

88355
Z/032/60/010/012/003/009
E073/E335

Development and Investigation of the Properties of the Type
CrMnN Austenitic Steel for Castings

Table 6:

	C	Mn	Si	P	S	Ni	Cr	Mo	Cu	N
Specification	max. 0.12	13.5 to 15	max. 1.0	max. 0.045	max. 0.030	1.7	16.5 to 17.5	0.3 to 0.45	0.3 to 0.5	0.20 to 0.25
20 006	0.12	14.0	1.29	0.036	0.007	1.68	17.20	0.23	0.37	0.23

There are 11 figures, 8 tables and 17 references: 8 Czech and 9 non-Czech.

ASSOCIATIONS: SVÚMT, Prague (L8b1, Šustek)
VÚHŽ, Prague (Hýbek)

Card 7/7

Z/034/61/000/001/002/021
E073/E535

AUTHORS: Löbl, Karel, Engineer and Hýbek, Karel, Engineer

TITLE: Re-smelting of Scrap CrNiMn Austenitic Steels 18

PERIODICAL: Hutnické listy, 1961, No.1, pp.13-19

TEXT: Sufficient experience is now available on the use of 18/8 type CrNi steel scrap. New problems arose in conjunction with the development of new low nickel content economy steels. As a result of efforts over many years, nickel-free austenitic steels Mn17Cr7Ti (ČSN 17481) and also Mn17Cr10V (ČSN N7 482), Mn17Cr7MoV (ČSN N7 483) have been developed. From 1957 onwards, much attention has been paid in Czechoslovakia to substituting austenitic stainless CrNi 18/8 steels by steels with a higher Mn content plus a nitrogen content, as for instance the steel Cr18Mn10Ni4N (ČSN 17460) and also type Cr16Mn15N (ČSN N7 470), which is to be introduced shortly. In both cases the manganese content is between 10 and 18%, which influences appreciably the technology of smelting charges containing such scrap. The basic consequences caused by the difference in the chemical behaviour of the individual elements are reviewed. First, a theoretical analysis is given of the phenomena taking place during the refining by means of oxygen. Particular attention
Card 1/5 ✓

Z/034/61/000/001/002/021
E073/E535

Re-smelting of Scrap CrNiMn Austenitic Steels

is paid to calculating the reaction heat. The theoretical results arrived at confirmed the practical results obtained by Pachaly (Ref.10) on processing 100% scrap of the steel Mn19Cr10Ni1.5. The slag formation was controlled in such a way as to prevent development of manganese silicates, i.e. prior to blowing oxygen the melting slag was drawn off and new, purely lime slag was prepared. Oxygen blowing was started at 1635°C and the refining proceeded at a speed of 0.02% C/min down to 0.06% C. Following that, the slag was reduced by granular Al and drawn off. The bath temperature increased to 1945°C. The Cr utilisation was 96%, that of Mn was 66%. This experimental melt is dealt with in another paper (Ref.11) but some of the relevant data are contained in Table 4. Experiments on practical methods of processing scrap of these high Mn content economy steels have been going on since 1955. Some of the data are discussed. SVUMT, jointly with the Smeral Works, Brno, started experiments in 1959 on solving the problem of using internal scrap of CrNiMn and CrMn stainless austenitic steels. Some of the results obtained in three experimental heats are described. There was particular interest in the behaviour of nitrogen. It was

Card 2/5

Z/034/61/000/001/002/021
EO73/E535

Re-smelting of Scrap CrNiMn Austenitic Steels

found that, after an initial drop, the nitrogen content remains unchanged. After evaluating the results of the first oxygen blast re-smelting of the CrNiMn steel scrap, two further melts were proceeded with in a 1-ton capacity arc furnace. The charge consisted of only 50% alloy scrap, the rest was carbon steel scrap. More intensive oxygen blowing was applied, more attention was paid to the reduction of the oxidizing slag and the high temperatures at the end of blowing in oxygen were utilised for rapid smelting of further alloying additions, primarily ferrochromium, as a result of which a quick drop in the temperature of the bath and the lining to the normal value was achieved. The results of this heat are tabulated. The following conclusions are arrived at:

1. 50 to 60% alloy scrap can be used in the charge.
 2. The smelting should be carried out in such a way that, prior to blowing in oxygen, the melt should contain 0.25 to 0.30% C.
 3. Prior to blowing oxygen, the slag should be prepared with lime in such a way as to avoid formation of manganosilicates.
 4. Blowing of oxygen should be started at the highest possible temperatures and should be continued without interruption and with
- Card 3/5

Z/034/61/000/001/002/021
E073/E535

Re-smelting of Scrap CrNiMn Austenitic Steels

the maximum permissible intensity.

5. The bath should be decarburized only to the specific upper limit of the carbon content.

6. After termination of the oxidation period, there should be a reduction of the slag which contains metal oxides and then the bath and the lining of the furnace should be cooled as quickly as possible by throwing in lump scrap or alloying additions.

7. After reduction, the slag should be drawn off as quickly as possible and the melt should be terminated in accordance with the specified requirements.

Some Czech works have already tried re-smelting of such scrap in open hearth furnaces but this was done exclusively in the manufacture of steel intended for further shaping operations. In the described experimental melts, monitoring of the temperature was not entirely satisfactory due to the lack of suitable equipment for measuring the bath temperature. Also it was not possible to weigh the metal in the slag during the process of smelting. Acknowledgments are expressed to Vl. Steffek and Engineer P. Fremunt for practical

Card 4/5

Z/034/61/000/001/002/021
E073/E535

Re-smelting of Scrap CrNiMnN Austenitic Steels

assistance and to the Director of SVÚMT, Engineer Mir. Syoboda, for his interest in the problem of introducing economy nitrogen-containing stainless austenitic steels for producing castings. There are 18 tables, 1 figure and 14 references: 6 Czech, 3 German and 5 English. ✓

ASSOCIATIONS: SVÚMT, Prague (Löbl) and VÚHŽ, Prague (Hýbek)

SUBMITTED: October 22, 1960

Card 5/5

18.1150

24114
Z/034/61/000/008/001/005
E073/E335

AUTHORS: Vyklický, Miloslav, Löbl, Karel, Kabrhel, Adolf, Tůma, Hanuš, Číhal, Vladimír and Pražák, Milan

TITLE: Influence of Molybdenum and Copper on the Properties of Stainless Chromium

PERIODICAL: Hutnické listy, 1961, No. 8, pp. 553 - 560

TEXT: According to data published in the literature (Ref. 2 - Copper in Cast Steel and Iron. Copper Development Association, London), high-alloy chromium steels containing 2-3% Si and 1.5-2% Cu have a high resistance to alum and are extensively used in the food-processing industry. An increased C content in chromium steels reduces their resistance to corrosion, particularly after unsuitable heat-treatment. However, low-carbon chromium steels cause difficulties in the manufacture of castings of complex shapes. Therefore, higher C contents are used and the unfavourable influence of the C content is compensated by adding Cu. Although the effect of Mo on chromium steels is known, the authors are not aware of any published information on the combined influence of Cu and Mo
Card 1/8

24114

Z/034/61/000/008/001/005

E073/E335

Influence of Molybdenum

on the properties of chromium steels. This is in spite of the fact that such steels are being manufactured, for instance - the Czech steel Poldi-AK1BC (chemical composition: 0.12% C, 0.50% Mn, 0.25% Si, 16.15% Cr, 0.20% Mo and 1.75% Cu) and the ferritic chromium steel for use in the chemical industry, containing 0.6-0.8% C, max. 0.7% Mn, max. 2% Si, 28.0 - 30.0% Cr, 2.0 - 2.5% Ni, 2.0 - 2.5% Mo and 2.0% Cu. The authors considered it interesting to investigate the influence of Cu and Mo on the properties of chromium steel and this paper contains the results of these investigations. A total of 11 heats was produced with chemical compositions varying between the following limits: C 0.6 - 0.11%; Cu 0 - 6.11%; Cr 14.58 - 26.6% and Mo 0 - 3.91%. The heats were produced in a 20-kg high-frequency furnace, using as a charge: low-carbon steel, low-carbon ferrochromium, low-carbon ferromolybdenum and copper. Of the mechanical properties only the hardness was measured. In agreement with data published in the literature, heats with higher copper contents showed a higher hardness, both

Card 2/8

24114

Z/034/61/000/008/001/005
E073/E335

Influence of Molybdenum

in the as-cast and in the annealed states; metallographic tests showed that addition of Cu brought about pronounced structural changes. The corrosion tests were carried out in a number of corrosive media, subdivided into the following groups:

A. Media with free SO₂

1. H₂SO₃; 2%; 20 °C
2. NaHSO₃; 5%; 20 °C

B. Organic oxides

3. lactic acid; 10%; 20 °C
4. oxalic acid; 10%; 80 °C
5. citric acid; 10%; 80 °C
6. tartaric acid; saturated solution; 80 °C
7. acetic acid; concentrated; 80 °C

Card 3/8

Influence of Molybdenum

21111
Z/034/61/000/008/001/005
E075/E335

C. Inorganic non-oxidizing acids

- 8. hydrochloric acid; 8%; 20 °C
- 9. phosphoric acid; 65%; 80 °C

D. Inorganic Oxidizing acids

- 10. nitric acid; 65%; 80 °C .

A detailed analysis allowed grouping the time dependence of the weight loss due to corrosion into three basic groups: linear dependence (in hydrochloric acid and, in some cases, also in nitric acid at 80 °C); parabolic dependence with steepness increasing with time (NaHSO₃ solution) and, finally, corrosion rate decreasing with time and characterised by a curve which flattens out. The corrosion tests have shown that steel containing 25% Cr, 2% Mo and 2% Cu had the highest resistance to corrosion, which almost equalled the Czech steel ČSN 17241. This type of steel was not investigated in the group of the 17% chromium steels. In the latter steel, Card 4/8

24114

Z/034/61/000/008/001/005
E073/E335

Influence of Molybdenum

Mo improved the resistance to corrosion in solutions with free SO₂, whilst Cu improved the resistance to corrosion in organic acids. On the basis of laboratory results, SONP Kladno produced two 50-kg heats in a high-frequency furnace with chemical compositions which proved the most favourable in the laboratory tests. The compositions of these heats (in %) were as follows:

Heat	C	Mn	Si	P	S	Cr	Mo	Cu
A 3829	0.13	0.53	0.37	0.019	0.021	15.52	2.05	2.01
B 3830	0.10	0.54	0.30	0.026	0.017	24.75	1.75	1.95 .

The ingots from both heats were forged into 250 x 600 x 20 mm blanks and then rolled down to 1 mm thick sheet. These hot-rolled sheets were then used in mechanical and corrosion tests and in weldability tests. The most favourable heat-treatment for these steels proved to be the following:

X

Card 5/8

Influence of Molybdenum

24144
Z/034/61/000/008/001/005
E073/E335

Heat A ... 800 °C/0.5 hrs/air

" B ... 900 °C/0.5 hrs/air.

The mechanical properties of thus heat-treated steels do not differ substantially from the properties of semiferritic steels containing 17% Cr (CSN 17041). After this heat-treatment, both heats proved satisfactory in double-bending tests; in Erichsen tests both heats achieved the value of 7.9 mm. Welding tests were carried out by arc-welding in an argon atmosphere; the weldability of Heat A was better than that of Heat B. Potentiostatic polarisation curves were determined to obtain information on the corrosion behaviour of the steels. The following conclusions were reached: Additions of 2% Mo and 2% Cu proved the most suitable. The resistance-to-corrosion of steels with 17% Cr, 2% Mo and 2% Cu is higher than the resistance-to-corrosion of the same type of steel without Mo and Cu. Very good results were obtained with steel containing 25% Cr and an addition of Mo and Cu which, for most corrosive

Card 6/8

Influence of Molybdenum

²⁴¹¹¹
Z/034/61/000/008/001/005
E073/E335

media, will have the same resistance-to-corrosion as the austenitic CrNi steel ČSN 17241. According to the achieved results, the steel with the lower Cr content can be used for less aggressive corrosion media and in cases in which the steel ČSN 17041 cannot be used owing to its lower resistance-to-corrosion or its poor weldability. Steel with a higher Cr content (Heat B) can be used as a substitute for the steel ČSN 17241 but the plasticity and weldability of this material are not as good as those of steel ČSN 17241.

There are 17 figures, 7 tables and 12 references: 6 Czech and 6 non-Czech. The four English-language references quoted are: Ref. 1 - Loring - Metals Handbook, pp. 462 - 465; Ref. 2 - (quoted in text); Ref. 3 - Saklatwalla - Dammler, Trans. Am. Soc. Steel. Treat. 15, 1929; Ref. 4 - Daniloff - The Alloys of Iron and Copper. New York and London, 1934.

Card 7/8

21114

Influence of Molybdenum

Z/034/61/000/008/001/005
E073/E335

ASSOCIATIONS: Státní výzkumný ústav materiálu a technologie v
Praze (State Research Institute for Materials
and Technology, Prague)
Státní výzkumný ústav ochrany materiálu
G.V. Akimova v Praze (G.V. Akimov
State Research Institute for the Protection of
Materials, Prague)

SUBMITTED: November 28, 1960

Card 8/8

18 8200

Z/032/61/011/005/008/008
E073/E335

AUTHOR: L8bl, K. et al,

TITLE: Investigation of Formed and Cast Austenitic CrNi,
Acid-resistant and Refractory Steels for the Chemical
and Power-generation Industries

PERIODICAL: Strojirenstvf, 1961, Vol. 11, No. 5, p. 396

TEXT: In the first part of the report the results are given of creep bending tests of these steels at elevated temperatures and the results of investigation of the resistance to thermal shocks and erosion. The second part deals with stainless steels of the type Cr18Ni8Mo2Cu3 and Cr21Ni18Mo3Cu4, which have good forming properties in the hot and cold states and are suitable for use in the chemical industry. The last part deals with the structural stability of CrNi refractory steels for castings, particularly with regard to differing contents of carbon and nickel. /B

Report No. SVUMT Z-60-814/I, II, III, Prague, 1960.

(Abstractor's note: this is a complete translation.)

Card 1/1

Z/046/61/000/004/005/009
D007/D102

AUTHOR: Lšbl, Karel, Engineer, Candidate of Sciences

TITLE: Cast modifications of new high-temperature steels and the current development state of new materials for castings to be operated at high temperatures

PERIODICAL: Zvářačský sborník, no. 4, 1961, 417-433

TEXT: The article describes the chemical composition, properties, and weldability of ARM cast steels developed by the SVUMT for the temperature range of 550 - 700°C. The ARM 10 - 12 steel types are modified 11%Cr stainless cast steels, suitable for temperatures of 550 - 600°C, while types ARM 1-2 and ARM 3-6 are MnCr and CrNi austenitic steels respectively, suitable for temperatures above 600°C. The ARM 10 and 11 are both CrMoV steels, the former suitable for larger, thick-walled castings, the latter (with a higher Mo content) for medium-size and small castings. The ARM 12 is a CrCoWV steel which withstands short exposures to temperatures up to 625°C, especially in the form of small castings such as turbine buckets. It is simi-

Card 1/3

Z/046/61/000/004/005/009
D007/D102

Cast modifications of new

lar to the T 59 CrWV steel, developed by the Leninovy závody (Lenin Works) in Plzeň. The ARM 1 (MnCr(Ti) 17/7) steel can be operated for longer periods at 620°C only, the ARM 2 (MnCrV 17/10) steel at 650°C. The ARM 3 (Poldi AKVSB-L) steel is structurally very stable, but less heat-resistant; the ARM 4 (similar to the Soviet LA 4 15/5 steel) withstands long-term exposure to 650°C and has a very high notch toughness. However, it contains % of the scarce Co. Efforts to save Co resulted in the development of the ARM 5 steel (similar to the Soviet TsZh 8 16/13 steel with W, Mo, and V additions, stabilized by Nb), and the ARM 6 steel which has a better heat resistance and weldability due to its higher (6%) W content. Weldability tests with CrNi steels were made according to the method developed by K.V. Lyubovskiy. It was found that Czechoslovak E 891 and E 391 electrodes produce welded joints which are sufficiently heat-resistant at operating temperatures of 625 - 650°C. However, some structural elements, especially the ferrite content, must be closely controlled. According to practical experience, the ferrite content in the first bead should range from 2 - 5% when E 391 electrodes are used. J. Koutský, V. Pilous.

Card 2/3

Cast modifications of new

Z/046/61/000/004/005/009
D007/D102

R. Pokorný and F. Richter are the personalities mentioned. There are 8 figures, 10 tables and 16 references: 13 Soviet-bloc and 3 non-Soviet-bloc. The reference to the English-language publication reads as follows:
R.H. Canghey, W.G. Benz jr., Trans. ASME A, October 1960. (Technical Editor: Doctor L. Herman of the VÚZ Bratislava).

ASSOCIATION: SVÚMT Praha (SVÚMT Prague).

Card 3/3

Z/046/61/000/004/009/009
D007/D102

AUTHORS: Vyklický, M., Engineer, and Löbl, K., Engineer

TITLE: A contribution to the weldability problem of inexpensive
chrome-nickel stainless steels with two-phase structure

PERIODICAL: Zváračský sborník, no. 4, 1961, 496-503

TEXT: This paper lists mechanical properties of Ni-saving, stabilized, stainless, austenitic-ferritic Cr21Ni5Ti and Cr21Ni5Mo2Ti steels which were developed in the USSR to replace the classical CrNi and Ti-stabilized steels used for chemical equipment etc. Since these steel types can also replace the domestic ČSN 17 246 (Poldi AKVS) and ČSN 17 347 (Poldi AKV Extra S) steels, detailed mechanical and weldability tests were made in the ČSSR. It was found that mechanical properties of these two-phase steels are strongly dependent on the Ni content, and that plastic properties improve with increasing Ni content. Compared with the classical Cr18Ni8Ti and Cr18Ni8-Mo2Ti steels, the ultimate strength and yield points are considerably higher, ductility and notch toughness are somewhat lower, and anticorrosive properties are about the same. Welding tests were made on 1-, 3-, and 20-mm

Card 1/2

Z/046/61/000/004/009/009
D007/D102

A contribution to the

sheets by the "arkatom" method (without filler material) or using E 391 electrodes, and mechanical properties of the weld metal were determined. Again, it was found that steels with higher Ni content have better ductility values, while steels with higher Mo content have somewhat lower ductilities, due to a zone of higher δ -ferrite content in the weld metal. These differences in ductility and Erichsen cupping values are most likely attributable to the total amount of austenite- and ferrite-forming elements in the heat, i. e. heats with higher contents of these additions (higher γ -phase content) also have better ductility and cupping properties. There are 2 figures, 5 tables, and 2 Soviet-bloc references. (Technical Editor: Engineer J. Zeke of the VUZ Bratislava).

ASSOCIATION: SVÚMT Praha (SVÚMT Prague).

Card 2/2

Z/032/62/012/004/006/007
E073/E355

18.1150

AUTHORS: L8bl, K. and Vyklicky, M.

TITLE: Investigation of chromium and chromium-nickel stainless steels with a low carbon content (below 0.06% C)

PERIODICAL: Strojirenství, v.12, no. 4, 1962, 317

TEXT: The report deals with the technical aspect of manufacture, particularly using acid-resistant chromium and chromium-nickel steels with low (0.06%) and very low (down to 0.05%) carbon content in the chemical and food industries. The state of development of the manufacture and research of these steels outside Czechoslovakia has been investigated and laboratory and works testing of the properties of these steels has started. Base material as well as welded material and the corrosion properties have been studied and tests were carried out on increasing the sensitivity to inter-crystalline corrosion. The test method has been developed in such a way as to permit comparison with steels having usual carbon contents. The obtained results are evaluated both

Card 1/2

Investigation of

Z/032/62/012/004/006/007
E073/E335

from the technical and economical points of view and the report lists possibilities of application of these steels in the Czechoslovak industry.

Research Report Z-61-991, SVÚMT, Prague, 1961.

[Abstracter's note: this is a complete translation.]

Jc

Card 2/2

Z/032/62/012/005/004/004
E073/E535

AUTHORS: L8bl. K. and Vyklický, M.

TITLE: Economy stainless chromium-nickel steel with a two-phase (austenitic-ferritic) structure

PERIODICAL: Strojirenství, v.12, no.5, 1962, 395

TEXT: Technical report for engineering and chemical works containing information on new types of economy stainless Cr-Ni steels with possible additions of molybdenum for increasing the resistance to corrosion in the active state. For the chemical and food industries this steel can be stabilized with titanium. These steels are intended primarily as a substitute for the scarce austenitic steels ČSN 17 246 and 17 347. They can be welded using the same technology and additional materials as for classical austenitic steels. They have a two-phase, i.e. austenitic-ferritic, structure and their yield point is "twice as high". The steels are resistant to inter-crystallite corrosion. Steels with molybdenum can be used up to 300°C and the steels without molybdenum up to 400°C. By

Card 1/2

Economy stainless chromium-nickel ... Z/032/62/012/005/004/004
E073/E535

speedy introduction of these steels it will be possible to
achieve considerable savings of nickel.

Research Report Z-61-930, SVÚMT, Prague, 1961

[Abstractor's note: Complete translation.]



Card 2/2

S/137/62/000/006/149/163
A057/A101

AUTHOR: Löbl, Karel

TITLE: Modifications of new cast heatproof steels and the modern state in development of ingots, intended for the work at high temperatures

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 6, 1962, 4 - 5, abstract 6E27 ("Zvárač. sb.", 1961, v. 10, no. 4, 417 - 433, Czechoslovakian; Russian, German and English summaries)

TEXT: In the State Research Institute for Materials and Technology in Prague 3 types of stainless steels were developed with 11% Cr, modified with carbide-forming elements to increase the resistance to heat, for works at temperatures of 550 - 600°C. The new Cr-Mo-V-steels were named ARM 10 and ARM 11, and the Cr-Co-W-V-steel ARM 12. Steel ARM 10 is suitable for large ingots, while steel ARM 11 is used for medium and small ingots. Steel ARM 12 contains deficient Co. Similar steels were developed in the Plants V. I. Lenin in Plzen in form of steel with 12% Cr and increased content of W. Among these is steel, named T 59 L, suitable for large ingots. For temperatures above 600°C the mentioned steels are not convenient, and have to be replaced by austenitic steels. Wide-spread use

Card 1/2

Modifications of new...

S/137/62/000/006/149/163
A057/A101

have in Czechoslovakia austenitic Mn-Cr-steels for ingots, named ARM 1 (17/7 MnCrTi) or ARM 2 (17/10 MnCrV) and 4 types of austenitic Cr-Ni-steels (from ARM 3 to ARM 6). Concerning the resistance to heat steel ARM 2 is convenient up to 650°C, and steel ARM 1 only until 620°C. To the austenitic Cr-Ni-steels ARM-ARM 6 belong steel Poldi AKVSEL (ARM 3), the Soviet steel LA 4 of the type 15/15 with 3% Co (ARM 4), the Soviet steel CZ (CZh) 8 of the type 16/13 with W, Mo, V (ARM 5) and its modification with increased content of W up to 6% (ARM 6). Satisfactory heatproof properties have steels ARM 4 and ARM 6, but steel ARM 4 has to be used preferably when an increased a_k is needed. The advantage of steel ARM 6 is the absence of deficient Co and good weldability. ✓

V. Tarisova

[Abstracter's note: Complete translation]

Card 2/2

S/137/62/000/006/152/163
A057/A101

AUTHORS: Vyklický, M., Löbl, K

TITLE: On the question of the weldability of economical chromium-nickel stainless steels with a two-phase structure

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 6, 1962, 5, abstract 6E32 ("Zvárač. sb.", 1961, v. 10, no. 4, 496 - 503, Czechoslovakian; Russian, German and English summaries)

TEXT: Results of mechanical tests of welded samples of steel Cr21 Ni5 Ti and Cr21 Ni5 Mo2, developed as substitutes of classical Cr-Ni-steels of the type 18-8, stabilized with Ti, are presented. See EI SVP, 1962, no. 14, ref. 57.

Ye. Greyl'

[Abstracter's note: Complete translation]

Card 1/1

LOBL, Karel, inz., C.Sc.

International Symposium on Stainless Steel and Alloys in Prague.
Zvaranie 10 no.12:378 D '61.

S/137/62/000/008/057/065
A006/A101

AUTHORS: Löbl, Karel, Váša, Čestmír

TITLE: Fe-Cr-Ni alloys with a strengthening σ -phase for the hardfacing of sealing reinforcement surfaces

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 8, 1962, 12, abstract 8E68 ("Materiál.sb. 1960, Čast. 2", Statní výzkumný ústav materiálu a technol. Praha, 1960, 125 - 135, Czech; summaries in Russian and English)

TEXT: The authors present a short review of literature on hardfacing materials which do not contain Co and which, after additional heat treatment, single out a strengthening σ -phase. Experiments of the Czechoslovak Institute of Materials and Techniques on the development of such an alloy for arc hardfacing are discussed. Austenite-forming C, N, Ni counteract the separation of the σ -phase (Mn dissolves considerably in the σ -phase), ferrite-forming Si, and, to a lesser degree, Mo, Ti and Nb, promote its separation. Some variants of hardfaced type X 40 H 10 (Kh40N10) and X 30 H 10 (Kh30N10) metal are investigated, as



Card 1/2

Fe-Cr-Ni alloys with a...

S/137/62/000/008/057/065
A006/A101

to hardness and microstructure, after various types of heat treatment. Mutual galling in friction was also studied. On the basis of experiments, three experimental electrode types were developed yielding the following composition of the built-up metal: (in %) grade 598 - C 0.38, Mn 3.1, Si 0.7, Cr 17.1, Ni 7.4; grade 560 - C 0.3, Mn 1.0, Si 1.3, Cr 26.9, Ni 10.0, Nb/Ta 0.8, and grade 888 - C 0.09, Mn 1.0, Si 5.0, Cr 17.0, Ni 7.9. The Institute in cooperation with the "Moravskoslezská armaturka" Plant carried out the hardfacing of some sets of sealing parts for steam valves. The hardfaced valves operated satisfactorily during tests on a high-pressure stand at 500°C and under particularly difficult conditions. They have now been trial-operating for several months at one of the Ostrava electric plants. ✓

Ye. Greyl'

[Abstracter's note: Complete translation]

Card 2/2

LOBL, Karel, inž., kandidát technických vod; LEHKY, Zdeněk, inž.

Welding of stainless austenitic nitrogen alloyed steels.
Zvar sbor 9 no.4:445-461 '60

1. Státní výzkumný ústav materiálu a technologie, Praha;
Železárny Antonína Zapotockého, Vamberk.

Z/056/62/019/008/001/007
1037/1237

AUTHORS: Löbl, K., and Váša, C.

PERIODICAL: Přehled technické a hospodářské literatury. Hutnictví a strojírenství v. 19, no. 8, 466 abstract HS62-5921 (1960 Praha: SVÚMT, STK 129029)

TITLE: Economical non-rusting steels for casts of the type Cr—Ni—Mn—N and Cr—Mn—N

TEXT: Study of the additives Mo and Cu to the mechanical properties and corrosion resistance of the steels mentioned for the casts. It was found that addition of Mo, Cu or both (up to 2%) does not lower the essential mechanical qualities of the steels investigated and in some cases it improves their resistance to corrosion. Possibilities for use of the tested materials. 12 microphotos, 14 diagrams, 3 tables, 17 references. From the collection (p. 103-124). Material collection 1960, Part II: Glow-proof, glow-resistant, and corrosion resistant steels and alloys.

[Abstracter's note: Complete translation.]

Card 1/1

S/137/62/000/010/013/028
A052/A101

AUTHORS: Löbl, Karel, Potůček, Bedřich, Vystyd, Miloš, Hýbek, Karel

TITLE: Austenitic heat-resisting stainless steel for castings

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 10, 1962, 77, abstract
10I499 P (Czech. pat., no. 99833, June 15, 1961)

TEXT: The patent presents an austenitic steel containing (in %): 0.20 - 0.75 C, ≤ 3 Si, 6 - 16 Mn, 16 - 32 Cr, ≤ 3 Ni, 0.2 - 6 Mo, 0.15 - 0.75 N and also ≤ 0.05 B and ≤ 20 Co. The presence of B and Co contributes to heat resistance. These steels are characterized by a high heat and corrosion resistance and can be used for work at up to 1,000°C and in an atmosphere containing C and S.

V. Srednogorska

[Abstracter's note: Complete translation]

Card 1/1

S/137/62/000/009/020/033
A006/A101

AUTHORS: Löbl, Karel, Potůček, Bedřich, Šustek, Alois

TITLE: Stainless austenitic steel for castings

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 9, 1962, 78, abstract
9I480 P (Czechosl. Patent no. 100061, of July 15, 1961)

TEXT: To replace the widely used austenitic stainless Cr-Ni steel (9% Ni, 18% Cr), an austenitic steel is proposed which does not contain Ni at all or only small amounts of it. The chemical composition of the steel (in %) is: C 0.05 - 0.3, Si \leq 1.5, Mn 10 - 20, Cr 14 - 22, N 0.15 - 0.45, Cu 0.10 - 3.0. The corrosion resistance of the steel can be raised by addition of 3.5% Ni or 0.10 - 5.0% Mo (or by joint addition of Ni and Mo). The mechanical properties are improved by addition of B or Zr in a 0.05% amount, or by their simultaneous addition in a quantity of up to 0.10%. The steel structure should not contain > 25% of the ferritic component. The production of this steel has an economical advantage, since its use makes it possible to reduce the weight of the castings (due to improved mechanical properties) and their Ni content. Moreover, the wide-ranged

Card 1/2

Stainless austenitic steel for castings

S/137/62/000/009/020/033
A006/A101

chemical composition of the steel permits the use of mixed alloy-steel wastes for melting. The authors point to the positive results of tests made with parts of steel containing (in %): C 0.16, Si 0.67, Mn 17.23, Cr 17.04, Ni 0.22, Mo 0.42, Cu 0.48, N 0.34, P 0.017, S 0.012 - in HNO_3 at its low concentration and temperature, and also in the production of citric acid.

G. Rymashevskiy

[Abstracter's note: Complete translation]

Card 2/2

S/137/62/000/009/021/033
A006/A101

AUTHORS: Löbl, Karel, Vystyd, Miloš

TITLE: Heat resistant stabilized welding steel for castings

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 9, 1962, 78, abstract
9I482 P (Czech. Patent no. 101050, of September 15, 1961)

TEXT: A composition of heat resistant steel for casting is proposed which does not contain Co and is distinguished by high structural stability and good weldability. The steel contains in %: C 0.06 - 0.25, S₁ ≤ 1.2, Mn ≤ 3.2, Cr 14 - 20, Ni 12 - 20, P ≤ 0.1, S ≤ 0.1, (W+Mo+Nb+V) 4 - 10 in a proportion of (5+3):(3+1.5):(1+0.5):(0.51+0.5). Some Nb portion may be replaced by Ta; the Ti content may be 0.1 - 0.4%. The steel may contain N up to 0.25%, B up to 0.1% or Zr up to 0.4%.

M. Shapiro

[Abstracter's note: Complete translation]

Card 1/1

S/123/62/000/024/002/005
A006/A101

AUTHORS: Löbl, Karel, Váša, Čestmir

TITLE: Alloys of the Fe-Cr-Ni system with a σ -phase, used for building-up sealing surfaces of fixtures

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 24, 1962, 14, abstract 24A89 ("Materiál sb. 1960, Čast 2". Statní výzkumný ústav materiálu a technol. Praha, 1960, 125 - 135, Czech; summaries in Russian and English)

TEXT: The authors suggest the use of Fe-Cr-Ni system alloy (18 - 28% Cr; 7 - 10% Ni) as building-up material for fixtures operating at 400 - 500°C. The high hardness of the alloy is assured by the singling out of the σ -phase at heating up to 700°C.

[Abstracter's note: Complete translation]

Card 1/1

S/137/62/000/011/031/045
A006/A101

AUTHORS: Horváth, Stefan, Muncner, Ladislav, Lobl, Karel

TITLE: Wear-resistant iron-chrome-nickel base alloy

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 11, 1962, 86,
abstract 111570 (Czechoslovakian Patent no: 101244 of October 15,
1961)

TEXT: A Fe-Cr-Ni-base alloy is proposed with admixtures of Si, Mn and Mo. It is intended to be welded onto sealing surfaces of fixtures for high-power medium-and-high-pressure pumps used in the cement production, and for parts used at high temperatures in the metallurgical industry, etc. The alloy is wear-resistant. Its strengthening proceeds as a result of singling out a σ -phase during annealing. The chemical composition of the alloy is in %: C 0.05 - 1.0 Mn 0.20 - 6.0 Si 1.2 - 9.0 Ni 4.0 - 15.0 Cr 24 - 40 Mo 0.2 - 5.0 the rest Fe. Additional strengthening of the alloy may be attained by introducing up to 2.0% V, up to 2.0% W, up to 1.5% Nb and Ta or up to 2.0% Co. % Si/% C ratio > 6 and % Si/% Mo ratio > 0.5 are recommended. Particularly good results were obtained with an

Card 1/2

Wear-resistant iron-chrome-nickel base alloy

S/137/62/000/011/031/045
A006/A101

alloy containing in %: C 0.10 - 0.20 Mn up to 1.0 Si 2.0 - 3.0 Cr 34.0 - 38.0 Ni 9.0 - 13.0 and Mo 0.5 - 2.0. H_v of the alloy in its initial state is 350, after 3 hour annealing at 700°C H_v is 840 and 820 after 50 hour annealing at 800°C. Additional increase in hardness of the alloy can be obtained by adding separately or in combinations up to 2.0% V, up to 2.0% W, up to 1.5% Nb and Ta and up to 2.0% Co. The highest strength of the alloy is obtained by introducing V separately, rather than in combination with W, Co or Nb. Addition of P as high as 1.0% improves the machinability of the alloy. The authors describe a method of welding the alloy onto parts and its advantages over wear resistant Co-Cr-W base alloys used at present.

V. Chernyy

[Abstracter's note: Complete translation]

Card 2/2

S/137/62/000/012/045/085
A006/A101

AUTHORS: Lbbl, Karel, Zezulová, Marcela, Šustek, Alois, Potůček, Bedřich,
Stefek, Vladislav, Chatrný, Drahomír, Pant, Pavel

TITLE: Austenite stainless (dispersion) hardening steel for castings

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 12, 1962, 75,
abstract 12I450P (Czechosl. Patent no. 100589 of August 15,
1961)

TEXT: A steel is proposed which contains in %: C 0.05 - 0.40; Si > 1.5;
Mn 0.5 - 6.0; Cr 14 - 20, N 0.01 - 0.25, Ni 2.5 - 5.5. The corrosion resistance
of the steel increases by the addition of 0.10 - 3.0% Cu. Steel containing
0.10 - 5% Mo has a raised corrosion resistance in H₂SO₄.

V. Srednegorska

[Abstracter's note: Complete translation]

Card 1/1

Z/020/63/000/001/003/005
D006/D102

AUTHORS: Löbl, K., Vyklický, M., Kabrhel, A., and Šustek, A.

TITLE: Research on economical stainless austenitic-ferritic steels for service in the chemical industry

PERIODICAL: Energetika, no. 1, 1963, 54

TEXT: The paper is concerned with the problem of nickel saving in austenitic chrome-nickel steels used for production of welded machine equipment for the chemical industry. Using Soviet sources and results of own research, a total of four economical steels was developed in which nickel content was reduced practically to one half compared with the scarce steels they are to replace. The economical chrome-nickel austenitic-ferritic steels can replace the classic austenitic steels in most applications except for cases involving corrosive or active environments. Also, in designing machine equipment advantage can be taken of their better mechanical properties, especially higher yield point, as compared with the currently required chrome-nickel austenitic steels. Abstracter's note: This is a complete translation of an abstract from the Vyzkumna zprava SVUMT (SVUMT Research Report) no. Z-61-1003, Prague, 1961. ✓
Card 1/1

LOBL, Karel, inz., kandidat technických ved; PÍLOUS, Vaclav, inz.

Welding thick-walled austenitic castings for the power industry.
Zvar sbor 10 no.2:169-185 '61.

1. Statni vyzkumny ustav materialu a technologie, Praha;
Vyzkumny a zkusebni ustav, Leninovy zavody Plzen.

LOBL, Karel, inz., ScG.

Modified casting of new heat-resisting steel, and recent development of the new materials for high-temperature castings. Zvar sbor 10 no.4:417-433 '61.

1. Statni vyzkumny ustav materialu a technologie, Praha.

VYKLICKY, M., INZ.; LOBL, K., inz.

Problem of weldability of economical Ni-Cr rustproof steel with two-phase structure. Zvar sbor 10 no.4:496-503 '61.

1. Statni vyzkumny ustav materialu a technologie, Praha.

ZABOKRTSKY, Miroslav; LOBL, Karel

Material properties of hardfaced spindles of fittings for
supercritical parameters. Zvaranie 12 no.4:85-89 Ap '63.

1. Statni vyzkumny ustav materialu a technologie, Praha.

VYKLICKY, Miloslav; LOBL, Karel; KABRHEL, Adolf; TUMA, Hanus; CIHAL,
Vladimir; PRAZAK, Milan

Effect of molybdenum and copper on the properties of chrome
stainless steel. Hut listy 16 no.8:553-560 Ag '61.

1. Statni vyzkumny ustav materialu a technologie, Praha (for
Vyklicky, Lobl, Kabrhel and Tuma). 2. Statni vyzkumny ustav
ochrany materialu G.V.Akimova, Praha (for Cihal and Prazak).

SUSTEK, Alois; LOBL, Karel

Founding properties of stainless steels with reduced nickel content. Slevarenství 11 no.11:468-471 N°63.

1. Statni vyakumny ustav materialy a technologie, Praha.

BIZEK, Vaclav, inz.; LOBL, Karel, inz., CSc.

Some problems of the weldability of Cr18Ni5Mn8N and Cr18Mn15N
austenitic stainless steels. Zvaranie 12 no.10:284-287 0 '63.

1. Statni vyzkumny ustav materialu a technologie, Praha.

VRBIK, Vl.; DRAPAL, S.; KRAUS, Vl.; LOBL, K.; VYKLICKY, M.; KABRHEL, A.;
SUSTEK, A.; SLABA, J.; STETINA, K.; SCHREIBER, B.; PRUDKY, J.

Information on the reports of the State Research Institute of
Material and Technology. Energetika Cz 13 no.1:53-54 Ja '63.

Z/032/63/013/002/004/004
E073/E335

AUTHORS: Vyklický, M., Löbl, K., Potůček, B. and Kabrhel, A.

TITLE: Introduction of economy stainless refractory steels
and facing elements

PERIODICAL: Strojírnoství, v. 13, no. 2, 1963, 155

TEXT: The possibility was examined of substituting expensive and scarce steels by economy steels of the type Cr18Ni5Mn9N and Cr18Mn15N and satisfactory progress was made in introducing the proposed alloys as substitutes for the steels Real 095 and 096. Furthermore, the possibility was considered of using the steel Cr18Mn15N for a number of corrosive media under current welding conditions. Work has progressed in obtaining more accurate data on the properties of the oxidation-resistant austenitic chromium-nickel steels used for casting components of fittings, turbines, etc. Draft data sheets were worked out for the steels ARM4 and ARM 6.

Report Z-61-987, SVÚMT, Prague, 1961.

[Abstracter's note: complete translation.]

Card 1/1

Z/032/63/013/004/011/011
E073/E535

AUTHOR: L8b1 K.

TITLE: Checking on the possibility of using ARM 10 steels
for castings of gas-turbine components

PERIODICAL: Strojirenství, v.13, no.4, 1963, 316

TEXT: Laboratory development of 12% Cr-base steel, brand
ARM 10, intended primarily for cast components of gas turbines.
Tests on the mechanical properties, structural stability,
resistance to thermal shocks, high-temperature strength and
weldability. Draft of a data sheet and instructions on the
manufacturing technology.
Report Z-62-1134, SVÚNT, Prague, 1962.

[Abstracter's note: complete translation]

Card 1/1

LOBL, K.

Checking the possibility of using ARM 10 steel for casting gas turbine parts. Energetika Cz 13 no.7:386 J1 '63.

LOBL, K.; VYKLICKY, M.; KABRHEL, A.;

Introduction of new stainless, fireproof, and fire-resisting
steels and alloys in industrial production. Energetica Cz
13 no.8:440 Ag '63.

VYKLICKY, M.; LOBL, K.; POTUCEK, B.

Industrial use of economical stainless refractory steels and alloys.
Energetika Cz 13 no.9:500 S '63.

ACCESSION NR: AP4034555

Z/0065/64/000/002/0138/0152

AUTHOR: Lobl, Karel, (Lebl, Karel); Tuma, Hamus (Tuma, Garush)

TITLE: Precipitation and solution of carbide $M_{23}C_6$ in type 18/9 low-carbon austenitic steels

SOURCE: Kovove materialy, no. 2, 1964, 138-152

TOPIC TAGS: low-carbon austenitic steel, carbide precipitation, activation energy, nucleation area, diffusion growth, isothermic roasting, plasticity retention, kinetic property, thermodynamic property

ABSTRACT: The advantages of low-carbon steel may be offset by the choice of wrong production methods and by keeping it too long at critical temperatures for the precipitation of carbides. The paper discusses the kinetics of precipitation of chromium carbide in two 40 kg batches of steel of type Cr18Ni9 (0.058% and 0.036% C), fairly stable toward phase sigma, when roasted isothermically for a long time at 400--1,000 C, and studies their behavior by direct electrolytic isolation in an alcoholic 5% hydrochloric-acid solution

Card 1/3

ACCESSION NR: AP4034555

and chemical analysis of the carbides. Special attention was paid to the processes in the areas of nucleation (up to 650C) and diffusion growth (650--760/770C) of these carbides and above 760 and 770C, respectively, where carbide $M_{23}C_6$ was partially soluble in the two batches, taken from ordinary production in a basic induction furnace. The activation energy of the carbide reaction was found to be 32,000--38,000 cal/mol in the area of highest solubility; over 70,000 cal/mol in the area of pronounced diffusion growth; around 5,000 cal/mol in the nucleation area. The average chemical composition of $M_{23}C_6$ is $Cr_{19.8} Fe_{3.2} C_6$ for the state of equilibrium. In the nucleation area the precipitated carbide was substantially richer in iron, whereas in the diffusion-growth area the iron content declined due to the increased rate of diffusion of the chromium. The distribution of total carbon between austenite and carbides depends upon the carbon content above 770C; below this temperature, not only on the carbon content, but also on the time of isothermal roasting. The mechanical experiments with samples subjected

Card 2/3

ACCESSION NR: Af 4034555

to isothermic strain for up to 10,000 hours showed that 18/9-type chromium steels with reduced carbon content retain considerable plasticity even after long roasting. The results of electrolytic isolation of the carbide phases are helpful in studying the kinetic and thermodynamic properties of carbide reactions. Orig. art. has: 10 figures and 4 tables.

ASSOCIATION: Statni vyzkumny ustav materialu a technologie, Prague
(State Research Institute for Material and Technology)

SUBMITTED: 12Sep63

DATE ACQ: 11May64

ENCL: 00

SUB CODE: MM

NO REF SOV: 004

OTHER: 005

Card 3/3

ACCESSION NR: AP4012493

Z/0034/64/000/002/0147/0147

AUTHOR: Vyklicky, M. (Engineer); Lobl, K. (Engineer); Kopal, V. (Engineer)

TITLE: Stainless austenitic-ferrite steel

SOURCE: Hutnicke listy, no. 2, 1964, 147

TOPIC TAGS: austenitic-ferritic steel, intercrystal corrosion, corrosion-resistant steel

ABSTRACT: The object of the invention is the forming and casting of austenitic-ferritic steels resistant to inter-crystal corrosion. These steels contain from 30 to 50 percent ferrite, the remainder is austenite and type $M_{23}C_6$ carbide. The ferrite contains from 22.5 to 25% chrome, and from 3 to 5% nickel, and the austenite contains from 19.5 to 22.5% chrome and from 5 to 8% nickel, with a total content of carbon in the alloy of up to .25%, a silicon content up to 1%, a 6% manganese content by weight, and with the usual content of inclusions.

A close study of the properties of steel with two-phase austenitic-ferritic structure, either stabilized (about 0.5% titanium) or non-stabilized, was con-

Card 1/8*

ACCESSION NR: AP4012493

ducted with material having a carbon content of about 0.1%, a silicon content of about 0.5%, manganese, about 0.5%, chrome, about 20%, and nickel, about 4%. In some cases, these were alloyed with about 2% molybdenum. With heat treatment at 1,050°C air temperature, the following average mechanical properties of steel were determined:

Type of Steel	σ_{Kt} kp/mm ²	σ_{Pt} kp/mm ²	10 %	R mkg/cm ²
Cr20Ni4	41.8	85.8	37.5	13.2
Cr20Ni4Ti	49.7	78.0	30.8	8.6
Cr20Ni4Mo2	47.6	72.0	43.1	14.2
Cr20Ni4Mo2Ti	54.1	60.1	18.5	3.6

The nonstabilized steels have considerably better plastic properties than any stabilized steel alloyed in the same way.

ASSOCIATION: None

Card

2/82

LOBL, Karel; LICHÁ, Leopold; ABUSINOV, Alexandr

Founding properties of acid resistant alloys based on nickel.
Slevarensvi 12 no.6:228-230 Je '64.

1. State Research Institute of Materials and Technology,
Prague.

LOBL, Karel, inz., CSc.

Problem of the structure and chemical composition of weld-on alloys for service at the temperature 700 °C. Zvaranie 13 no. 1: 3-10 Ja '64.

1. Statni vyzkumny ustav materialu a technologie, Praha.

ZABOKRTSKY, Miroslav; LOBL, Karel, inz. CSc.

Surfacing of sealing strips on fittings from 17,027.6 stainless steel. Zvaranie 13 no. 4:97-103 Ap '64.

1. State Research Institute of Material and Technology, Prague.

LOBL, Karel, inz. CSc.; ABUSINOV, A., inz.

Welding of acidproof alloys based on nickel. Zvaranie 13
no.5/6:146-151 My-Je '64.

1. State Research Institute of Materials and Technology,
Prague.

LOBL, K.

Development of the Czechoslovak prototypes of closing and protective fittings for very high steam parameters and the tests of their properties. Energetika Cz 14 no. 3: 147 Mr '64.

LOBL, Karel

A quarter century of the Protok granulator. Listy cukrovar 20
no. 6:164-166 Je '64.

L 14032-65 EWA(d)/EWP(t)/EWP(b) ASD(m)-3 MJW/JD/WB/MLK

ACCESSION NR: AP4044396

Z/0065/64/000/004/0384/0396

AUTHOR: Lebl, Karel (Lebl, Karel); Rysava, Marie (Ry*shava, Mariya; Tuma, Hanus (Tuma, Genush)

TITLE: Effect of heat treatment on the resistance of stabilized austenitic chromium-nickel steels to intergranular corrosion *fi* *Ex*

SOURCE: Kovove materialy, no. 4, 1964, 384-396

TOPIC TAGS: intergranular corrosion, chromium nickel steel corrosion, austenitic steel, intergranular corrosion, titanium stabilized austenitic steel, niobium stabilized austenitic steel, steel intergranular corrosion *27*

ABSTRACT: Three austenitic chromium-nickel steels were investigated for susceptibility to intergranular corrosion. The steels investigated were titanium-stabilized CSN 17 246 steel (0.10% C, 17.40% Cr, 9.57% Ni, 0.57% Ti), niobium-stabilized CSN N7 247 steel (0.07% C, 18.4% Cr, 11.49% Ni, 0.79% Nb and 0.08% Ta), and low-carbon AKV8 steel (0.058% C, 17.70% Cr and 9.25% Ni). The results showed that all the steels tested were more or less susceptible to intergranular corrosion and

Card 1/2

L 14033-65
ACCESSION NR: AP4044396

especially susceptible when solution heat treated at temperatures above 1050C. The 17 246 steel when annealed at 1300 or 1400C and then held for 20 or 1 min, respectively, at 700C became susceptible to intergranular corrosion. The N7247 and AKV8 steels showed somewhat better behavior. In titanium-stabilized steel a complex carbide, possibly (Ti, Fe, Ce) (C, N), is formed at high annealing temperatures. During the subsequent sensitizing treatment at 700-800C, it decomposes, resulting in concentration gradients. In this condition the steel becomes susceptible to intergranular corrosion. However, with prolonged sensitizing treatment, the concentration gradients are leveled out and a polyhedral carbide Ti(C, N) is formed; in its presence the susceptibility to intergranular corrosion decreases. More or less similar effects are expected to occur in niobium-stabilized steels. Generally, low-carbon steel appears to be the least susceptible to intergranular corrosion. Orig. art. has: 11 figures and 3 tables.

ASSOCIATION: SVUMT, Prague

SUBMITTED: 27Feb64

ENCL: 00

SUB CODE: MM

NO REF SOV: 001
Card 2/2

OTHER: 016

L 62743-65 EWA(c)/EWP(t)/EWP(z)/EWP(b) JD, TN
ACCESSION NR: AP5021407

CZ/0034/64/000/012/0870/0874

AUTHOR: Lobl, Karel; Tuma, Hanus; Grobner, Pavel

26
24
-
6

TITLE: Contribution to the kinetics of segregation of carbides in austenitic steels of the type 18 Cr, 9 Ni, Ti

SOURCE: Hutnicke listy, ¹⁹⁻no. 12, 1964, 870-874

TOPIC TAGS: crystallization, carbide, electrochemical analysis, alloy steel, high alloy steel, austenitic steel

Abstract ^{52/18} [Authors' English summary]: Kinetics of the crystallization of carbides was investigated by the method of electrochemical isolation and chemical analysis of the isolated portion of samples isothermally annealed at 400-1000°C for 20-100 hours. Segregation of Ti carbides proceeds, according to the literature, through nucleation, diffusional growth, and increased availability. The amount of Ti(C,N) eliminated is proportional to the activation energy of this separation. It is a function of the amount of Ti in

Card 1/2

L 62743-65

ACCESSION NR: AP5021407

2

the steel (4-8 kcal/mol at 0.21% to 8-15 at 0.61% Ti). Decrease of the amount of Ti, Cr, Fe in carbides occurs at 400-650°C at quick isothermal annealing. This follows an unstable course during at 400°C; even in a high alloy steel with excess of Ti, which reprecipitates occurred at 400-650°C during long term annealing. It is probably the fact that up to 10⁻³ or 10⁻⁴ the coefficient in austenitic steels is higher than that of Ti.

Orig. art. has: 12 graphs, 1 table.

ASSOCIATION: SVUMT, Prague

SUBMITTED: 00

ENCL. 0

DATE: 05-71

NR REF SOV: 001

OTHER: 004

JPRS

Cord 2/2 *gik*

1247-01 EWP(w), EPP(s) 144 3 1 EAP(t) EWP(z) EWP(s) JD HW JG/WB
ACCESSION NR. APS017234

Author: Vyklicky, M. (Engineer), Gail, K. (Engineer), Krejci, R. (Engineer) 7

TITLE: Cast stainless chromium-nickel steel.

SOURCE: Hutnicke listy, no. 7, 1965, 528

TOPIC TAGS: steel, cast steel, stainless steel, chromium nickel steel, stainless chromium nickel steel, cast chromium nickel steel, cast stainless chromium nickel steel

ABSTRACT: This Author Certificate introduces a cast stainless chromium-nickel steel containing 0.12% C, 4.0% Mn, up to 1.5% Si, 18-24% Cr, 15-22% Ni, 2.0-4.0% Mo, up to 0.1% N, up to 0.01% S, and up to 0.01% P. In presence of 1.0-1.5% Cu, up to 0.1% N, up to 0.01% S, and up to 0.01% P. As increased ferrite should be maintained, and the w... R-16, and... makes the steel corrosion resistant in the austenitic state. The steel... ferrite, which increases tensile and yield strength and weldability, and... susceptibility to weld cracking. Vacuum refine the cast structure... of the steel.

Card 1/2

L 57437-65

ACCESSION NR: AP5017234

0

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: M4

REF ID: 000

OTHER: 000

ATT PRESS: 4041

5/18 2/2

L 23188-66 EWP(w)/EWA(d)/T/EWP(t) IJP(c) JD/HW

ACC NR: AP6008073

SOURCE CODE: CZ/0065/66/000/001/0064/0073

AUTHOR: Tuma, Hanus--Tuma, Ganush; Rysava, Marie--Ryshava, Mariye; Lobl, Karel-- 58

Lebl, Karel

ORG: SVUM, Prague

TITLE: Contribution to the study of fracture surfaces on stainless steels of the type Cr18Ni9Ti 14 B

SOURCE: Kovove materialy, no. 1, 1966, 64-73

TOPIC TAGS: stainless steel, annealing, carbide, corrosion, steel, material fracture, electron microscopy/Cr18Ni9Ti steel

ABSTRACT: The paper describes some results of an investigation of the fracture surfaces of type Cr18Ni9Ti steels performed by the electron microscopy method. In the process, polarization curves in different electrolytes were determined, and the chemical composition of the fracture surfaces was estimated. The differences in morphology as well as in the rate of precipitation of the M₂₃C₆ carbides on the boundaries of grains were identified. While the carbides were precipitated after 5 minutes of annealing at 750C on the boundaries $\gamma - \delta$, intensive precipitations took place only after one hour of annealing on the boundaries $\gamma - \gamma$. This corresponded to the state when the material develops a tendency to intergranular corrosion. Selective dissolution of areas tending toward this corrosion can be attained in a 5 per cent formic acid electrolyte. The original amount of 18 per cent Cr was found reduced to 10 per cent in the region of fracture. A small increase in nickel

Card 1/2

L 23188-66

ACC NR: AP6008073

content was observed which, however, cannot prevent the starting of corrosion.
The results of investigation are in accordance with the Rollason's curve for the steel investigated, and confirm the theory that the tendency to intergranular corrosion of Cr18Ni9Ti steels is caused by the lowering of Cr content in the regions of grain boundaries after precipitation of $M_{23}C_6$ carbides. Orig. art. has: 13 figures, and 1 table. [Based on Authors' abstract.]

SUB CODE: 11/ SUBM DATE: 27Apr65/ ORIG REF: 004/ OTH REF: 001/ SOV REF: 001/

Card 2/2

L 31943-66 EWA(d)/ENP(t)/ETI IJP(c) JD/WB

ACC NR: AP6019420 (A) SOURCE CODE: CZ/0078/66/000/005/0017/0017

INVENTOR: Lobl, K. (Engineer; Prague); Zezulova, M. (Candidate of sciences; Engineer; Prague)

32
B

ORG: none

TITLE: Weldable, austenitic, corrosion-resistant chromium-nickel steel
CZ Pat. No. PV 5077-65, Class 40

fb

SOURCE: Vynalezny, no. 5, 1966, 17

TOPIC TAGS: chromium containing steel, nickel containing steel, weldable steel, corrosion resistant steel, intergranular corrosion, austenitic steel, boron containing steel, nitrogen containing steel

ABSTRACT: This Author Certificate introduces a weldable, austenitic, chromium-nickel steel, resistant to intergranular corrosion containing max 0.08% C, 19.2 ± 2% Cr, 13 ± 3% Ni, 2.2 ± 1.29% Mn, 1.1 ± 0.5% Si, 0.10—0.22% N, and 0.003% B. The total content of Si and Cr should not exceed 20.0% and the total content of Ni and Mn should not be less than 12.0%. [WW]

SUB CODE: 11/ SUBM DATE: 16Aug65/ ATD PRESS: 5022

Card 1/1 LF

L 34910-66 E/P(t)/ETI IJP(c) JD/WB

ACC NR: AP6026592

SOURCE CODE: CZ/0034/66/000/002/0112/0119

AUTHOR: Lobl, Karel--Lebel, K.; Rysava, Marie--Rishava, M.; Bizek, Vaclav;
Abusinov, Alexandr--Abushinov, A.

ORG: State Research Institute for Materials of Construction, Prague (Statni vzkumny
ustav materialu)

TITLE: Influence of heat treatment upon the structural properties of cast steel
Cr18Ni9Ti

SOURCE: Hutnicke listy, no. 2, 1966, 112-119

TOPIC TAGS: cast steel, solid physical property, annealing, corrosion protection,
material fracture, metal heat treatment/Cr18Ni9Ti cast steel

ABSTRACT: The influence of the wall thickness of mechanical properties, on the
annealing temperature, and the time needed for annealing in the elimination of
intercrystalline corrosion is investigated. Isothermal annealing at 750°C was
studied; long term heating to 600 - 700°C in materials with varying ratios of Ti : C
was investigated with respect to notch strength and the appearance of fracture
surfaces. When casting is made at 700 - 800°C the notch strength is decreased
significantly because of precipitation of carbides and of sigma phase. Orig. art.
has: 25 figures and 2 tables. [Based on authors' Eng. abstract] [JPRS: 34,779]

SUB CODE: 11, 20, 13 / SUBM DATE: none / ORIG REF: 005 / OTH REF: 001

Card 1/1

UDC: 669-15: 669.15.26-194

02/6 2587

ACC NR: AP7004410

SOURCE CODE: CZ/0032/67/017/001/0026/0031

AUTHOR: Pluhar, J. (Prague); Lobl, K. (Prague); Sicho, M. (Prague)

ORG: none

TITLE: CSN 42 2916 (ARM) cast heat-resistant stainless steel

SOURCE: Strojirenstvi, v. 17, no. 1, 1967, 26-31

TOPIC TAGS: *CHROMIUM STEEL,* chromium, stainless steel, ~~chromium~~ heat resistant steel, molybdenum ~~containing~~ steel, vanadium ~~containing~~ steel, *SOLID* mechanical property/ARM steel

ABSTRACT: CSN 42 2916 heat-resistant stainless steel (0.16—0.22% carbon, 10.2—11.8% chromium, 0.90—1.20% molybdenum, and 0.20—0.35% vanadium), intended for cast parts used in the power and chemical industries, has been developed. In heat-treated condition (annealed at 1040—1070°C, air cooled and tempered at 720—750) the steel has a tensile strength of 65—85 kp/mm² and the following minimum values of other properties: yield strength 45 kp/mm², elongation 15%, reduction of area 30%, and notch toughness 4 mkp/cm². The 100,000-hr rupture strength at 550 and 600°C was 12.4 and 7.4 kp/mm², and the creep strength (1% total deformation in 100,000 hr) was 8.3 and 5.0 kp/mm², respectively. Orig. art. has: 4 figures and 4 tables. [DV]

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 015/ OTH REF: 002/ SOV REF: 001

Card 1/1

UDC: none

PAPP, Sandor, Dr.; SOLTESZ, Lajos, Dr.; PINTER, Endre, Dr.; LOBLOVICS, Ivan, Dr.

The neurovascular syndrome of the upper extremity. Orv. hetil. 99 no.34:
1172-1175 24 Aug 58.

1. A Budapesti Orvostudományi Egyetem IV. sz. Sebészeti Klinikájának
(igazgató: Kudasz, József dr. egyet. tanár közleménye.
(SCALenus ANTICUS SYNDROME
(Hun))

LENCZ, Iaszlo, dr.; LOBLOVICS, Ivan, dr.

481 Thoracic operations performed under intratracheal anesthesia.
Tuberkulozis 13 no.4:116-120 Ap '60.

1. A Budapesti Orvostudományi Egyetem IV. sz. Sebészeti Klinikájának
(igazgató: Kudasz, József, dr. egyetemi tanár) közleménye.
(THORAX)
(ANESTHESIA INTRATRACHEAL)

LOBLOVICS, Ivan, dr.; PINTER, Endre, dr.

Management of atelectasis following pulmonary operations. Tuberkulozis
14 no.3:90-93 Mr '61.

1. A Budapesti Orvostudományi Egyetem IV sz. Sebészeti Klinikájának
(igazgató: Kudasz József dr. egyetemi tanár) közleménye.

(LUNG surg) (ATELECTASIS ther)

~~ZIMOVICS~~, Ivan, dr.; LENCZ, Laszlo, dr.

Use of tubes of Carlens in anesthetic intubation. Magy sebesz. 14 no.5:
301-306 0 '61.

1. A Budapesti Orvostudományi Egyetem IV sz. Sebészeti Klinikájának
közleménye.

(ANESTHESIA INTRATRACHEAL equip & supply)

LOBLOVICS, Ivan, dr.; GOMORY, Andras, dr.; HUSVETI, Andor, dr.; KUDASZ,
Jozsef, dr.; LENCZ, Laszlo, dr.; MARKOS, Gyorgy, dr.; PAPP, Sandor, dr.;
SZABO, Zoltan, dr.; SZANTO, Katalin, dr.

Data on the organization of preoperative preparation in surgery per-
formed with extracorporeal circulation. Magy. sebeszet 14 no.6:337-
343 D '61.

1. A Budapesti Orvostudományi Egyetem IV sz. Sebeszeti Klinikájának
közleménye.

(HEART MECHANICAL)

PAPP, Sandor, dr.; GOMORY, Andras, dr.; HUSVETI, Sandor, dr.; KUDASZ, Jozsef, dr.; LENCZ, Laszlo, dr.; LOBLOVICS, Ivan, dr.; MARKOS, Gyorgy, dr.; SZABO, Zoltan, dr.; SZANTO, Katalin, dr.

Management of patients during the first 24 hours after the use of extracorporeal circulation. Magy. sebeszet 14 no.6:343-350 D '61.

1. A Budapesti Orvostudományi Egyetem IV sz. Sebeszeti Klinikájának közleménye Igazgató: Kudasz Jozsef dr. egyetemi tanár.

(HEART MECHANICAL)

LOBLOVICS, Ivan, dr.; PAPP, Sandor, dr.; BESZNYAK, Istvan, dr.

Determination of pH during the course of intratracheal anesthesia.
Magy. sebeszet 14 no.6:390-394 D '61.

1. A Budapesti Orvostudományi Egyetem IV sz. Sebeszeti Klinikájának közleménye.

(ANESTHESIA INTRATRACHEAL)
(HYDROGEN ION CONCENTRATION)

MARKOS, Gyorgy, dr.; LOBLOVICS, Ivan, dr.

Anesthesiology of infants with esophageal atresia. Orv. hetil. 102
no.27:1263-1265 2 Je '61.

1. Budapesti Orvostudományi Egyetem, IV Sebészeti Klinika.

(ESOPHAGUS abnorm)

(ANESTHESIA, GENERAL in infancy & childhood)

KUDASZ, Jozsef, dr.; GOMORY, Anadras, dr.; HUSVETI, Sandor, dr.; LENCZ, Laszlo, dr.; LOBLOVICS, Ivan, dr.; MARKOS, Gyorgy, dr.; PAPP, Sandor, Dr.; SZABO, Zoltan, dr.; SZANTO, Katalin, dr.

Experience with extracorporeal circulation in 1st 10 intracardiac operations. Orv. hetil. 102 no.48:2263-2268 26 N '61.

1. Budapesti Orvostudományi Egyetem IV Sebészeti Klinika.

(HEART MECHANICAL)

SZABO, Zoltan, dr.; GOMORI, Andras, dr.; HUSVETI, Sandor, dr.; KUDASZ, Jozsef, dr.;
LENCZ, Laszlo, dr.; LOBLOVICS, Ivan, dr.; MARKOS, Gyorgy, dr.; PAPP,
Sandor, dr.; SZANTO, Katalin, dr.

Intra- and postoperative complications in surgery performed under
extracorporeal circulation. Orv. hatil. 103 no.14:638-643 Ap '62.

1. Budapesti Orvostudományi Egyetem, IV Sebészeti Klinika.

(HEART MECHANICAL)

LOBLOVICS, Ivan, dr.; BESZNYAK, Istvan, dr.

Perforating regional ileitis. Orv. hetil. 103 no.31: 1461-1463 5 Ag
'62.

1. Budapesti Orvostudományi Egyetem, IV. Sebészeti Klinika.
(ILEITIS REGIONAL compl)

HUNGARY

BRANDSTEIN, Laszlo, Dr, LOBLOVICS, Ivan, Dr, HOLICS, Klara, Dr; Tetenyi Ave Hospital, Surgical and Pathoanatomical Wards (Tetenyi Uti Korhaz, Sebeszeti es Korbonctani Osztaly).

"Invaginations of the Small Intestines in Adults."

Budapest, Orvosi Hetilap, Vol 104, No 24, 16 June 1963, pages 1130-1131.

Abstract: The authors discuss three cases of invagination of the small intestine. They were caused by a fibroma, a lipoma and polyposis, respectively. In adults, the disease is usually due to demonstrable pathological changes, mostly tumors. The changes can be diagnosed by detailed passage examinations and surgical removal of tumors might prevent the development of invagination.

2473
1/1

LOBLOVICS, Ivan, dr.; BODNAR, Endre, dr.; BOROCZ, Lajos, dr.;
LITTMANN, Imre, dr.

Modern oximetry in heart surgery. Orv. hetil. 104 no.46:
2181-2182 17 N '63.

1. Tetenyi uti Korhaz, I sz. Sebészeti Osztaly.
(OXIMETRY) (HEART SURGERY)
(EQUIPMENT AND SUPPLIES)

HUNGARY

LITTMANN, Imre, Dr, KENNEDI, Istvan, Dr, LOBLOVICSE, Ivan, Dr, BOROCZ, Lajos, Dr, BODNAR, Endre, Dr; Tetenyi Ave Hospital, I. Surgical Ward (Tetenyi Uti Korhaz, I. Sebészeti Csztaly), Budapest.

"Diagnostic Problems in Advanced Cases of Mitral Stenosis."

Budapest, Orvosi Hetilap, Vol 104, No 37, 15 Sept 63, pages 1741-1744.

Abstract: [Authors' Hungarian summary] It is pointed out by the authors that, in severe mitral stenosis, the diastolic murmur can be completely absent. A long, loud systolic murmur above the apex, on the other hand, can be present without regurgitation in cases of severe mitral stenosis. If a loud murmur of aortic stenosis accompanies mitral stenosis, it does not always indicate a severe case of aortic stenosis. A prolonged, loud systolic murmur above the pulmonary aorta can also occur in cases of mitral stenosis alone. These observations are supported by sample case histories of one patient each. 1 Hungarian, 20 Western references.

1/1

FONO, Renee, dr.; LITTMANN, Imre, dr.; BOROCZ, Lajos, dr.; BUKY, Bela,
dr.; BODNAR, Endre, dr.; LOBLOVICZ, Ivan, dr.; TASNADI, Ferenc, dr.

Cases of patent ductus arteriosus operated on during the
past 14 years. Orv.Hetl,105 no.22:1015-1017 My 31 '64.

1. Budapesti Orvostudományi Egyetem, II. Gyermekklinika és
Orvostovábbképző Intézet, Sebészeti Tanszék.

LOBLOVICS, Ivan, dr.; BODNAR, Endre, dr.

Multiple embolectomy. Orv. hetil. 106 no.26:1231-1232 27 Je'65.

1. Tetenyi uti Korhaz, I. Sebészeti Osztaly.

HANGOS, Gy.; MATYUS, L.; LOBLOVICS, I.

Ileocecostomy. Acta chir. acad. sci. Hung. 6 no.2:183-186 '65.

1. Lehrstuhl fuer Chirurgie (Direktor: Prof. Dr. I. Littmann),
Institut fuer Aertzliche Fortbildung, Budapest.

HUNGARY

BODNAR, Endre, Dr, LOBLOVICS, Ivan, Dr, TOTH, Judit, Dr; Institute of Post-graduate Medical Education, Department of Surgery (Orvostovabbkepzo Intezet, Sebeszeti Tanszek), and B. M. Korvin Otto Hospital, Surgical Ward (B. M. Korvin Otto Korhaz, Sebeszeti Osztaly).

"Experiences with the Smithwick-Telford Operation."

Budapest, Magyar Sebeszet, Vol XIX, No 2, Apr 66, pages 101-106.

Abstract: [Authors' Hungarian summary] On 4 patients, a total of 5 thoracic sympathectomy (Smithwick-Telford) operations were performed. Three of the patients underwent surgery because of occlusion of a main vessel; one had Buerger's disease. By means of the original technique of thoracic sympathectomy as recommended by Smithwick, excellent results were achieved in every case. The uniformly good result is considered to be a condition which must definitely be taken into consideration when the indications for an eventual reconstructive operation are set up. All 11 references are Western.

1/1

LITTMANN, Imre, dr.; LOBLOVIC, Ivan, dr.; BODNAR, Endre, dr.; DOROCZ,
Lajos, dr.

Successful surgery of left atrial myxoma. Orv. hetil. 106 no.50:
2370-2371 12 D ' 65.

1. Orvostovábbképző Intézet, Sebészeti Tanszék.

MARKOS, Gyorgy, dr.; GOMORY, Andras, dr.; HUSVETI, Sandor, dr.; KUDASZ, Jozsef, dr.; LENCZ, Laszlo, dr.; LOBLOVITS, Ivan, dr.; PAPP, Sandor, dr.; SZABO, Zoltan, dr.; SZANTO, Katalin, dr.

Blood coagulation regulation during extracorporeal circulation with protamine sulfate titration. Orv. hetil. 102 no.50:2366-2367 10 D '61.

1. Budapesti Orvostudományi Egyetem, IV sz. Sebészeti Klinika.

(BLOOD COAGULATION) (HEART MECHANICAL)
(SULFATES)

7714 Labday S M Calculation of the rate of loading

[Handwritten signature]

L. C. B. A. 1. R. H.

Hungary/Chemical Technology - Chemical Products and Their Application. Synthetic
Polymers. Plastics, I-

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 63115

Author: Lobner, H.

Institution: None

Title: Use of Sheet Plastics as Interior Finish of Buildings

Original

Periodical: Muanyag-foliak alkalmazasa epuletek belso kikepzeseben, Magyar kemik.,
lapja, 1955, 10, No 9, 262-263; Hungarian

Abstract: Examples are given of the use of plasticized polyvinyl chloride as
finishing material for walls and furniture.

Card 1/1

LOBNYTSEV, K.S.

LOBNYTSEV, K.S.

Tonic and atonic muscle fibers. Dokl.AN SSSR 112 no.6:1116-1118
F 157. (MLRA 10:5)

1.Krasnoyarskiy gosudarstvennyy meditsinskiy institut. Predstavleno
akademikom Ye.N. Pavlovskim.
(MUSCLE)

LOBOB, G.A.

Polarization of internal conversion electrons and positrons emitted after β -decay of a nucleus. Zhur. eksp. i teor. fiz. 39 no.3: 684-688 S '60. (MIRA 13:10)
(Electrons) (Positrons) (Beta rays)