 Ipatinga, M.G.	Carbon flat	1975	LD	3.4	2	134	166	4,332
Vallourec do Brasil Belo Horizonte, M.G.	Carbon tube	1978	LD	0.7	1	59	80	1,500

Canada

Rio Tinto Sorel-Tracy, Que.	Carbon long and round	1986	KOBM	0.6	1	75	115	1,800
ArcelorMittal Dofasco Inc. Hamilton, Ont.	Carbon flat	1978	KOBM	2.7	1	187	320	4,200
Essar Steel Algoma Inc. Sault Ste. Marie, Ont.	Carbon flat	1972/1973	LD	3.2	2	203	238	12,000
Stelco Inc. Lake Erie Works Nanticoke, Ont.	Carbon flat	1980	LD	2.4	2	291	245	25,000

KOBM = combined blowing basic oxygen furnace; SL = sub lance; OG = offgas test; IB = in-blow drop sensor (bomb); TD = turndown test; Interested in becoming a member of the AIST Oxygen Steelmaking Technology Committee? Contact Brian Bliss at bbliss@aist.org.



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Hot metal		Converter operation			Oxygen lance		Environmental		Testing method	Tap procedure
Desulfurization location	% hot metal charge per heat	Slag splash	Bottom elements	Bottom element gases	Lance blow rate (Nm ³ /min.)	Lance tip holes	Hood combustion and gas cleaning type	Charge emission collection	SL, OG, IB, TD	Slag detection used

Ladle	80	No	Yes	N ₂ /Ar	620	5 and 6	Suppressed	Yes	OG, TD	Yes
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Ladle	80	No	Yes	N ₂ /Ar	392	4	Full/dry	Yes	SL, IB, TD	Yes
Torpedo car	80	No	Yes	N ₂ /Ar	917	5 and 6	Suppressed/wet	Yes	SL, IB	Yes

Torpedo car	80	Yes	No	N ₂ /Ar	350/400	4	Full/wet	Yes	OG	Yes
Torpedo car and ladle	90	Yes	Yes	N ₂ /Ar	750–1,166	6	Suppressed/wet	Yes	SL, OG	Yes
Torpedo car and ladle	83	Yes	Yes	N ₂ /Ar	780	5	Suppressed/wet	Yes	SL, OG, TD	Yes
Torpedo car and ladle	85	No	Yes	N ₂ /Ar	767	5	Suppressed	Yes	SL, TD	Yes
Ladle	93	Yes	Yes	N ₂ /Ar	1,300	6	Suppressed/dry	Yes	SL, OG, TD	Yes
Torpedo car and ladle	83	No	Yes	N ₂ /Ar	233	4	Suppressed/wet	Yes	OG (trial), TD	No
Ladle	84	Yes	Yes	N ₂ /Ar	633	4 and 6	Suppressed/wet	Yes	SL, TD	Yes
Ladle	78	No	Yes	N ₂ /Ar	250	3	Full/wet	Yes	OG, TD	Yes

Ladle	85	Yes	Yes	O ₂ , N ₂ , Ar, CH ₄	140	4	Dust collector	Yes	TD	Yes
Torpedo car	76	Yes	Yes	O ₂ , N ₂ , Ar	900	4	Suppressed/wet	Yes	OG	Yes
Torpedo car	76	Yes	No	—	707	5 + 1	Full/wet	Yes	IB	Yes
Ladle	75	Yes	No	N ₂	700	3	Suppressed/wet	Yes	OG, IB, TD	Yes

AHSS = advanced high-strength steel; IF = interstitial-free

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Company and location	Main line	Facility information			Converter information			
		Year of start-up	Furnace type	Annual capacity (million metric tons/year)	No. converters	New working volume (m ³)	Heat size (mt/heat)	Avg. campaign life (heats)

India

Jindal Steel & Power Ltd. Angul, OR	Carbon flat and bar	2017	LD	2.6	1	250	250	4,000
JSW Steel Vijayanagar Works, SMS1 Vijayanagar, KA	Carbon flat/IF/Si steel	1999	LD	4	3	123	134	4,500
Vijayanagar Works, SMS2 Vijayanagar, KA	Carbon flat/long products /IF/Si steel	2009/2011	LD	7	4	153	180	3,750
NMDC Ltd. Nagarnar, CG	Carbon flat	2017	LD	3	2	182	175	4,000
Rashtriya Ispat Nigam Ltd. Visakhapatnam Steel Plant, SMS-I Visakhapatnam, AP	Long products	1990	LD	3.5	3	150 (in 2 converters) and 133 (in 1 converter)	141	2,667
Visakhapatnam Steel Plant, SMS-II Visakhapatnam, AP	Long products	2013	LD	2.8	3	150	151	2,953
Steel Authority of India Ltd. Bhilai Steel Plant Bhilai, CG	Long and flat	1984	LD	2.6	3	108	120	8,901
Bokaro Steel Plant Bokaro, JH	Flat	1983	LD	2.9	2	194	270	4,223
IISCO Steel Plant Burnpur, WB	Flat	2015	LD	2.5	3	165	150	2,590
Durgapur Steel Plant Durgapur, WB	Long	1994	LD	2.0	3	133	120	6,175
Rourkela Steel Plant, SMS-II Rourkela, OR	Flat	1996	LD	2.4	3	165	150	6,750
Tata Steel Jamshedpur Works, LD1 Jamshedpur, JH	Long	1983	LD	3.3	2	145	153	5,400
Jamshedpur Works, LD2 Jamshedpur, JH	Flat	1993	LD	4	3	153	160	5,320
Jamshedpur Works, LD3 Jamshedpur, JH	Flat	2012	LD	2.4	2	132	160	7,585
Kalinganagar Works Kalinganagar, OR	Flat	2016	LD	3	2	288	310	N/A

Mexico

Altos Hornos de México Plant 1 Monclova, Coah.	Carbon flat	1971	LD	1.0	3	58	75	1,050
Plant 2 Monclova, Coah.	Carbon flat	1976/1994	LD	3.4	2	125	150	14,000

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Hot metal		Converter operation			Oxygen lance		Environmental		Testing method	Tap procedure
Desulfurization location	% hot metal charge per heat	Slag splash	Bottom elements	Bottom element gases	Lance blow rate (Nm ³ /min.)	Lance tip holes	Hood combustion and gas cleaning type	Charge emission collection	SL, OG, IB, TD	Slag detection used

Ladle	92	Yes	Yes	N ₂ /Ar	1,000	6	Suppressed	Yes	TD	Provision
Ladle	86	Yes	Yes	N ₂ /Ar	430	6	Suppressed	Yes	SL, OG, TD	Yes
Ladle	88	Yes	Yes	N ₂ /Ar	550	6	Suppressed	Yes	SL, OG, TD	Yes
Ladle	90	Yes	Yes	N ₂ /Ar	600	6	Suppressed	Yes	SL, OG	Yes
Ladle	92	Yes	Yes	N ₂ /Ar	400	5	Suppressed	Yes for 2 BOFs, No for 1 BOF	OG	Yes for 2 BOFs, No for 1 BOF
Ladle	91	Yes	Yes	N ₂ /Ar	525	6	Suppressed	Yes	OG	Yes
Ladle	88	Yes	No	—	400	5	Suppressed	No	TD	No
Ladle	91	Yes	Yes	N ₂ /Ar	1,000	6	Suppressed	No	OG	No
Ladle	90	Yes	Yes	N ₂ /Ar	500	6	Suppressed	Yes	OG, TD	Yes
N/A	91	Yes	No	—	400	5	Suppressed	No	OG, TD	No
Ladle	93	Yes	Yes in LD#3 only	N ₂ /Ar	500	5	Suppressed	Yes in LD#3 only	OG, TD	Yes in LD#3 only
Ladle	94	No	Yes	N ₂ /Ar	450, 480	6	Suppressed	Yes	OG, TD	No
Ladle	91	No	Yes	N ₂ /Ar	450	6	Suppressed	Yes	OG, TD	Yes
Ladle	91	Yes	Yes	N ₂ /Ar	450	6	Suppressed	Yes	OG, TD	Yes
Ladle	91	Yes	Yes	N ₂ /Ar	950	6	Suppressed	Yes	OG, TD	Yes

Ladle	75	No	No	N	225	3	Full/wet	No	TD	No
Torpedo car	78	Yes	Yes	Natural gas, Ar, N ₂	480–520	4/5	Suppressed/wet	No	OG, TD	No

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ArcelorMittal Lázaro Cárdenas Las Truchas S.A. de C.V. Lázaro Cárdenas, Mich.	Carbon round	1976	LD	2.6	2	75	120	3,000

Peru

Gerdau Siderperu Chimbote	Carbon	1965	LD	0.5	2	26	29	4,000
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Turkey

Erdemir Group Erdemir Karadeniz Ereğli, Zonguldak	Flat	1965 (1993 Modernization)	LD	3.9	3	107	120	6,740
İsdemir İskenderun, Hatay	Carbon flat and long	1970 (2010 Modernization)	LD	5.3	3	200	200	7,700
Kardemir Karabük, Karabük	Carbon long	1999	LD	3	3	121	120	5,000

United Kingdom

British Steel Scunthorpe Works Wales	Rail/sections	1968	LD	5	3	300	300	4,000
Tata Steel Europe Port Talbot Works Wales	LC AK/tube	1969	LD	4.5	2	286	330	4,000

United States

AK Steel Corp. Ashland Works Ashland, Ky. (idle)	Carbon, IF	1963	LD	2.2	2	128	162	18,000
Dearborn Works Dearborn, Mich.	Carbon flat, IF	1963	LD	2.6	2	185	232	26,000
Middletown Works Middletown, Ohio	Carbon, IF	1969	LD	2.6	2	169	203	20,000
ArcelorMittal Burns Harbor, Ind.	Carbon, IF	1969/1970	LD	4.6	3	255	278	7,000
Cleveland – East Cleveland, Ohio	Carbon, IF, AHSS	1961	LD	2.3	2	217	248	25,000
Cleveland – West Cleveland, Ohio	Carbon, AHSS	1956	LD	1.8	2	130	198	15,000
Indiana Harbor No. 2 SP East Chicago, Ind.	Carbon flat	1972	LD	2	2	164	188	21,661
Indiana Harbor No. 3 SP East Chicago, Ind.	Carbon flat, IF	1970	LD	3.6	2	223	250	13,451
Indiana Harbor No. 4 SP East Chicago, Ind.	Carbon flat, IF	1966	LD	3.2	2	185	227	17,295
Riverdale, Ill.	Carbon flat	1959	LD	1	2	57	82	12,000

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Hot metal		Converter operation			Oxygen lance		Environmental		Testing method	Tap procedure
Desulfurization location	% hot metal charge per heat	Slag splash	Bottom elements	Bottom element gases	Lance blow rate (Nm ³ /min.)	Lance tip holes	Hood combustion and gas cleaning type	Charge emission collection	SL, OG, IB, TD	Slag detection used
Ladle	83	Yes	BOF#1 only	N ₂ /Ar	380-450	5	Full/wet	No	SL, IB, TD	Yes

None	88	Yes	No	N ₂	87	3	Full/dry	No	—	No
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Torpedo car	81	Yes	Yes	N ₂ /Ar	420	5	Suppressed/wet	Yes	SL, OG	Yes
Ladle	81	Yes	Yes	N ₂ /Ar	700	6	Suppressed/wet	Yes	SL, OG	Yes
Ladle	80	Yes	Yes	N ₂ /Ar	400	6	Suppressed/wet	Y	SL/TD	Y

Ladle	90	Yes	Yes	N ₂ /Ar	950	5/6	Suppressed/wet	Yes	SL	Yes
Ladle	86	Yes	Yes	N ₂ /Ar	1,050	5/6	Suppressed/wet	Yes	SL	Yes

Ladle	72	Yes	No	—	453	3	Suppressed/wet	Yes	SL, OG, IB, TD	Yes
Ladle	73	Yes	No	—	637	4	Full dry	Yes	IB	Yes
Ladle	72	Yes	No	—	624	4	Suppressed/wet	Yes	SL, OG, IB, TD	Yes
Ladle	80	Yes	No	—	792	5	No. 1 & No. 2 Full, No. 3 Suppressed/wet	Yes	OG	Yes
Ladle	78	Yes	No	—	707	4	Suppressed/wet	Yes	OG, IB	Yes
Ladle	78	Yes	No	—	509	5	Full/dry	Yes	OG, IB	Yes
Iron ladle	84	Yes	No	—	651	4	Suppressed/wet	Yes	SL, OG	Yes
Iron ladle	81	Yes	No	—	665	4	Full/dry	Yes	IB, TD	Yes
Iron ladle	84	Yes	No	—	685	5	Full/wet	Yes	SL, IB	Yes
Steel ladle	77	No	No	—	226	3 / 4	Full/dry	Yes	IB	No

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United States Steel Corporation Gary Works, No. 1 BOP Shop Gary, Ind.	Carbon	1965	LD	3.8	3	143	202	13,000
Gary Works, No. 2 Q-BOP Shop Gary, Ind.	Carbon, IF	1973	QBOP	3.6	3	154	202	8,000
Granite City Works Granite City, Ill.	Carbon	1967	LD	2.6	2	204	202	25,000
Great Lakes Works Ecorse, Mich.	Carbon, IF	1970	LD	3.1	2	153	225	20,000
Mon Valley Works, Edgar Thomson Plant Braddock, Pa.	Carbon, IF	1972	LD	2.6	2	183	225	15,000

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Desulfurization location	% hot metal charge per heat	Slag splash	Bottom elements	Bottom element gases	Lance blow rate (Nm ³ /min.)	Lance tip holes	Hood combustion and gas cleaning type	Charge emission collection	SL, OG, IB, TD	Slag detection used
Ladle	79	Yes	—	—	566	4	Full/wet	Yes	IB, TD	Yes
Ladle	83	Yes	Yes	O ₂ , N ₂ , Ar, CO ₂ , CH ₄ , C ₃ H ₈	566	—	Full/wet	Yes	IB	Yes
Ladle	75	Yes	No	No	566	5	Full/dry	Yes	IB, OG	Yes
Ladle	77	Yes	No	No	594	4	Full/dry	Yes	IB, OG	Yes
Ladle	73	Yes	No	No	594	3 and 4	Full/wet	Yes	IB, TD	Yes

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