

ECSC - CECA - EGKS

EUROPEAN COAL AND STEEL COMMUNITY

COMMUNAUTÉ EUROPÉENNE DU CHARBON ET DE L'ACIER

EUROPÄISCHE GEMEINSCHAFT FÜR KOHLE UND STAHL

EURO - STANDARD No. **376-I** SPECIAL ALLOY

CERTIFICATE OF ANALYSES

Laboratory Means (4 values)

Line No.	%C	%Si	%Mn	%S	%Ni	%Al	%Co	%Cu	%Nb	%Ti	%Ta
1	—	0.2950	—	0.0030	13.21	7.950	23.40	2.866	—	0.1480	0.0048
2	0.0223	0.2998	0.0400	0.0030	13.23	7.975	23.44	2.888	0.2800	0.1509	0.0072
3	0.0235	0.3025	0.0405	0.0032	13.26	8.000	23.45	2.893	0.2952	0.1512	0.0088
4	0.0240	0.3038	0.0426	0.0033	13.28	8.020	23.50	2.902	0.2992	0.1550	0.0100
5	0.0242	0.3062	0.0429	0.0034	13.33	8.082	23.54	2.920	0.2995	0.1600	0.0128
6	0.0245	0.3100	0.0435	0.0038	13.34	8.088	23.62	2.922	0.3000	0.1625	0.0140
7	0.0248	0.3114	0.0436	0.0038	13.37	8.090	23.67	2.934	0.3000	0.1625	0.0182
8	0.0248	0.3125	0.0441	0.0039	13.38	8.092	23.67	2.942	0.3000	0.1640	0.0184
9	0.0250	0.3125	0.0450	0.0041	13.38	8.095	23.67	2.950	0.3100	0.1675	0.0200
10	0.0250	0.3150	0.0458	0.0041	13.39	8.098	23.68	2.955	0.3112	0.1700	0.0208
11	0.0252	0.3150	0.0468	0.0042	13.39	8.100	23.71	2.955	0.3125	0.1750	0.0219
12	0.0252	0.3182	0.0470	0.0042	13.40	8.145	23.79	2.955	0.3172	0.1760	0.0220
13	0.0258	0.3195	0.0475	0.0042	13.42	8.190	23.80	2.958	0.3175	0.1825	0.0230
14	0.0260	0.3205	0.0485	0.0045	13.42	8.195	23.92	2.959	0.3180	0.1825	
15	0.0270	0.3208	0.0500	0.0047	13.42	8.198	23.94	2.970	0.3240	0.1850	
16	0.0270	0.3225	0.0501	0.0048	13.43	8.222	23.94	2.981	0.3250	0.1932	
17	0.0285	0.3230	0.0537	0.0050	13.46	8.242	23.95	3.002	0.3300	0.1984	
18	0.0288	0.3290	0.0550	—	13.49	8.304	23.99	3.030	—	0.2025	
19	0.0289	—	—	—	13.51	—	—	—	—	—	
M _M	0.0256	0.3132	0.0463	0.0040	13.37	8.116	23.70	2.943	0.3087	0.1715	0.0155
S _M	0.0018	0.0090	0.0042	0.0006	0.08	0.096	0.19	0.041	0.0132	0.0165	

M_M: Mean of the intralaboratory means.

S_M: Standard deviation of the intralaboratory means.

CERTIFIED VALUES

	%C	%Si	%Mn	%S	%Ni	%Al	%Co	%Cu	%Nb	%Ti
M _M	0.026	0.313	0.046	0.0040	13.37	8.12	23.70	2.94	0.309	0.172
S _M	0.002	0.009	0.004	0.0006	0.08	0.10	0.19	0.04	0.013	0.016

Laboratories which have participated in the standardization of Euro-Standard 376-I

Arbed, Division d'Esch Belval, Esch-sur-Alzette (Luxembourg)
 Aubert et Duval, Les Ancizes (France)
 Bohler AG, Düsseldorf - Oberkassel (Germany)
 Breda Siderurgica, Milan (Italy)
 Bundesanstalt für Materialprüfung (BAM), Berlin-Dahlem (Germany)
 Centro Sperimentale Metallurgico (CSM), Rome (Italy)
 Cockerill, Seraing (Belgium)
 Creusot Loire, Imphy (France)
 Darwins Magnets International, Sheffield (UK)
 Eclipse Tools Ltd., Sheffield (UK)

Institut de Recherches de la Sidérurgie Française (IRSID), Saint Germain-en-Laye (France)
 London and Scandinavian Metallurgical Co. Ltd., Rotherham (UK)
 Murex Ltd., Rainham (UK)
 Ridsdale and Co. Ltd., Middlesbrough (UK)
 Ross and Catherall Ltd., Sheffield (UK)
 SNIAS, Suresnes (France)
 Société Metallurgique Hainaut Sambre, Couillet (Belgium)
 Soliac, Florange (France)
 Stahlwerke Röchling - Burbach GmbH, Völklingen - Saar (Germany)
 Thyssen Edelstahlwerke AG, Krefeld (Germany)

For the Commission of Co-ordination of the Nomenclature of iron and steel products—Commission of European Communities.

For information regarding the Euro-Standards, please refer to the ECSC Information Circular No. 1 available from the Institution responsible for standardization in your country.

Pour tous renseignements sur les Euro-échantillons-types, se reporter à la Circulaire d'Information No. 1 de la CECA, diffusée par les organismes nationaux de normalisation.

Wegen Erläuterungen über Euro-Analysenkontrollproben siehe Mitteilung Nr. 1 der EGKS, zu beziehen durch die nationalen Normenorganisationen.



BUREAU OF ANALYSED SAMPLES LIMITED

Newham Hall, Middlesbrough, England. JULY, 1980

METHODS USED

ES 376-1

Element	Line Number	Method
C	2-13-15	Combustion, gravimetric
	3-4-5-7-9-10-16-17-18	Combustion, infrared absorption
	6-8-19	Combustion, conductimetric
	11	Combustion, non aqueous titration
	12	Combustion, thermal conductivity
	14	Combustion, coulometric
Si	1-4-5-6-8-9-10-11-12-13-14-15-16-17-18	Gravimetric, dehydration with perchloric acid.
	2	Gravimetric, dehydration with hydrochloric acid
	3	Atomic absorption spectrometry
	7	Photometric as molybdenum blue
Mn	2-5-6-8-9-10-13-14-17-18	Photometric, oxidation with periodate
	3-4-7-11-12-16	Atomic absorption spectrometry
	15	Photometric, oxidation with persulphate/silver nitrate
S	1-2-16	Combustion, oxidation/reduction titration
	3-5-6-7-8-9-10-11-12-13-15-17	Combustion, infrared absorption
	4	Gravimetric as BaSO ₄ after chromatographic separation on alumina
	14	Combustion, conductimetric
Ni	1-16	Dimethylglyoxime precipitation, titration with EDTA
	2-8-13-18	Photometric with dimethylglyoxime
	3-4-5-6-12-13	Dimethylglyoxime precipitation, gravimetric
	7-9-14-19	Atomic absorption spectrometry
	10	Dimethylglyoxime precipitation, titration with dichromate
	11	Photometric with dimethylglyoxime with extraction
Al	17	Dimethylglyoxime precipitation, titration with cyanide
	1-3-9	Complexometric
	2-8-10-11-12-13-14-15-18	Atomic absorption spectrometry
	4-6-7-16	Gravimetric with 8-hydroxyquinoline
	5	Gravimetric as oxide
Co	17	Photometric with eriochrome cyanine
	1	Photometric with thiocyanate
	2-6-11-14-16	Atomic absorption spectrometry
	3-7-10-12-18	Titration with ferricyanide, potentiometric end point
	4-5	Photometric with nitroso-R-salt
	8	Photometric with isonitrosomalonylguanidine
	9	Photometric with stannous chloride
	13-17	Photometric with ferricyanide
	15	Precipitation with 1-nitroso-2-naphthol, gravimetric.
Cu	1-2-4-8-9-13-14-16-17	Atomic absorption spectrometry
	3	Electrogravimetric
	5-15	Photometric with biscyclohexanone oxalyldihydrazone
	6	Photometric with cuproine
	7	Photometric with diethyldithiocarbamate
	10	Iodimetric titration after separation as sulphide
	11-12	Precipitation with salicylaldehyde, gravimetric
	18	Photometric with 2, 2' diquinolyl
Nb	2-9-12	Gravimetric after separation by hydrolysis
	3	Photometric with PAR after ion exchange separation
	4-6-11	Photometric with PAR after precipitation with phenylarsonic acid
	5	Photometric with thiocyanate after ion exchange separation
	7-8	Photometric with PAN
	10	Photometric with PAR
	13	Photometric with PAN with extraction
	14	Photometric with pyrogallol
	15-16-17	Atomic absorption spectrometry
Ti	1-8-13-15	Photometric with chromotropic acid
	2-4	Photometric with chromotropic acid after ion exchange separation
	3-9	Photometric with hydrogen peroxide after cupferron separation
	5	Photometric with diantipyrylmethane
	6-7-14-17-18	Atomic absorption spectrometry
	10-11-12-16	Photometric with hydrogen peroxide
Ta		
	1	X-ray fluorescence spectrometry
	2	Photometric with phenylfluorone after ion exchange separation
	3	Photometric with malachite green
	4	Photometric with hydrogen peroxide
	5-9-10-11-12	Photometric with pyrogallol after precipitation with phenylarsonic acid
	6	Photometric with Nile blue
	7	Photometric with PAR
	8	Photometric with methyl violet with extraction
	13	Atomic absorption spectrometry