

MATERIAL TYPE NUMBERS

FRAMEWORK

DIN 17007
Sheet 1

1. GENERAL

This standard contains a number system which can be machine processed for materials of all kinds, which can be used in addition to the standardised brand designations as laid down for example, for iron and steel in DIN 17006 and for non-ferrous metals in DIN 1700. The use of the standardised brand designations is not thereby impaired.

In correspondence the symbol WNr can be used in place of the word material type number.

2. FORMATION OF MATERIAL TYPE NUMBERS

The material type numbers are seven digit. They comprise

Material principle group	_____	X	.	XXXX	.	XX
Grade number	_____					
Suffix numbers	_____					

3. MATERIAL PRINCIPLE GROUPS

The following framework is applicable to the material groups:

- 0 and 1 iron and steel
 - 0 pig iron and ferro-alloys
 - 1 steel
- 2 and 3 non-ferrous metals
 - 2 heavy metals with the exception of Fe
 - 3 light metals
- 4 to 8 non-metallic materials
- 9 free for internal use

In the principle groups 0 and 1 belong all materials in which Fe represents the largest individual constituent.

The sub-division of the non-metallic materials within the principle groups 4 to 8 is to be carried out in a later regulation.

The principle group 9 is not allocated in the framework plan, it is available for the respective users for the purpose of forming material type numbers for internal purposes, e.g. for the numbering of materials for experimental purposes, such as experimental alloys.

4. GRADE NUMBERS

Fundamentally the grade numbers are formed in accordance with the chemical composition of the materials or in accordance with their origin.

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5. SUFFIX NUMBERS

The suffix numbers (6th and 7th places of the material type number) are provided in order to express particular indications, such as the smelting or casting method, heat treatment, cold-forming etc. Dimensions, form, surface details of semi-finished and finished products are not covered by the suffix numbers.

6. WRITTEN AND VERBAL EXPRESSION OF THE MATERIAL TYPE NUMBERS

The full stops between the individual digits of the material type numbers are to be written in as an essential constituent,

e.g. 2.1151.72

It is recommended that the full stops are expressed in speech.

7. CONFERRING OF THE MATERIAL TYPE NUMBERS

Material type numbers for iron and steel are laid down by the Technical Standards Committee for Iron and Steel (FES), for non-ferrous metals by the Technical Standards Committee for Non-ferrous metals (FNNE) and published in the continuation sheets to DIN 17007. It is left to the Technical Standards Committees to develop the system of type numbers and the suffix numbers in accordance with the appropriate requirements.

The material type numbers for iron and steel are contained in DIN 17007, sheet 2.

The material type numbers for non-ferrous metals are contained in DIN 17007, sheet 4.

8. INTRODUCTION OF MATERIAL TYPE NUMBERS

The Technical Standards Committees for Iron and Steel and for Non-ferrous metals give the material type numbers as well as the standardised brand designations in their standards. In tables the material type numbers are listed in the column after the brand designations.

MATERIAL TYPE NUMBERS

Principle group 1: steel

DIN 17007
Sheet 2

1. GENERAL

DIN 17007, sheet 1 is applicable to the formation of material type numbers. In accordance with this we have in the

	x.	xxxx.	xx
1st place, the material principle group			
2nd to 5th place, the grade numbers,			
the chemical composition			

6th and 7th place, the suffix numbers,
steel-making process and applied treatment

2. RANGE OF VALIDITY OF MATERIAL PRINCIPLE GROUP 1.

- 2.1. Material principle group 1 comprises all steels, including cast steel.
- 2.2. Regarded as steel ¹⁾ is a ferrous material which exhibits no iron-carbon eutectic-signifying in general a carbon content of less than 2.0% - and which in general is sufficiently ductile to be capable of being shaped at room temperature and at high temperatures
- 2.3. In accordance with DIN 17007, sheet 1 all materials containing the chemical element iron as their largest individual constituent are regarded as ferrous materials.

3. GRADE NUMBERS

- 3.1. In the grade numbers the first two places signify the grade classes which are sub-divided according to the following groups corresponding to the table:
 - 3.1.1. Mass produced and high grade steels. Within this group a further sub-division is made in accordance with proportion and chemical composition.
 - 3.1.2. Fine steels. Within this group further sub-divisions are made in accordance with the chemical composition and characteristic properties which result from production and application conditions.
- 3.2. The two additional places of the grade number are count numbers which give no inferences, e.g. with respect to carbon or alloy content.
- 3.3. The grade numbers are laid down by the Technical Standards Committee Iron and Steel in agreement with the participating bodies 2).

4. SUFFIX NUMBERS

- 4.1. Suffix numbers are only to be applied when the individual case requires it for the clear identification of the material.

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significantly impair the processing and application of the wire rod appropriate to its grade.

4.2. The ordering firm must provide the supplier with the opportunity with satisfying himself with regard to the justification of complaints, where possible by submission of samples of the material which is the subject of the complaint.

4) Manual for the metallurgical laboratory, volume 2: investigation of metallic materials, Düsseldorf: Verlag Stahleisen mbH, 1941 and volume 4: Arbitration analyses Düsseldorf: Verlag Stahleisen mbH, 1955.

4.2. The 1st suffix number is for the identification of the s t e e l-m a k i n g p r o c e s s (smelting and casting method). It signifies:

- 0 uncertain or without significance
- 1 unkilld Thomas steel
- 2 killed Thomas steel
- 3 unkilld steel produced by another method of smelting, e.g. air-refined special analysis steel
- 4 killed steel produced by another method of smelting, w.g. air-refined special analysis steel
- 5 unkilld Siemens-Martin steel
- 6 killed Siemens-Martin steel
- 7 unkilld oxygen injection steel
- 8 killed oxygen injection steel
- 9 electric steel

4.3. The 2nd suffix number is for the identification of the a p p k i e d t r e a t- m e n t. It signifies:

- 0 no or any treatment (no particular heat treatment following shaping desired or guaranteed; falling into this category are products delivered in the normal hot-rolled state)
- 1 normalised
- 2 soft annealed
- 3 heat treated for good machinability
- 4 quenched and tempered for toughness
- 5 quenched and tempered
- 6 quenched and tempered for hardness
- 7 cold formed
- 8 spring hard cold formed
- 9 treated in accordance with special instructions

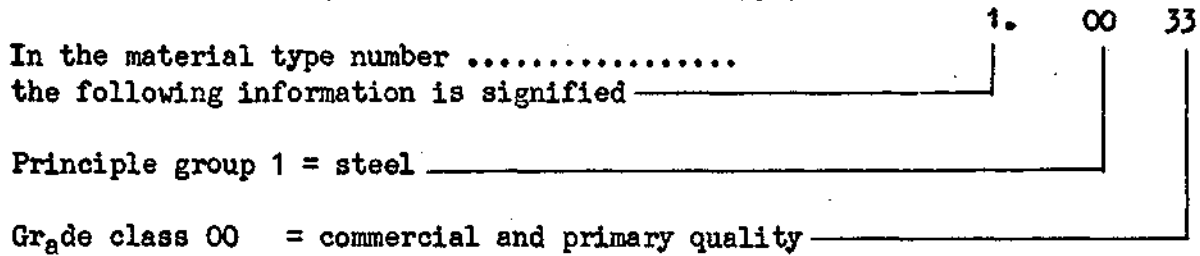
5. IDENTIFICATION OF ADDITIONAL CHARACTERISTICS

The definition of the means of identifying additional material characteristics or supply specifications, e.g. for surface finish, will be covered in a later supplement to this standard.

Continuation pages 2 and 3

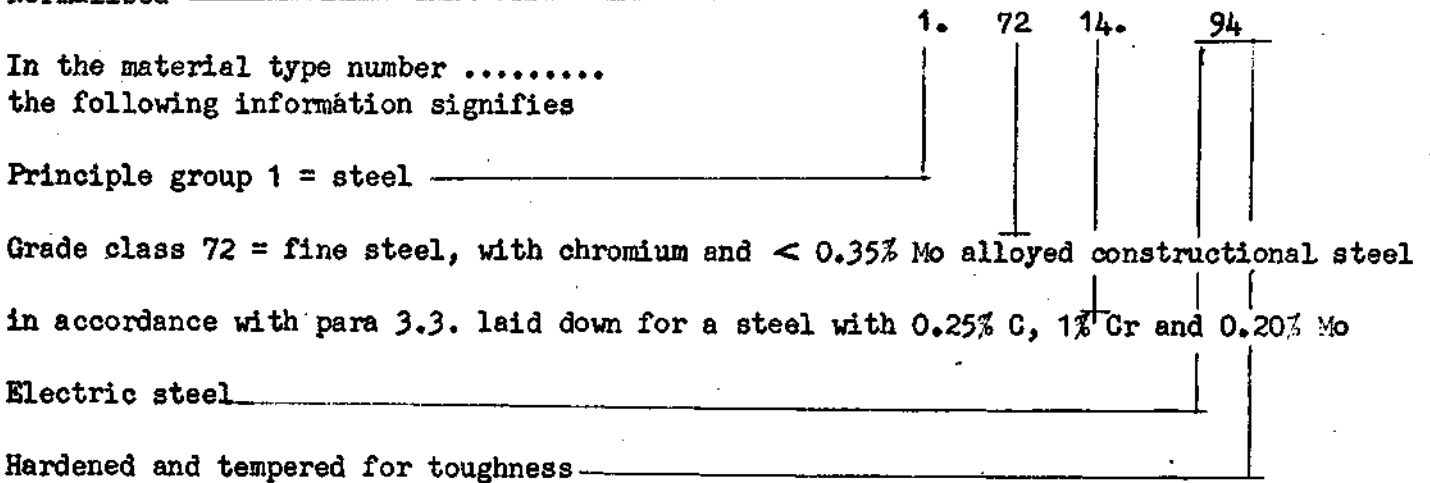
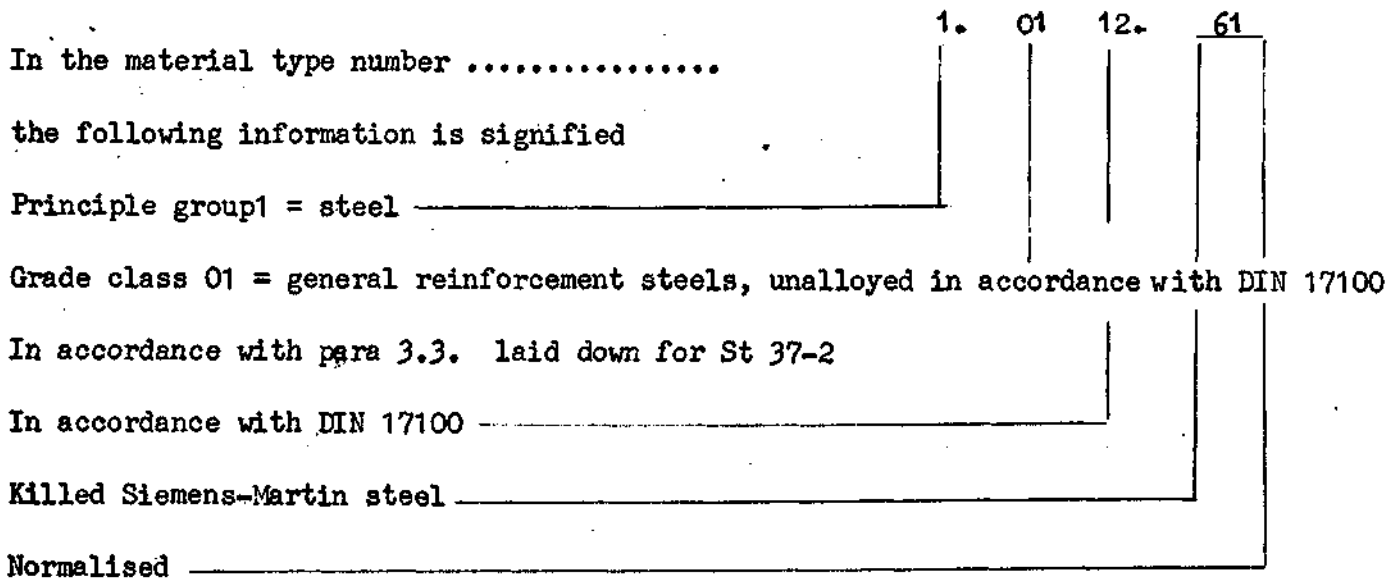
- 1) A standard is in preparation concerning the designation and sub-division of iron and steel.
- 2) e.g. Association of German Metallurgists

Examples for the significance of a material type number



In accordance with para 3.3. laid down for St 33 in accordance with DIN 17100

Suffix numbers for steel-making process and applied treatment are unnecessary in this case.



NOTE:

The material type numbers for all previously standardised steels are to be found in standards publication 3 in accordance with abbreviated names and material numbers of the ferro materials in DIN standards and Steel-Iron material data sheets.

- DIN 17007 Material type numbers
- Sheet 1 Framework
- Sheet 4 Principle groups 2 and 3: non-ferrous metals

- 1 = mass produced and high grade steels 2 = general grades 3 = special grades
- 4 = unalloyed fine steels 5 = tool steels 6 = various steels 7 = fine steels
- 8 = alloyed fine steels 9 = materials resistant to chemicals 10 = constructional steels
- 11 = commercial and primary qualities 12 = steels with special physical characteristics
- 13 = molybdenum-free without special additives 14 = general constructional steels, unalloyed up to 0.30% C
- 15 = in accordance with DIN 17100 16 = containing molybdenum without special additives
- 17 = others 18 = high speed steels 19 = containing cobalt 20 = cobalt-free
- 21 = wear-resistant steels 22 = rust proof steels with $\geq 2.0\%$ Ni
- 23 = Mo. (incl. Mn, Si) 24 = unalloyed high grade steels 25 = ball and roller bearing steels
- 26 = with special additives 27 = nitride steels 28 = with higher P and/or S-content
- 29 = quality 30 = containing nickel 31 = ferro-materials with special physical characteristics
- 32 = alloys with special magnetic characteristics 33 = cobalt-free apart from Ni-Al-alloys
- 34 = containing cobalt and Ni-Al-alloy 35 = heat resistant steels 36 = with
- 37 = hard alloys 38 = apart from classes 57 to 68 39 = high temperature materials
- 40 = nickel-free 41 = other alloys 42 = for special purposes 43 = alloyed high grade steel
- 44 = given in the individual boxes of the table are the material types or the principle alloy constituents in addition to the numbers of the grade classes.

MATERIAL TYPE NUMBERS

Principle group 0:

Pig iron, master alloys, cast iron

DIN 17007
Sheet 3

1. GENERAL

DIN 17007, sheet 1 is applicable for the formation of material type numbers. In accordance with this we find in the

	x.	XXXX.	XX
1st place, the principle group			
2nd to 5th place, the grade numbers, the chemical composition			
6th and 7th place, the suffix numbers, further sub-division characteristics			

2. RANGE OF VALIDITY OF PRINCIPLE GROUP 0

The principle group 0 comprises the following material groups:

- a) pig iron
- b) master alloys, i.e. deoxidation and alloyers including ferro-alloys as are preferably utilised for the metallurgical production of iron and steel.
- c) cast iron including malleable cast iron and special cast iron.

3. GRADE NUMBERS

3.1. In the grade numbers the two first places signify the grade classes which in accordance with the Table (page 2) are sub-divided as follows:

3.1.1. Pig iron

- a) general grades for steel production
- b) general grades for casting production
- c) special pig iron

3.1.2. Master alloys

Deoxidation and alloyers including ferro-alloys are sub-divided in accordance with their alloy constituents and in part in accordance with their manufacturing process, e.g. master alloys produced in a blast furnace.

3.1.3. Cast iron

- a) cast iron with lamellar graphite
- b) cast iron with globular graphite,
- c) malleable cast iron and
- d) special cast iron.

Within these groups a further sub-division in accordance with chemical composition where the sequence is in general in accordance with the alloy element having the largest individual content (in percentage/weight).