

APPROVED
FRENCH
STANDARD
SPECIFICATION

IRON & STEEL PRODUCTS
ALLOY & NON ALLOY CARBON STEEL
WIRE RODS FOR THE MANUFACTURE OF
WELDING WIRES FOR GAS SHIELDED AND
FLUX POWDER ELECTRIC ARC WELDING
GRADES & QUALITIES

NF
A 35-050
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CONTENTS

	Page
1. GENERAL.....	1
1.1 PURPOSE.....	1
1.2 SCOPE.....	1
2. GRADES & QUALITIES	2
2.1 GRADES & QUALITIES AVAILABLE.....	2
2.2 CHEMICAL COMPOSITION	2
Tables I & II - Chemical Composition.....	2
3. SUPERFICIAL APPEARANCE. INTERNAL SOUNDESS.....	3
4. INSPECTION	3
4.1 VERIFICATION OF THE CHEMICAL COMPOSITION.....	3
4.2 ANALYSIS METHOD	3
5. MARKING	3

1. GENERAL

1.1 PURPOSE

The purpose of the present Standard Specification is the definition of the non alloy & alloy carbon steel wire rod grades and qualities for gas shielded and for flux electric arc welding.

1.2 SCOPE

The present Standard Specification is of application for non alloy and alloy carbon steel wire rod grades(*) for the manufacture of welding wires for gas shielded and for flux electric arc welding

The present document is however irrelevant when concerning products for which different Standards or Specifications have been provided for, such as

- wire rods for cold drawing and cold rolling (NF A 35-051) ;
- wire rods for hot & cold forming (NF A 35-053) ;
- wire rods for the manufacture of coated electrodes (NF A 35-055).

(*) Dimensions of the wire rods covered by the present Standard Specification must fully comply with the size tolerances determined by the NF A 45-051 Standard Specification

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The present document is a translation of the above French Standard Specification. Should any question or doubt arise concerning its interpretation, reference is exclusively to be made to the original French text as remaining the sole valid.

2. GRADES AND QUALITIES

2.1 GRADES AND QUALITIES AVAILABLE

Wire rod grades and qualities specified in Table I & II are characterized by their chemical composition as of the products (check) analysis.

2.2 CHEMICAL COMPOSITION

2.2.1 Electrode wire for gas shielded electric arc welding

The admissible composition range for each element in product (check) analysis appear in Table

TABLE I - CHEMICAL COMPOSITION

Qualities	C % max	Mn %	P % max. (*)	S % max. (**)	Si %	Al %	Ni % max.	Cr % max.	Mo %	Cu % max.	Ti %
FG 10 MS 4	0,12 (*)	0,80-1,10	0,030	0,030	0,40-0,70		0,15	0,15		0,12	
FG 10 MS 5	0,13 (*)	1,00-1,30	0,030	0,030	0,50-0,80		0,15	0,15		0,12	
FG 12 MS 6	0,14 (*)	1,30-1,60	0,030	0,030	0,70-1,00		0,15	0,15		0,12	
FG 12 MS 6.4	0,14 (*)	1,30-1,60	0,030	0,030	0,90-1,20		0,15	0,15		0,12	
FG 12 MS 7.4	0,14	1,50-1,80	0,030	0,030	0,90-1,20		0,15	0,15		0,12	
FG 12 MSD 6	0,14	1,70-2,10	0,030	0,030	0,50-0,80		0,15	0,15	0,40-0,60	0,12	
FG 10 M 5 ATi 5	0,12 (*)	1,10-1,40	0,030	0,030	0,50-0,80	0,05-0,20	0,15	0,15		0,12	0,05-0,20

(*) By agreement when ordering the max. carbon content can be lowered down to 0.12% or 0.10 %
 (**) By agreement when ordering phosphorus and sulfur max. contents can be lowered down to 0.025 %

2.2.2 Electrode wire for flux electric arc welding

The admissible product analysis range limits are specified in Table II.

TABLE II - CHEMICAL COMPOSITION

Qualities		Mn %	P % max. (*)	S % max. (*)	Si % max.	Ni % max.	Cr % max.	Mo %	Cu % max.
FS 10	0,05-0,12	0,40-0,60	0,030	0,030		0,15	0,15		0,12
FS 12	0,06-0,13	0,40-0,60	0,030	0,030	0,10	0,15	0,15		0,12
FS 12 M 4	0,07-0,14	0,90-1,20	0,030	0,030	0,10	0,15	0,15		0,12
FS 12 M 6	0,07-0,14	1,40-1,70	0,030	0,030	0,10	0,15	0,15		0,12
FS 12 M 8	0,07-0,14	1,80-2,20	0,030	0,030	0,10	0,15	0,15		0,12
FS 12 MD 4	0,07-0,14	0,90-1,20	0,030	0,030	0,10	0,15	0,15	0,45-0,60	0,12
FS 12 MD 8	0,07-0,14	1,80-2,20	0,030	0,030	0,10	0,15	0,15	0,45-0,60	0,12

(*) By agreement when ordering phosphorus and sulfur max. contents can be lowered down to 0.025 %

3. SUPERFICIAL APPEARANCE. INTERNAL SOUNDNESS

Wire rods are not to show any internal defect such as cavities, pipes or superficial imperfections such as pits, score marks, laps, cracks.... liable to impair subsequent drawing.

4. INSPECTION

VERIFICATION OF THE CHEMICAL COMPOSITION

All wire rod coils must comply with the requirements specified in Tables I & II.

ANALYSIS METHOD

In case of any difference arising, the analyses are to be proceeded to in accordance with the requirements set forth in the following Standard Specifications

NF A	06-301,	for carbon content determination
NF A	06-302,	for silicon content determination
NF A	06-303,	for manganese content spectrographic determination
NF A	06-304,	for post combustion sulfur content determination
NF A	06-305,	for phosphorus content determination
NF A	06-306,	for copper content electrolytical determination
NF A	06-307,	for nickel content determination
NF A	06-308,	for chromium content determination
NF A	03-111,	for specimen sampling and specimen preparation conditions

Analysis accuracy range for each same sample must fall within the limits hereunder :

— carbon content.....	± 0.01
— manganese content	± 0.02
— silicon content	± 0.02
— phosphorus & sulfur contents	± 0.002.

For all wire rod shipment a ladle analysis certificate is issued.

5. MARKING

Every supplied wire rod coil is to bear the following indications

- name of the supplier
- indication of the grade and of the quality
- heat N°
- wire rod diameter.