



NAREMA

Jernkontoret

Certified Reference Materials 2024

ELEVATE YOUR steel industry lab practices with Narema's Certified Reference Materials (CRMs)

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Introduction

The production of reference materials in the ECRM- and JK-series is directed by the Nordic CRM Working Group (NCRMWG), with representatives from the Nordic Steel and Iron industry. In 2023 the members are:

A. Carlström-Wängelin Alleima AB, Sandviken, Sweden	W. Hemmings Outokumpu Stainless AB, Avesta, Sweden	M. Khodabandeh-loo Sandvik Coromant AB, Stockholm, Sweden
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In 1938, the production of certified reference materials (CRMs) in the JK-series was initiated in a close co-operation between Jernkontoret (The Swedish Steel Producers' Association) and Metallografiska Institutet (The Metallographic Institute), and four years later in 1942 seven steel CRMs became commercially available. It was also decided that every CRM produced should be given a prefix, namely JK, the abbreviation of Jernkontoret.

Since its foundation back in 1747, Jernkontoret (JK) has been owned jointly by the Swedish steel companies. Jernkontoret represents Sweden's steel industry on issues that relate to education, trade policy, research and development, standardization, energy and environment as well as taxes and levies. Jernkontoret also manages the joint Nordic research in the steel industry. In addition, Jernkontoret draws up statistical information relating to the industry and carries on research into the history of mining and metallurgy.

Oy Narema Ab was founded in 2019, as a consultancy agency and chemical analysis laboratory primarily supporting companies in the Nordic countries in the iron, steel and metal industries as well as mechanical industries. As of 1st of January 2020 the responsibility of the certification of Jernkontoret's reference materials were transferred from Swerim AB to Oy Narema Ab. Certification analyses are carried out in accordance with principles in the ISO Guides 30-35 and ISO 17034. In 1998 the Nordic CRM Working Group became a member of EURONORM CRM Producers Group.

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Euronorm CRM (ECRM) and CRM in the JK Series

CERTIFIED CONCENTRATIONS are given in bold text and in W/W %. Non-certified elements, i.e. elements only given as supplemental information, are normally given in italics and in µg/g, if not stated otherwise. The number of values for the supplemental concentrations varies from 1 to 13 individual determinations.

To request the certificates with detailed information, you have two options:

1. Download the certificates directly from Narema's database on the website, www.narema.fi.
2. Alternatively, you may also place an order for the certificates by contacting us at crm@narema.fi.

For your convenience, we recommend checking the database first. However, if you encounter any issues or have specific requirements, feel free to reach out to us via email.

1. Low alloyed steel

JK 21 - chips, NW 150 g

	C	Si	Mn	P	S	Cr	Ni	Mo	Co	V	Ti	Cu	Al _{Acid Sol}	Al _{Non-acid Sol}	Sn	Nb	N
JK 21	0.1741	0.36	1.46	0.0148	0.011	0.024	0.035	0.004	0.008	0.002	0.0008	0.045	0.032	0.005	0.006	0.0175	0.008

	As	Cd	Pb	Sb	Ta	W	Zn	Zr
JK 21	100	1	10	10	10	6	7	10

ECRM 196-2 - chips, NW 100g, discs 38d x 25 mm

	C	Si	Mn	P	S	Cr	Mo	Ni	Al _{tot}	As	B	Co	Cu
ECRM 196-2	0.0060	1.808	0.364	0.00369	0.00065	0.0282	0.0142	0.0401	0.2167	0.00033	0.00014	0.0138	0.0057

	N	Sn	Ti	V	Ca	Mg	Zn
ECRM 196-2	0.00178	0.00047	0.00253	0.00368	0.00071	0.00075	0.00019

CARBON STEEL

ECRM 197-1 - chips, NW 100 g and disc, 38d x 25 mm 150 g

	C	Si	Mn	P	S	Cr	Mo	Ni	Cu	N	Al _{tot}	As	Co	Sn	Ti
ECRM 197-1	0.219	0.275	0.792	0.0073	0.0232	0.451	0.402	0.148	0.152	0.0114	0.0313	0.0083	0.0135	0.0097	0.0005

	V	Bi	Sb	Pb	Al _{acid sol}
ECRM 197-1	50	0.1	18	3	0.027

JK 3B - chips, NW 150 g

	C	Si	Mn	P	S	Cr	Ni	Mo	N	Cu	Co	Al _{tot}	Sn
JK 3B	0.742	0.251	0.803	0.0101	0.0071	0.0529	0.0591	0.0051	0.0054	0.0175	0.0048	0.0036	0.0044

	Pb	Ti	Sb	As	Ca	Zn	O	Mg	Ag	Bi	V
JK 3B	2	20	7	20	5	3	180	1	0.2	1	20

JK 20A - chips, NW 150 g

	C	S	N	V	W	Pb
JK 20A	1.263	0.0094	0.0027	0.161	1.75	0.160

2. High alloyed steel

ECRM 270-1 - chips, NW 100 g and disc, 38d x 25 mm

	C	Si	Mn	P	S	Cr	Mo	Ni	Co	Cu	N	V	Ce	La
ECRM 270-1	0.0742	1.517	0.540	0.0196	0.0007	20.88	0.2099	10.86	0.0685	0.1076	0.1417	0.0256	0.0487	0.0154

	Al	As	Ba	Dy	Er	Eu	Ga	Gd	Ge	Hf	Ho	Ir	Lu	Mg	Nd	Os	Pr	Pt	Rb
ECRM 270-1	23	34	1.8	0.013	0.0045	< 0.01	21	< 1.3	6	0.02	< 0.002	0.2	< 0.002	9	76	0.4	29.5	0.1	6

	Re	Rh	Ru	Sb	Sc	Sm	Sn	Ta	Tb	Th	Ti	Tl	Tm	U	W	Y	Yb	Zn	Zr
ECRM 270-1	0.4	0.2	2	7	< 0.02	< 0.1	35	0.1	< 0.045	0.002	19	0.006	< 0.002	0.01	244	< 0.18	< 0.003	7.4	2

ECRM 379-1 - chips, NW 100 g and disc, 38d x 25 mm

	C	Si	Mn	P	S	Cr	Mo	Ni	B	Co	Cu	N	Sn	V	Ca	Sb
ECRM 379-1	0.0121	0.393	1.804	0.0166	0.0006	26.79	3.290	30.83	0.00190	0.0390	0.984	0.0550	0.0021	0.0663	0.0033	0.00057

	Al	As	Nb	O	Pb	Ti	Bi	Fe	Ag	Ce	Cs	Ga	Ir	Mg	Nd	Os
ECRM 379-1	246	28	28	27	0.38	14	0.01	356 000	0.7	0.1	0.01	23	0.1	6	0.6	0.07

	Pr	Pt	Rb	Re	Rh	Ru	Sm	Ta	W	Y	Zr
ECRM 379-1	0.2	0.04	4.3	2.4	0.4	1.4	0.6	0.04	91	0.1	3.3

VANADIUM STEEL

ECRM 274-1 - chips, NW 100 g and disc, 38d x 25 mm

	C	Si	Mn	P	S	Cr	Mo	Ni	Cu	N	V	W
ECRM 274-1	1.563	1.057	0.397	0.0148	0.0096	8.036	1.4551	0.077	0.0281	0.0769	4.010	0.0087

	O	Al _{tot}	Co	As	B	Pb	Sb	Sn	Ti
ECRM 274-1	26	25	230	13	5	0.64	2	10	11

DUPLEX STAINLESS STEEL

ECRM 298-2 - chips, NW 100 g and disc, 38d x 25 mm

	C	Si	Mn	P	S	Cr	Mo	Ni	Al	As	B	Co	Cu	N
ECRM 298-2	0.0140	0.331	0.786	0.0210	0.0006	24.91	3.781	6.877	0.0148	0.0028	0.0024	0.0482	0.105	0.277

	Nb	Sn	Ti	V	W	Sb
ECRM 298-2	0.0011	0.0029	0.0023	0.0704	0.0094	0.0006

	Ga	Re	Pb	Zn	Zr
ECRM 298-2	40	3	<1	6	<1

CHROMIUM - NICKEL - MOLYBDENUM ALLOYED STEEL

JK 7B - chips, NW 150 g

	C	Si	Mn	P	S	Cr	Ni	Mo	N	Cu	Al _{sol}	Al _{tot}	V
JK 7B	0.342	0.267	0.697	0.0057	0.0064	1.34	1.34	0.182	0.0050	0.021	0.010	0.014	0.004

TOOL STEEL

JK 12A - chips, NW 150 g

	C	Si	Mn	P	S	Cr	Ni	Mo	N	Cu	Co	V	W	Sn	Pb
JK 12A	0.886	0.30	0.312	0.020	0.023	4.04	0.191	4.85	0.0259	0.062	0.189	1.94	6.42	0.007	0.0004

ECRM 268-1 - chips, NW 100 g and disc, 38d x 25 mm

	C	Si	Mn	P	S	Cr	Mo	Ni	As	B	Co	Cu	N	Sn	V
ECRM 268-1	1.134	0.373	0.293	0.0209	0.0154	4.578	3.208	0.1437	0.0062	0.0009	0.0290	0.1232	2.030	0.0078	8.478

	W	Sb	Nb	Ta
ECRM 268-1	3.707	0.0017	13	2

AUSTENITIC STAINLESS STEEL

JK 27B - chips, NW 150 g and disc, 38d x 25 mm

	C	Si	Mn	P	S	Cr	Mo	Ni	B	Co	Cu	N	Sn	V	W	Ca
JK 27B	0.0089	0.401	1.510	0.0298	0.0207	17.36	2.510	12.56	0.00072	0.142	0.265	0.0630	0.0068	0.057	0.031	0.0022

	Al	Pb	Ti	Zn	Ag	As	Ga	Re	Sb	Zr
JK 27B	20	1	2	2	27	63	30	3	14	3

3. Slags, industrial fly ashes and iron ores/powders

SLAGS

ECRM 883-1 (blast furnace slag) - powder, NW 100 g

In the following table, certified and non-certified concentrations are given in W/W %.

	Fe	Si	Ca	Mg	Al	Ti	Mn	P	S	Na	K	V
ECRM 883-1	0.9820	16.67	21.32	8.86	6.55	1.3331	0.546	0.0033	1.0885	0.316	0.393	0.122

	Cr	Ni	Mo	Ba	Sr	Zr
ECRM 883-1	0.0130	0.00053	< 0.001	0.0436	0.0380	0.0276

	As	B	Be	Bi	C	Cd	Ce	Co	Cs	Cu	F	Hf	Hg	Li
ECRM 883-1	0.0001	0.0064	0.0006	0.000001	0.135	0.00002	0.014	0.00006	0.00003	0.0001	0.04	0.0008	0.000001	0.006

	Nb	Pb	Rb	Sb	Sc	Se	Ta	Te	Th	U	W	Y	Zn
ECRM 883-1	0.002	0.0001	0.001	0.000002	0.003	0.0004	0.0001	0.000003	0.008	0.001	0.00002	0.006	0.001

JK S 10 and JK S 11 - powder, NW 100 g

		F	CaF ₂	Ca _{tot}	CaO	SiO ₂	Al ₂ O ₃	FeO	MnO	MgO	TiO ₂	V ₂ O ₅	C	P	P ₂ O ₅	Cr ₂ O ₃	S
JK S 10	ESR-slag-low Al	34.4	70.7	50.8	20.3	7.8	0.54	0.10	0.03	0.30	0.05	< 100	0.022	0.002	...	...	...
JK S 11	AOD-slag	7.9	...	...	60.0	26.8	2.85	0.2	0.12	4.7	0.95	< 100	...	...	< 50	0.17	0.30

INDUSTRIAL FLY ASHES

ECRM 882-1 - powder, NW 100 g

In the following table, certified and non-certified concentrations are given in W/W %.

	Fe	Ca	Al	Na	K	Zn	Pb	Cd	Cr	Ni	Cu	V	As	Bi	Sb	Hg
ECRM 882-1	22.20	10.11	0.375	0.697	0.960	28.49	1.324	0.0183	0.490	0.0263	0.218	0.0090	0.0054	0.0026	0.0116	0.000075

	Sn	Si	Mn	Mg	Cl	C	S	F
ECRM 882-1	0.02	1.05	2	0.48	2.35	1.0	0.5	0.07

JK 43 and JK 45 - powder, NW 15 g

JK 44 - powder, NW 25 g

In the following table, certified and non-certified concentrations are given in W/W %.

	Zn	Pb	Cd	Hg	Fe	Cr	Ni	Ca	Na	K	Al	V	Cu
JK 43	4.96	0.21	0.0023	0.00039	20	8	2	12	0.5	0.3	0.2	0.02	0.2
JK 44	27.3	2.74	0.0469	0.00028	27	0.2	0.02	5	1	1.3	0.2	0.02	0.2
JK 45	1.53	0.11	0.0047	0.000025	40	0.3	0.05	7	7	0.4	0.1	0.1	0.01

IRON ORES

ECRM 688-1 (magnetite) - powder, NW 100 g

	Fe	Si	Ca	Mg	Al	Ti	Mn	P	Ni	Na	K	Co	Cu	V	Pb	Zn
ECRM 688-1	61.38	3.383	1.449	1.061	0.679	0.408	0.0457	0.337	0.0136	0.333	0.180	0.0096	0.0023	0.135	0.00025	0.0015

	As	B	Be	Ce	Cr	Ga	Gd	Hf	Hg	Ho	La	Lu	Nb	Nd	Pr	Rb	S	Sb	Sc	Se	Sm	Sn	Sr
ECRM 688-1	11	5	1	55	21.7	36	3.5	0.4	0.5	0.7	26	0.3	1.6	26	7	9	468	0.1	7	0.7	4.6	3.3	19

	Ta	Tb	Th	Tm	U	Y	Yb	Zr
ECRM 688-1	0.1	0.6	14	0.3	2	19	2	15

ECRM 689-1 - powder, NW 100 g

	Fe	Ca	Mg	Al	Ti	Mn	P	Na	K	V	Ni	Zn	Co	Cu
ECRM 689-1	57.05	1.183	0.980	1.185	0.3264	0.1196	0.0706	0.638	0.462	0.1020	0.0195	0.0042	0.0103	0.0068

	Si	S	F	Cr	C	Sn	Cl	GoI
ECRM 689-1	5	0.06	0.07	0.003	0.25	0.0003	0.015	1.5

JK 29A and JK 42A (magnetite) - powder, NW 100 g

	Fe	SiO ₂	CaO	MgO	Al ₂ O ₃	TiO ₂	MnO	P	S	Na ₂ O	K ₂ O	V ₂ O ₅	Cr	Ni	Zn	Co	Cu
JK 29A	71.36	0.33	0.082	0.223	0.232	0.292	0.0632	0.0059	0.0059	0.015	0.0087	0.266	0.0057	0.0167	0.0016	0.0106	0.0007
JK 42A	70.66	0.800	0.199	0.382	0.278	0.385	0.0506	0.0247	0.0082	0.043	0.0157	0.251	0.0010	0.0129	0.0015	0.0105	0.0007

	F	Pb	As	Sn	Cl	Ba	Gol	Zr	Ag	Au	B	Be	Bi	Cd	Ce	Cs	Ga	Ge	Hf	Hg	I
JK 29A	40	< 10	< 3	2	30	3	3.2%	2	< 0.1	< 0.1	0.4	0.1	< 0.1	< 0.1	0.7	< 0.1	41	0.7	0.1	< 0.1	< 0.1
JK 42A	117	< 10	< 3	3	100	4	3.3%	4	< 0.1	< 0.1	1	0.2	< 0.1	< 0.1	9	< 0.1	37	0.8	0.1	< 0.1	< 0.1

	Ir	La	Li	Mo	Nb	Rb	Sb	Sc	Se	Ta	Th	Tl	U	W	Y	Re	Os
JK 29A	< 0.1	3	1.4	0.8	0.3	0.3	< 0.1	1.3	< 0.2	0.1	6	< 0.1	1.1	0.2	1.0	< 0.1	< 0.1
JK 42A	< 0.1	5	1	0.3	0.8	0.6	< 0.1	2	< 0.2	0.1	11	< 0.1	2	0.1	2	< 0.1	< 0.1

JK 52 and JK 53 (Blast Furnace Pellets and Direct Reduction Pellets, respectively) - powder, NW 100 g

	Fe	Fe(II)	SiO ₂	CaO	MgO	Al ₂ O ₃	TiO ₂	MnO	Na ₂ O	K ₂ O	V ₂ O ₅	Cr	Ni	Zn	Co	Cu
JK 52	66.76	0.83	2.58	0.464	0.510	0.399	0.284	0.0485	0.0406	0.0321	0.252	0.0137	0.0172	0.0021	0.0095	0.0009
JK 53	67.82	<0.3%	0.795	0.932	0.691	0.165	0.164	0.0609	0.0406	0.0315	0.188	0.0039	0.0178	0.0021	0.0074	<0.04%

	P	S	Cl	Ag	As	B	Ba	Be	Bi	Cd	Ce	Cs	Dy	Er	Eu	F	Ga	Hf	Hg	Ho	La
JK 52	<0.01%	27	24	<0.01	0.05	<0.5	12	0.2	0.01	<0.02	7	0.08	0.3	0.2	0.1	1	33	0.7	<0.02	0.1	4
JK 53	0.0245	28	23	<0.01	0.06	<0.5	11	0.4	0.05	<0.02	13	0.03	0.8	0.6	0.2	3	20	0.8	<0.02	0.2	7

	Li	Lu	Nb	Nd	Pb	Pd	Pr	Pt	Rb	Re	Ru	Sb	Sc	Se	Sm	Sn	Sr	Ta	Tb	Te	Th
JK 52	2	0.05	0.8	3	0.9	<0.02	0.8	<0.01	1	<0.01	<0.01	0.1	1	<0.5	0.6	2	5	0.3	0.05	<0.02	6
JK 53	2	0.07	1	6	0.7	<0.02	1	<0.01	1	<0.01	<0.01	0.1	2	<0.5	0.7	1	9	0.4	0.1	<0.01	7

	Tl	Tm	U	W	Y	Yb	Zr	LOI
JK 52	<0.01	0.03	0.9	2	3	0.3	43	220
JK 53	<0.01	0.05	0.9	2	6	0.3	37	220

JK 47A - powder, NW 35 g

In the following table, certified and non-certified concentrations are given in W/W %.

	O	N	C	S
JK 47A	0.69	0.0062	0.370	0.0090

JK 55 (Direct Reduced Iron) - powder, NW 100 g

In the following table, non-certified concentrations are given in W/W %.

	Fe _{tot}	Fe _M	SiO ₂	CaO	MgO	Al ₂ O ₃	TiO ₂	MnO	P	K ₂ O	V ₂ O ₅	GOI
JK 55	92.47	84.15	1.0	1.2	0.86	0.21	0.17	0.084	0.036	0.032	0.27	36

4. Steel with special element specification

HIGH ALLOYED STEEL

JK 25 (cerium) - chips, NW 150 g

	Ce	Cr	La	Mn	Mo	Nd	Ni	Pr
JK 25	0.096	22.3	0.015	1.7	0.1	0.015	11.3	0.006

JK 36, JK 54 (carbon, sulphur, nitrogen and oxygen) - JK 36-chips, NW 150 g and JK 54-punched discs 100 pieces á 1.1 g

	C	S	N	O	H
JK 36	0.0125	0.0126	0.0337	...	...
JK 54	0.0535	0.0007	0.0229	0.0046	0.00023

JK 31, JK 32 and JK 34 (oxygen) - rods, 10 x 400-500 mm

In the following table, certified and non-certified concentrations are given in W/W %.

	O	C	Si	Mn	Cr	Ni	Al _{sol}	Al _{tot}
JK 31	0.0015	1.03	0.32	0.36	...	...	0.020	0.021
JK 32	0.0028	1.02	0.32	0.30	1.38	...	0.008	0.011
JK 34	0.0068	0.13	0.31	1.40	...	...	0.047	0.051

5. Ferro alloys 6. Flourspars

5. Ferro alloys

FERROSILICON

JK 39 - powder, NW 50 g

	C	Si	Mn	P	Fe	Ti	Cu	Al _{tot}	Ca
JK 39	0.105	75.9	0.165	0.018	21.6	0.116	0.013	1.45	0.24

	B	Mg	Cr	Ni	Co	V	As	Zn
JK 39	700	100	100	80	20	70	30	10

6. Flourspars

JK D - powder, NW 100g

In the following table, certified and non-certified concentrations are given in W/W %.

	F	CaF ₂	SiO ₂	P	S	Al ₂ O ₃	Fe ₂ O ₃	Pb
JK D	47.24	97.07	1.5	0.035	0.004	0.04	0.20	<0.001

7. Setting up standards

CERAMICS

CE 650A (high oxygen) - disc, 25d x 8 mm

In the following table are the concentrations given in W/W %.

	O	Al	C _{tot}	Ti	Fe	W
CE 650A	30	34	6	21	2.1	0.8

STEEL PLATE WITH A LAYER OF ELECTROLESS NICKEL (NIP ALLOY)

JK SUS NiP-1

This setting up standard is intended for calibration of depth profile measurements mainly by GD-OES. The layer has been applied on both sides of the steel plate. In the following table are the concentrations given in W/W %.

	P	Pb	Ni
JK SUS NiP-1	5.8 ± 0.2	0.26 ± 0.02	balance

In the following table the layer thickness is given in µm.

	Layer thickness
JK SUS NiP-1	8.7 ± 0.5

ZINC DISCS

JK SUS Zn-1, JK SUS Zn-2, JK SUS Zn-5 (zinc discs with impurities) - disc 40x40 mm, height 10 mm

In the following table are the concentrations given in µg/g.

	Ag	Al	Bi	Cd	Cr	Cu	Fe	Ga	In	Mn	Ni	Pb	Sb	Sn	Tl
JK SUS Zn-1	2	2024	0.2	14	55	14	273	0.4	...	6	43	21	0.1	0.3	8
JK SUS Zn-2	2	1394	56	75	63	19	314	0.4	...	7	43	77	34	61	5
JK SUS Zn-5	2	1992	136	63	81	15	318	19	29	9	47	108	24	99	3

Participating laboratories

Australia

CSIRO, Urrbrae

Austria

Böhler Edelstahl GmbH, Kapfenberg
Umwelt- & Betriebsanalytik, voestalpine Stahl GmbH, Linz
voestalpine Böhler Edelstahl GmbH & Co KG, Kapfenberg
voestalpine Stahl GmbH, Linz

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ArcelorMittal Gent - Stainless Steel, Gent
Belgian Nuclear Research Centre, Mol
Carsid S.A, Marcinelle
Nyrstar, Overpelt
OCAS, Zelzate
Umicore Precious Metals Refining, Hoboken

Brazil

ArceleorMittal, Tubarão
ArcelorMittal Aços Longos Brasil
CSN Mineração S.A., Congonhas
Mineração Morro do Ipê, Brumadinho
Samarco Mineração – Germano, Ouro Preto
Samarco Mineração – Ubu, Anchieta
VALE S.A. – Centro de Tecnologia de Ferrosos, Nova Lima

Canada

Corporation Scientifique Claisse, Quebec

China

Well Glow (Beijing) International Trading Ltd., Beijing

Czech Republic

TZ Chemical and Mechanical Testing Laboratories, Staré Město

Denmark

Det Danske Stålvalseværk A/S, Frederiksværk

Finland

Ab SpectroChem Oy, Turku
Oy Narema Ab, Närpiö
Ovako Oy, Imatra Stålværk, Imatra
Rautaruukki Oy, Raahe
Rautaruukki Steel, Raahe
Ruukki – Rautaruukki Steel, Raahe
SSAB Europe Oy, Raahe

France

Acieries Aubert et Duval, Les Ancizes
Arcelor Atlantique et Lorraine, Dunkerque
Arcelor Atlantique et Lorraine, Florange
Arcelor Mediterranée, Fos
Arcelor Mittal, Dunkerque
Arcelor Mittal, Florange
ArcelorMittal Imphy, Imphy
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Arcelor Mittal Maizières, Maizières
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ArcelorMittal Research, Maizières-les-Metz
ArcelorMittal Research SA, Metz
Aubert & Duval, Les Ancizes
CNRS - Service Central d'Analyse, Vernaison
CRPG, Vandoeuvre-Les-Nancy
CTIF, Charleville
CTIF, Sèvres
DCNS, Indret
Industeel, Le Creusot
Industeel France – Le Creusot, Le Creusot
Institut de Soudure, Villepinte
Naval Group Research, Bouguenais
SARM, Vandoeuvre-Les-Nancy
Sylab, Metz Cedex
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Ugine Savoie Imphy, Imphy
Ugitech Laboratoire, Ugine
Ugitech Savoie Imphy, Ugine
Ugitech, Ugine Cedex

Germany

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A.M.C.O. united samplers and assayers GmbH, Duisburg
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und Qualitätszentrum GmbH, Eisenhüttenstadt
BDG – Service GmbH, Düsseldorf
Bruker AXS GmbH, Karlsruhe
Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin
Chemad GmbH, Duisburg
Deutsche Edelstahlwerke GmbH, Witten
Edelstahl Witten-Krefeld GmbH, Witten
ELTRA GmbH, Haan
FEhS Institut für Baustoff-Forschung, Duisburg
GFE Fremat GmbH, Freiberg

H.C. Starck GmbH & Co. KG, Goslar
Heraeus Material Technology, Hanau
IFW Dresden e.V., Dresden
LECO, Berlin
Leibniz Institute for Solid State and Materials Research, Dresden
Max-Planck-Institute, Düsseldorf
MRU, Muldenhütten Recycling und Umwelttechnik GmbH, Freiberg
Recylex Harz-Metall GmbH, Goslar
Salzgitter Flachstahl GmbH, Salzgitter
TechLab, Metz
ThyssenKrupp Nirosta, Krefeld
ThyssenKrupp Steel Europe AG, Duisburg
Thyssen Krupp VDM, Werdohl
VDM Metals GmbH, Werdohl
Weser-Metall GmbH, Nordenham

Hungary

ISD Dunafer Zrt., Dunaújváros
Dunafer Labor Nonprofit Ltd., Dunaújváros

Iceland

IceTec, Reykjavik

India

Inspectorate Griffith India Pvt. Ltd., Bhubaneswar Laboratory, Bhubaneswar

Italy

Centro Sviluppo Materiali, (CSM), Rome
Cogne Acciai Speciali, Aosta

Luxembourg

Luxcontrol, Esch-sur-Alzette

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Bremanger Smelteverk, Svelgen
Saltenverk, Straummen
ELKEM-Spigerverket A/S,
Fiskaa Verk, Vaagsbygd
Molab A/S, Mo i Rana
Sintef Molab, Mo i Rana

Poland

Łukasiewicz - Instytut Metalurgii Żelaza, Gliwice

Russia

Institute of Certified Reference Materials, Yekaterinburg

South Africa

Cawood Laboratory, Saldanha Bay

Spain

ArcelorMittal-Asturias, Bilbao
Centre Nacional de Investigaciones Metalurgicas (CENIM), Madrid

Sweden

AB Bofors, Bofors
AB Sandvik Materials Technology, Sandviken
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Fundia Special Bar AB, Smedjebacken
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Ridsdale & Co. Ltd, Middlesbrough Sheffield Testing Laboratories, Sheffield
Tata Steel, Llanwern
Tata Steel, Port Talbot
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