



NORMALIZACIÓN ESPECIFICACIÓN TÉCNICA

DT-03/1

NIC: 980301

STEEL SUPPLY GENERAL CONDITIONS

HOJA:

1.- AIM:

1.1.- To define the general requirements for the delivery of raw material to FORJAS DE CANTABRIA, S.L.

1.2. - Other particular requirements not defined in this specification will be asked for FORJAS DE CANTABRIA S.L., in purchase order, or in other documents previously agreed with the STEEL MAKER.

2.- APPLICATION FIELD:

2.1.- Billets and round profiles rolled with an area of up to 625 cm^2 , obtained through a process of melting in ingot or continuum casting, with or without a subsequent rolling, to be worked by forging process or hot die forging in FORJAS DE CANTABRIA, S.L.

2.2.- The continuum casting process must be previously officially recognised by:

1º The client of FORJAS DE CANTABRIA S.L., as the customer of the products/pieces that will be obtained from that material.

2º FORJAS DE CANTABRIA S.L., as the manufacturer in its installations of that material to forged pieces.

2.3. - Only when the STEEL MAKER has the continuum casting process officially recognised in writing, can the castings be obtained in such a way.

2.4. - FORJAS DE CANTABRIA S.L., will keep as a standard the samples used during the official recognition process.

3.- AGREEMENT:

Procedure of steel reception of FORJAS DE CANTABRIA, S.L. (PG-CC-05).



NORMALIZACIÓN ESPECIFICACIÓN TÉCNICA

DT-03/1

NIC: 980301

STEEL SUPPLY GENERAL CONDITIONS

HOJA:

4.- DOCUMENTATION:

4.1.- Every delivery will come with its DELIVERY NOTE, where the kind of material, the special requirements (if relevant), dimensions, casting numbers, weights of castings, order numbers, transport agency and date of sending will appear.

4.2.- In the same way with every delivery the CASTING CERTIFICATE will have the following information:

- Identification of kind of casting (ingot or continuous casting).
- Chemical Analysis of the casting.
- Antimixture Certification 100%.
- Surface control Certification 100%.
- Other special requirements asked for in the specification or order.

4.3.- Additionally, with every casting must be sent a piece of steel belonging to it on which will be stamped the casting number. The size of this sample will be enough (40 x 40 x 20 mm) to check the chemical composition with a spectrometer. This sample will be sent only with the first delivery of the casting for the attention of the LABORATORY.

4.4.- In the case of continuous casting two transversal cuts of two different bars with a width of 15 to 20 mm will be sent in order to carry out a chemical test and a macrography, These samples must also be stamped with the casting number. These samples will be sent only with the first delivery of the casting for the attention of the LABORATORY.

4.5.- The lack of delivery note., quality certificate or steel sample of the casting for checking chemical composition and/or macrography, will result in the refusal of the whole casting, either by:

- A) Physical return of the whole casting.
- B) Parking of the casting (pending) considering the material as not received at all.

In exceptional circumstances, when the delivery of steel was permitted without the agreement of all the requirements, the name of the person that authorized the delivery must be shown in the delivery note.



NORMALIZACIÓN ESPECIFICACIÓN TÉCNICA

DT-03/1

NIC: 980301

STEEL SUPPLY GENERAL CONDITIONS

HOJA:

5.- DESIGNATION OF STEEL QUALITY:

5.1.- It will be defined in the purchase order, according to:

- Spanish official Standards.
- International official Standards.
- Particular Designation of FORJAS DE CANTABRIA S.L., or its customer.

5.2.- FORJAS DE CANTABRIA S.L., likewise, will show the special requirements to be applied to the steel in the purchase order.

6.- DELIVERY:

6.1.- The material will be delivered secured tied and in such a way that each of them should be made up only of bars of the same profile and belonging to the same casting.

6.2.- The weight of every tied will be between 1,5 Tm and 3 Tm.

6.3.- The cable that secure the bars will be double fastened and will have a minimum diameter of 8 mm. In this way the impossibility of breakage during the handling is guaranteed. These cables will be located a minimum of 1,5 m from each other.

6.4.- The material will be sent with slings for the linking of the bars during the handling and unloading at Forjas de Cantabria. The distance between slings will be from 2 to 3 m. In this way the load is balanced during the handling.

6.5.- Every batch of material belonging to one purchase order must be divided in as many parts as the heats that constitute it.

6.6.- Every casting must be sent in a single delivery and divisions of it are not allowed, except when the weight were bigger than the transport capacity, that the divisions of casting were applied to different purchase orders, that they were rolled to different diameters or that the weight requested were lower than a normal vehicle load. Different castings from the same quality and diameter as well as different qualities with the same diameter are not allowed in the same vehicle.



NORMALIZACIÓN ESPECIFICACIÓN TÉCNICA

DT-03/1

NIC: 980301

STEEL SUPPLY GENERAL CONDITIONS

HOJA:

7.- IDENTIFICATION:

7.1.- In the bars with diameter bigger than 100 mm, or equivalent area the casting number will be stamped on it. This mark will be stamped on the end of the bars. In addition each tied will have a label previously approved by FORJAS DE CANTABRIA, S.L. In the bars with diameter 100mm or less or equivalent area the number of casting should be on a label stuck on one end. Any other identification system must be approved by FORJAS DE CANTABRIA S.L.

7.2.- For the bars with less area all the ties must have at least two labels.

8.- CHEMICAL COMPOSITION:

8.1.- The chemical analysis will be shown on the casting quality certificate, where the residual elements (Cr, Ni, Mo, Al, Ti, firstly) in the carbon and alloyed steels must be included.

8.2.- FORJAS DE CANTABRIA S.L., will check every casting and will apply the tolerances authorized by the official standards to which the steel belongs or by the specifications defined by the CUSTOMER of FORJAS DE CANTABRIA S.L.

8.3.- For steels whose official standard has not got allowed tolerances and for the ones with particular designation from FORJAS DE CANTABRIA S.L, or its customer , the following allowances will be applied:

ELEMENT	LIMIT SPECIFIED IN %	TOLERANCE
Carbon	Up to 0,25	± 0,01
Carbon	More than 0,25 up to 0,60	± 0,02
Carbon	More than de 0,60	± 0,03
Silicon	Up to 0,40	± 0,02
Silicon	More than 0,40 up to 2,20	± 0,05
Manganese	Up to 0,90	± 0,03
Manganese	More than 0,90 up to 2,10	± 0,04
Manganese	More than 2,10	± 0,10
Phosphorus	Up to 0,06	± 0,005
Sulfur	Up to 0,06	± 0,005
Sulfur	Resulfurated Steels	± 0,005
Chromium	Up to 0,85	± 0,03
Chromium	More than 0,85 up to 2,20	± 0,05
Chromium	More than 2,20 up to 4,00	± 0,10
Nickel	Up to 1,00	± 0,03
Nickel	More than 1,00 up to 2,00	± 0,05
Nickel	More than 2,00 up to 5,50	± 0,07
Molibdeno	Up to 0,15	± 0,01
Molibdeno	More than 0,15 up to 0,30	± 0,02
Molibdeno	More than 0,30 up to 1,00	± 0,03
Vanadium	Up to 0,10	± 0,01
Vanadium	More than 0,10 up to 0,25	± 0,02



NORMALIZACIÓN ESPECIFICACIÓN TÉCNICA

DT-03/1

NIC: 980301

STEEL SUPPLY GENERAL CONDITIONS

HOJA:

8.1.- Residual elements, not planned in the chemical composition of the casting, will not exceed following values:

ELEMENT	LIMIT SPECIFIED IN %
Chromium	Up to 0,30
Níckel	Up to 0,40
Molibdeno	Up to 0,15
Vanadium	Up to 0,05
Cooper	Up to 0,25
Tin	Up to 0,05
Aluminium	Up to 0,04
Titanium	Up to 0,04

9.- DIMENSIONAL TOLERANCES:

9.1.- ROUND BARS:

9.1.1.- In diameter.

NOMINAL DIMENSION	TOLERANCE
More than 15 up to 25 mm	0,5 mm
More than 25 up to 35 mm	0,6 mm
More than 35 up to 50 mm	0,8 mm
More than 50 up to 80 mm	1,0 mm
More than 80 up to 100 mm	1,3 mm
More than 100 up to 120 mm	1,5 mm
More than 120 up to 160 mm	2,0 mm
More than 160 mm	2,5 mm



NORMALIZACIÓN ESPECIFICACIÓN TÉCNICA

DT-03/1

NIC: 980301

STEEL SUPPLY GENERAL CONDITIONS

HOJA:

The values indicated in the above table will be used for setting the maximum and minimum dimensions. Although within the same casting, the dispersion (difference between minimum and maximum dimension) will not be more than 70% of the indicated values. The purpose is that once fixed the billet length to cut for a piece is fixed, the variations of billets weight will be inside the design defined parameters to obtain the piece in a correct way the piece

9.1.2.- Oval.

Maximum 80% of the diameter allowed tolerance.

9.1.3.- Straight.

Maximum bending of 0,25% of the total length of the bar.

9.1.4. - Length

The end of the bars will be cut with a saw or shears by casting, but the cut will always be clean and the ends of the bars will not show distortion or bending of the material, that is why it is recommended the cutting by saw or by other methods which permit the integral use of the bar.

The length of bars will be between 4 and 8 metres.

9.1.5. - Twisting.

The twisting per meter length will not be more than 2º, with a maximum of 12º in 8 meter long bars.

9.1.6. - Hot shear.

The tolerance to be applied by the Blooming, in the bars cut, will be +20 / -0 mm with every billet to be obtained from the bar.

The minimum length of these bars will be 4 meters.

9.1.7. - Cold sawing.

When the cold cut is used and the bars are up to 4 meters, the following tolerances must be applied:

If you obtain 1 or 2 multiples:

+ 10 mm for the first multiple.

+ 20 mm for the second multiple.

If you obtain 3 or more multiples:

+15 / -0 mm for each multiple.



NORMALIZACIÓN ESPECIFICACIÓN TÉCNICA

DT-03/1

NIC: 980301

STEEL SUPPLY GENERAL CONDITIONS

HOJA:

9.2.- SQUARE BILLET

9.2.1. - Twisting.

The twisting per length meter will not be more than 2° , with a maximum of 12° in 6 meters long bars.

9.2.2. - Straight.

Maximum bending of 0,25% of the total length of bar.

9.2.3. - Diagonal.

The difference between two diagonals in the same section will not be more than 6% of the biggest diagonal.

9.2.4. - Weight per meter and side.

Tolerances according to the following table:

SQUARE BILLET mm	PROFILE TOLERANCE mm	WEIGHT PER METER Kg/m	TOLERANCE WEIGHT/METER (Kg/m)
80	± 1	49,27	$\pm 1,5$
85	± 1	55,49	$\pm 1,5$
90	± 1	62,36	$\pm 1,5$
95	± 1	69,33	$\pm 1,6$
100	± 1	76,88	$\pm 1,8$
105	± 1	85,02	$\pm 1,9$
110	$\pm 1,2$	93,46	$\pm 2,1$
115	$\pm 1,2$	101,12	$\pm 2,2$
120	$\pm 1,2$	110,35	$\pm 2,3$
125	$\pm 1,2$	119,96	$\pm 2,4$
135	$\pm 1,5$	140,38	$\pm 3,2$
145	$\pm 1,5$	162,36	$\pm 3,5$
155	$\pm 1,5$	185,91	$\pm 3,7$
165	$\pm 2,0$	211,79	$\pm 5,2$
175	$\pm 2,0$	238,48	$\pm 5,6$
185	$\pm 2,0$	266	$\pm 5,9$
190	$\pm 2,0$	280,72	± 6



NORMALIZACIÓN ESPECIFICACIÓN TÉCNICA

DT-03/1

NIC: 980301

STEEL SUPPLY GENERAL CONDITIONS

HOJA:

10.- DELIVERY CONDITION:

In raw rolled condition, except when there is another indication in purchase order or specification.

11.- REDUCTION COEFFICIENT:

11.1.- The ratio between the area of the middle transverse section of the ingot and the section of the bar will not be less than 3.

11.2.- In the case of continuous casting rerolled, the quality certificate should show the reduction coefficient.

11.3.- In addition if it is used a direct continuous casting process without any subsequent rolling process, this must be reported

12.- FORGEABILITY:

The bars will comply with the level for forging, defined in the following technological test: hot upsetting at 1/3 of the height of a test specimen with the same section of the bars to be delivered and with a length twice that of the side.

13.- SURFACE DEFECT TOLERANCES:

13.1.- The entire surface of the bars will be free from any defect that could result in the RECOVERY, UNUSABILITY OR THE SCRAPPING of the pieces once they have been forged.

13.2.- The recovery by the grinding of one or several bars of a heat must not affect the measure of the profile in such a way that it does not comply with the tolerances of dimensional homogeneity indicated in points 9.1.1, 9.1.4 y 9.2.4.

13.3.- The STEEL MAKER can deal with FORJAS DE CANTABRIA S.L. QUALITY, the acceptance of part or the whole casting, in the case of a dimension out of tolerance. In the case of acceptance, it will be delivered in the agreed conditions (separated, identified, etc.). FORJAS DE CANTABRIA S.L. will always try to find the less painful solution for its customer and the most economical for both parties.



NORMALIZACIÓN ESPECIFICACIÓN TÉCNICA

DT-03/1

NIC: 980301

STEEL SUPPLY GENERAL CONDITIONS

HOJA:

14.- METALURGICAL QUALITY:

14.1.- The transversal macrography , will show a steel blunt enough, without contraction cavities, freedom of flakes, blow holes and other defects.

14.2.- The longitudinal macrography will show a homogeneous fibre, without zones with fibre in different direction..

14.3.- In continuous casting, the longitudinal and transverse macrography must show a maximum of the same level of defects such as, core segregation, segregation line, contraction cavities, and other defects, that were shown in the samples used for official approval.

14.4.- Apart from particular indications, the mechanical characteristics, hardenability and material cleanliness, will be inside the limits defined by the standardization, for each material and suitability for automotive quality use. In general, the delivery of steel will comply the following minimum metallurgical:

14.4.1. Micro cleanliness according to Standard ASTM E45.

A(sulfuros) Thin 3.0 Heavy 2.0

B (Aluminas) Thin 3.0 Heavy 2.0

C (Silicatos) Thin 3.0 Heavy 2.0

D (Oxido) Thin 2.0 Heavy 1.0

14.4.2. Grain size 5 ÷ 8 (or more) according to Standard UNE 7-280-72.

14.4.3. Macroinclusions according to Standard ASTM E381.

14.5.- For steels with specific chemical composition from FORJAS DE CANTABRIA S.L. or its customer, where mechanical characteristics are requested, they must be previously sent to the ACERISTA, for its approval.

14.6 - Except for 38MnVS5 microalloyed steels, Micro 900 and C38ModBY, Hydrogen content for different materials depending on the diameter shall not exceed the following values:

100mm<140mm \emptyset ≤:1.4ppm

140mm<175mm \emptyset ≤:1.3ppm

175mm<240mm \emptyset ≤:1.2ppm



NORMALIZACIÓN ESPECIFICACIÓN TÉCNICA

DT-03/1

NIC: 980301

STEEL SUPPLY GENERAL CONDITIONS

HOJA:

Hydrogen content of each of the cast has to go included in the certificate issued by the steelmaker.

14.7 -. The steelmaker must certify ultrasound control for all grades and profiles S / EN 10308:2001 E. Criterion for Class 3

15.- SAWING APPROPRIATENESS:

The bars in raw rolled condition will have a hardness of up to 300 HB, which permits the sawing or cold shearing.

16.- REJECTIONS AND RETURNS:

16.1.- The fact that the steel maker accepts a purchase order and delivery of a material, assumes the acceptance of these GENERAL STEEL DELIVERY TERMS, as well as the particular ones indicated in the purchase order.

16.2.- FORJAS DE CANTABRIA S.L., will direct its policy of purchasing to be officially approved by quality guaranteed STEEL MAKERS. Nevertheless, FORJAS DE CANTABRIA, S.L. will undertake all the testing and practices by casting which are considered necessary , as much during reception state as during the transformation process.

16.3.- In the case of rejection, FORJAS DE CANTABRIA S.L. will send to the steel maker, along with the rejected casting, a report of rejection with the reason and the affected quantity, enclosing samples where the problem is shown.

16.4.- For a complaint regarding rejections, the STEELMAKER will show a certificate with the tests undertaken, if possible with the same samples sent by FORJAS DE CANTABRIA. If any arbitration is necessary, we will use the advice of an official organization with proven expertise such as CENIM, ESCUELA TEC. SUP. INGENIEROS INDUSTRIALES, INASMET, etc.



NORMALIZACIÓN ESPECIFICACIÓN TÉCNICA

DT-03/1

NIC: 980301

STEEL SUPPLY GENERAL CONDITIONS

HOJA:

17.- COSTS BY DEFECTS ATTRIBUTABLE TO THE STEEL.

17.1.- The details shown in point 16.2 (the FORJAS DE CANTABRIA S.L. policy), are focussed on buying steel from the officially recognised STEEL MAKERS, with the agreed quality. The quality controls of reception for this product are not very reliable, but very expensive, so the target is to eliminate this.

17.2.- When then defects attributable to the steel appear during the manufacturing, it will be quickly communicated to the STEEL MAKER quality department, indicating:

- A) Information for identification: Steel, profile, heat, etc.
- B) The weight of product with the problem.
- C) Type of defect.
- D) Phase (point of the manufacturing process where the problem was detected).

17.3.- All the material returned will be charged to the STEEL MAKER with the following costs:

- A) Steel.
- B) Transport.
- C) Works before Phase (point of the manufacturing process where the problem was detected).

17.4.- For the charges we will follow the following procedure:

- 1º A first charge for the value of the material and the transport, which will be paid according the agreements between Purchasing/Commercial Departments.
- 2º A second charge for the value of the operations undertaken on the pieces up to the phase where the problem was detected. Additionally, this will be paid according the agreements between Purchasing/Commercial Departments.

17.5.- The Charges issued by CUSTOMERS of FORJAS DE CANTABRIA, S.L., for defects clearly attributed to the steel, will be charged to the STEEL MAKER.

18.- GENERAL TERMS.

19.- CHANGES.