INTERNATIONAL STANDARD

ISO 3581

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AMENDMENT 1
2011-01-15

Welding consumables — Covered electrodes for manual metal arc welding of stainless and heat-resisting steels — Classification

AMENDMENT 1

Produits consommables pour le soudage — Électrodes enrobées pour le soudage manuel à l'arc des aciers inoxydables et résistant aux températures élevées — Classification

AMENDEMENT 1

Reference number
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Foreword

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Amendment 1 to ISO 3581:2003 was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 3, *Welding consumables*.

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AMENDMENT 1

Page 1, Clause 2, Normative references

Replace the reference to ISO 31-0:1992 with the following

ISO 80000-1:2009, *Quantities and units — Part 1: General*

Pages 6, 7, 8, and 9, Table 2

The extract from Table 2 overleaf illustrates most of the changes listed on this page.

In the column heading, "Chemical composition", replace "%" by "% (by mass)".

Add two nominal compositions 23 7 L and 21 10 N in the positions indicated overleaf.

Delete footnote b, cited in the column heading "Chemical composition". Redesignate footnotes c to i as b to h. Reword the new footnote b.

Add reference i to 21 10 N and add " $^{i}Ce = 0{,}05$ % (by mass) " as a new table footnote.

Page 10, Table 3

The extract from Table 3 overleaf illustrates the changes listed on this page.

Add two nominal compositions 23 7 L and 21 10 N in the positions indicated overleaf.

Page 16

Add a new Clause 8.

8 Rounding procedure

For purposes of determining compliance with the requirements of this International Standard, the actual test values obtained shall be subjected to ISO 80000-1:2009, B.3, Rule A. If the measured values are obtained by equipment calibrated in units other than those of this International Standard, the measured values shall be converted to the units of this International Standard before rounding. If an arithmetic average value is to be compared to the requirements of this International Standard, rounding shall be done only after calculating the arithmetic average. If the test method cited in Clause 2 contains instructions for rounding that conflict with the instructions of this International Standard, the rounding requirements of the test method shall apply. The rounded results shall fulfil the requirements of the appropriate table for the classification under test.

Renumber Clauses 8, 9 and 10 as 9, 10 and 11.

Table 2 *(extract)*

Symbol classification by Nominal[b,c,d] composition (ISO 3581-A)	Symbol classification by Alloy Type[d,e] (ISO 3581-B)	Chemical composition[a] % (by mass) C	Si	Mn	P	S	Cr	Ni	Mo	Cu	Nb + Ta	N
Insert after the row starting "(22 9 3 N L)" in the leftmost column												
23 7 N L	—	0,04	1,0	0,4 to 1,5	0,030	0,020	22,5 to 25,5	6,5 to 10,0	0,8	0,5	—	0,10 to 0,20
Insert after the row starting "20 16 3 Mn N L" in the leftmost column												
21 10 N[i]	—	0,06 to 0,09	1,0 to 2,0	0,3 to 1,0	0,02	0,01	20,5 to 22,5	9,5 to 11,0	0,5	0,3	—	0,10 to 0,20
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮

[a] Single values are maxima.

[b] Consumables for which the chemical composition is not listed shall be symbolized similarly and prefixed by the letters Z. The chemical composition ranges are not specified and it is possible that two electrodes with the same Z classification are not interchangeable.

[c] The sum of P and S may not exceed 0,050 % (by mass), except for 25 7 2 N L; 18 16 5 N L; 20 16 3 Mn N L; 18 8 Mn; 18 9 Mn Mo and 29 9.

[d] A designation in parentheses [e.g. (308L) or (19 9 L)] indicates a near match in the other designation system, but not an exact match. The correct designation for a given composition range is the one not in parentheses. A given product, by having a more restricted chemical composition that fulfils both sets of designation requirements, may be assigned both designations independently.

[e] Analysis shall be made for the elements for which specific values are shown. If, however, the presence of other elements is indicated in the course of routine analysis, further analysis shall be made in order to determine that the total of these other elements, iron excepted, is not present in excess of 0,50 % (by mass).

[f] Vanadium shall be from 0,10 % (by mass) to 0,30 % (by mass); titanium shall be 0,15 % (by mass) maximum; tungsten shall be from 1,25 % (by mass) to 1,75 % (by mass).

[g] Tungsten shall be 1,0 % (by mass) maximum.

[h] On the mass basis, vanadium shall be from 0,10 % (by mass) to 0,30 % (by mass).

[i] Ce = 0,05 % (by mass).

Table 3 *(extract)*

Nominal composition (ISO 3581-A)	Alloy symbol (ISO 3581-B)	Minimum proof strength $R_{p0,2}$ MPa	Minimum tensile strength R_m MPa	Minimum elongation[a] %	Post weld heat treatment
Insert after the row starting "(22 9 3 N L)" in the leftmost column					
23 7 N L	—	450	570	20	none
Insert after the row starting "20 16 3 Mn N L" in the leftmost column					
21 10 N	—	350	550	30	none
⋮	⋮	⋮	⋮	⋮	⋮

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