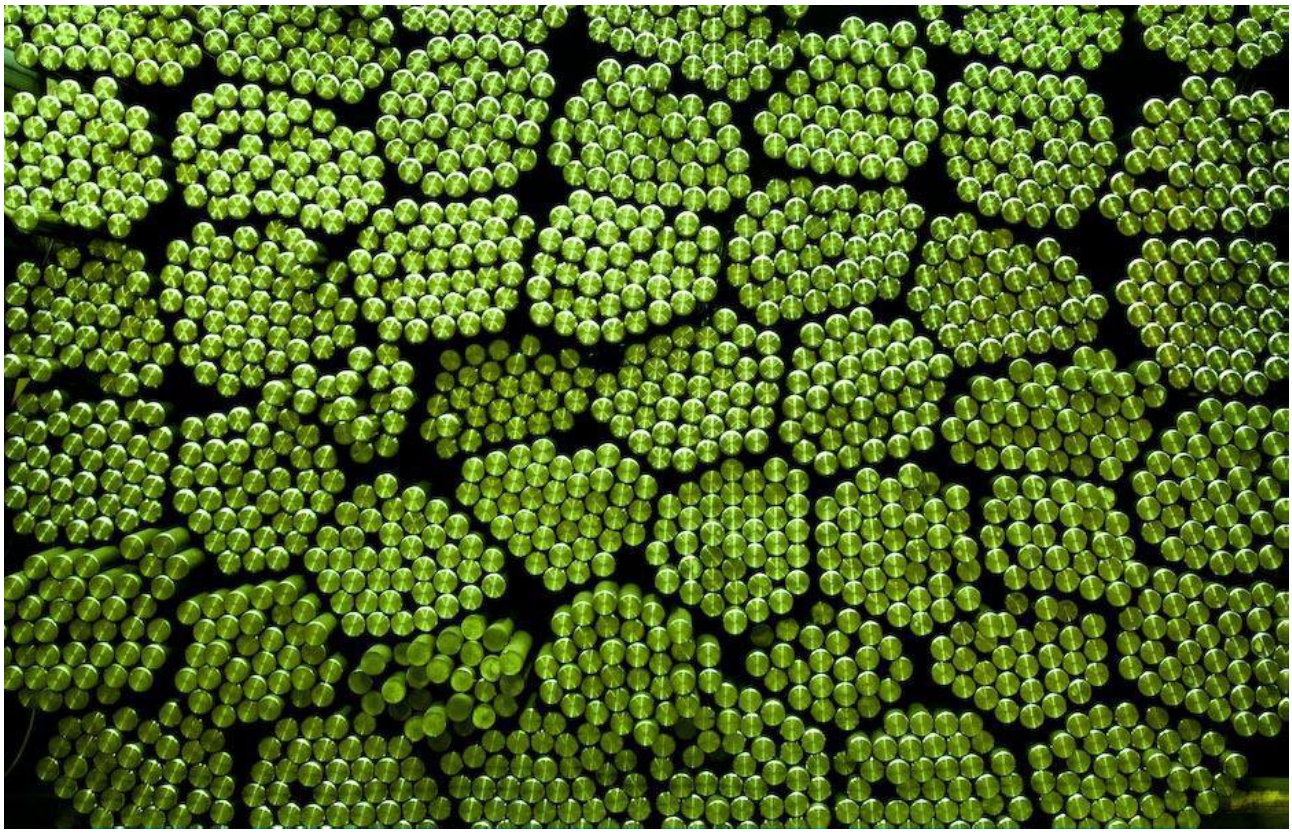

TRAFILERIA
A. MAURI
ACCIAI
SPECIALI

FREE CUTTING STEELS

According to EN 10277:2018

11SMn30
11SMn37
11SMnPb30
11SMnPb37
36SMnPb14
38SMn28
44SMn28
46S20



mauri	**11SMn30** **High machinability steel not destined to heat treatment**	**(W. NR. 1.0715)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-4:2018 standard)

	C %	Si %	Mn %	P %	S %
FROM	-	-	0,90	-	0,27
TO	0,14	0,05	1,30	0,11	0,33

*MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	rolled + peeled rolled (+SH)		Cold drawn (+C)		
	HB hardness max.	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			440	510 - 810	6
>10≤16			410	490 - 760	7
>16≤40	169	380 - 570	375	460 - 710	8
>40≤63	169	370 - 570	305	400 - 650	9
>63≤100	154	360 - 520	245	360 - 630	9

* Delivery condition: as rolled

PROPERTIES :

Machinability:

This steel grade is marked by a good machinability on machine tools and by an easy fragmentation of chips.

Weldability:

Due to the high sulphur and phophorus content free-cutting steels not destined to heat treatment are not generally recommended for welding.

Notes:

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

UNI 4838	**DIN 1651**	**AFNOR 35-561**	**EN 10277-3:2008**	**EN 10087**
CF 9 SMn 28	9SMn28	S 250	11SMn30	11SMn30

mauri	**11SMn37** **High machinability steel not destined to heat treatment**	**(W. NR. 1.0736)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-4:2018 standard)

	C %	Si %	Mn %	P %	S %
FROM	-	-	1,00	-	0,34
TO	0,14	0,05	1,50	0,11	0,40

*MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	Rolled + peeled rolled (+SH)		Cold drawn (+C)		
	HB hardness max.	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			440	510 - 810	6
>10≤16			410	490 - 760	7
>16≤40	169	380 - 570	375	460 - 710	8
>40≤63	169	370 - 570	305	400 - 650	9
>63≤100	154	360 - 520	245	360 - 630	9

* Delivery condition: as rolled

PROPERTIES :

Machinability

This steel grade is marked by a good machinability on machine tools and by an easy fragmentation of chips.

Weldability

Due to the high sulphur and phophorus content free-cutting steels not destined to heat treatment are not generally recommended for welding.

Notes:

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

UNI 4838	**DIN 1651**	**AFNOR 35-561**	**EN 10277-3:2008**	**EN 10087**
CF 9 SMn 36	9SMn36	S 300	11SMn37	11SMn37

mauri	**11SMnPb30** **High machinability steel not destined to heat treatment**	**(W. NR. 1.0718)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-4:2018 standard)

	C %	Si %	Mn %	P %	S %	Pb %
FROM	-	-	0,90	-	0,27	0,20
TO	0,14	0,05	1,30	0,11	0,33	0,35

*MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	rolled + peeled rolled (+SH)		Cold drawn (+C)		
	HB hardness max.	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			440	510 - 810	6
>10≤16			410	490 - 760	7
>16≤40	169	380 - 570	375	460 - 710	8
>40≤63	169	370 - 570	305	400 - 650	9
>63≤100	154	360 - 520	245	360 - 630	9

* Delivery condition: as rolled

PROPERTIES :

Machinability:

This steel grade is marked by a good machinability on machine tools and by an easy fragmentation of chips.
In order to further improve its machinability, this steel grade can be supplied upon request with Te (tellurium) and Bi (bismuth) addition.

Weldability:

Due to the high sulphur and phophorus content free-cutting steels not destined to heat treatment are not generally recommended for welding.

Notes:

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

UNI 4838	**DIN 1651**	**AFNOR 35-561**	**EN 10277-3:2008**	**EN 10087**
CF 9 SMnPb 28	9SMnPb28	S 250 Pb	11SMnPb30	11SMnPb30

mauri	**11SMnPb37** **High machinability steel not destined to heat treatment**	**(W. NR. 1.0737)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-4:2018 standard)

	C %	Si %	Mn %	P %	S %	Pb %
FROM	-	-	1,00	-	0,34	0,20
TO	0,14	0,05	1,50	0,11	0,40	0,35

*MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	rolled + peeled rolled (+SH)		Cold drawn (+C)		
	HB hardness max.	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			440	510 - 810	6
>10≤16			410	490 - 760	7
>16≤40	169	380 - 570	375	460 - 710	8
>40≤63	169	370 - 570	305	400 - 650	9
>63≤100	154	360 - 520	245	360 - 630	9

* Delivery condition: as rolled

PROPERTIES:

Machinability:

This steel grade is marked by a good machinability on machine tools and by an easy fragmentation of chips.
In order to further improve its machinability, this steel grade can be supplied upon request with Te (tellurium) and Bi (bismuth) addition.

Weldability:

Due to the high sulphur and phophorus content free-cutting steels not destined to heat treatment are not generally recommended for welding.

Notes:

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

UNI 4838	**DIN 1651**	**AFNOR 35-561**	**EN 10277-3:2008**	**EN 10087**
CF 9 SMnPb 36	9SMnPb36	S 300 Pb	11SMnPb37	11SMnPb37

mauri	**36SMnPb14** **High machinability steel for direct hardening**	**(W. NR. 1.0765)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-4:2018 standard)

	C %	Si %	Mn %	P %	S %	Pb %
FROM	0,32	-	1,30	-	0,10	0,15
TO	0,39	0,40	1,70	0,06	0,18	0,35

*MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	rolled + peeled rolled (+SH)		Cold drawn (+C)		
	HB hardness max.	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			500	660 - 960	6
>10≤16			440	620 - 920	6
>16≤40	219	560 - 750	390	600 - 900	7
>40≤63	216	560 - 740	360	580 - 840	8
>63≤100	216	550 - 740	340	560 - 820	9

* Delivery condition: as rolled

PROPERTIES :

Machinability

This steel grade generally shows a quite good machinability on machine tools; machinability decreases with the increase of carbon, silicon and manganese content.

Weldability

Due to the high sulphur and phophorus content free-cutting steels for direct hardening are not recommended for welding.

Notes

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

UNI 4838	**AFNOR 35-562**	**EN 10087**	**EN 10277-3:2008**
CF 35 SMnPb 10	35 MF 6 +Pb	36SMnPb14	36SMnPb14

mauri	**38SMn28** **High machinability steel for direct hardening**	**(W. NR. 1.0760)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-4:2018 standard)

	C %	Si %	Mn %	P %	S %
FROM	0,35	-	1,20	-	0,24
TO	0,40	0,40	1,50	0,06	0,33

*MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	rolled + peeled rolled (+SH)		Cold drawn (+C)		
	HB hardness max.	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			550	700 - 960	6
>10≤16			500	660 - 960	6
>16≤40	213	560 - 730	420	610 - 900	7
>40≤63	213	560 - 730	400	600 - 840	7
>63≤100	204	550 - 700	350	580 - 820	8

* Delivery condition: as rolled

PROPERTIES:

Machinability

This steel grade generally shows a quite good machinability on machine tools; machinability decreases with the increase of carbon, silicon and manganese content.

Weldability

Due to the high sulphur and phophorus content free-cutting steels for direct hardening are not recommended for welding.

Notes

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

UNI 4838	AFNOR 35-562	EN 10087	EN 10277-3:2008
/	/	38SMn28	38SMn28

mauri	**44SMn28** **High machinability steel for direct hardening**	**(W. NR. 1.0762)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-4:2018 standard)

	C %	Si %	Mn %	P %	S %
FROM	0,40	-	1,30	-	0,24
TO	0,48	0,40	1,70	0,06	0,33

*MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	rolled + peeled rolled (+SH)		Cold drawn (+C)		
	HB hardness max.	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			600	760 - 1030	5
>10≤16			530	710 - 980	5
>16≤40	241	630 - 820	460	660 - 900	6
>40≤63	231	620 - 790	430	650 - 870	7
>63≤100	228	610 - 780	390	630 - 840	7

* Delivery condition: as rolled

PROPERTIES:

Machinability

This steel grade generally shows a quite good machinability on machine tools; machinability decreases with the increase of carbon, silicon and manganese content.

Weldability

Due to the high sulphur and phophorus content free-cutting steels for direct hardening are not recommended for welding.

Notes

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

UNI 4838	**AFNOR 35-562**	**EN 10277-3:2008**	**EN 10087**
CF 44 SMn 28	45 MF 6.3	44SMn28	44SMn28

mauri	**46S20** **High machinability steel for direct hardening**	**(W. NR. 1.0727)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-4:2018 standard)

	C %	Si %	Mn %	P %	S %
FROM	0,42	-	0,70	-	0,15
TO	0,50	0,40	1,10	0,06	0,25

*MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	rolled + peeled rolled (+SH)		Cold drawn (+C)		
	HB hardness max.	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			570	740 - 980	5
>10≤16			470	690 - 930	6
>16≤40	222	590 - 760	400	640 - 880	7
>40≤63	213	580 - 730	380	610 - 850	8
>63≤100	207	560 - 710	340	580 - 820	8

* Delivery condition: as rolled

PROPERTIES :

Machinability

This steel grade generally shows a quite good machinability on machine tools; machinability decreases with the increase of carbon, silicon and manganese content.

Weldability

Due to the high sulphur and phophorus content free-cutting steels for direct hardening are not recommended for welding.

Notes:

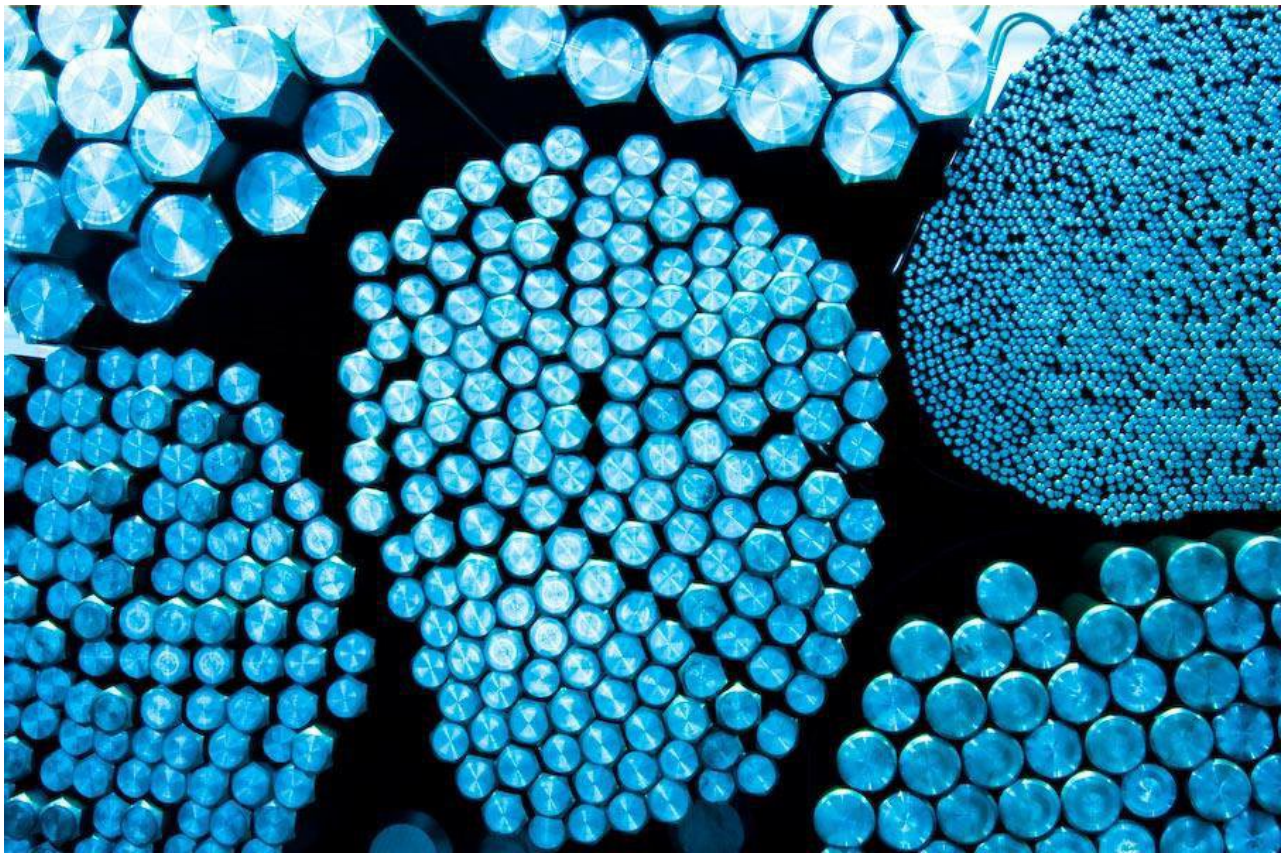
CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

EN 10277-3:2008	**DIN 1651**	**EN 10087**
46S20	45S20	45S20

CASE HARDENING STEELS

According to EN 10277:2018

16MnCr5
16MnCrS5
16NiCrS4Pb
20MnCr5
20MnCrS5
C10E
C10R
C15E
C15R



mauri	**16MnCr5** Special alloy case-hardening steel	**(W. NR. 1.7131)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-3:2022 standard)

	C %	Si %	Mn %	P %	S %	Cr %	Cu%
FROM	0,14	-	1,00	-	-	0,80	-
TO	0,19	0,40	1,30	0,025	0,035	1,10	0,40

*MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	Soft annealed* + peeled rolled (+A +SH)	Soft annealed* + cold drawn (+A+C)
	Hardness maximum values HB	Hardness maximum values HB
≥5≤10	-	260
>10≤16	-	250
>16≤40	207	245
>40≤63	207	240
>63≤100	207	240

* Delivery condition: subjected to a softening treatment according to the maximum hardness prescription.

PROPERTIES :

Weldability:

It is a MnCr alloy steel, easily hot machinable and weldable.

Hardenability:

It has a low hardenability and therefore it can show good core features till thicknesses of about 20 mm.

Notes :

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

UNI 7846	**DIN 17210**	**EN 10084:08**	**AFNOR 35-551**
16MnCr5	16MnCr5	16MnCr5	16MC5

mauri	**16MnCrS5** Special alloy case-hardening steel	**(W. NR. 1.7139)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-3:2022 standard)

	C %	Si %	Mn %	P %	S %	Cr %	Cu%
FROM	0,14	-	1,00	-	0,020	0,80	-
TO	0,19	0,40	1,30	0,025	0,040	1,10	0,40

*MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	Soft annealed* + peeled rolled (+A +SH)	Soft annealed* + cold drawn (+A+C)
	Hardness maximum values HB	Hardness maximum values HB
≥5≤10	-	260
>10≤16	-	250
>16≤40	207	245
>40≤63	207	240
>63≤100	207	240

* Delivery condition: subjected to a softening treatment according to the maximum hardness prescription.

PROPERTIES :

Improved machinability:

Upon request it can be supplied with improved machinability with Pb (lead) addition, for example Pb=0,15%÷0,35%

Weldability:

It is a MnCr alloy steel, easily hot machinable and weldable.

Hardenability:

It has a low hardenability and therefore it can show good core features till thicknesses of about 20 mm.

Notes :

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

UNI 7846	**EN 10084**	**DIN 17210**	**EN 10277-4:2008**	**AFNOR 35-551**
16MnCr5	16MnCrS5	16MnCrS5	16MnCrS5	16MC5

mauri	**16NiCrS4Pb** Special alloy case-hardening steel	**(W. NR. 1.5715)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-3:2022 standard)

	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Pb%	Cu%
FROM	0,13	-	0,70	-	0,020	0,60	0,80	0,15	-
TO	0,19	0,40	1,00	0,025	0,040	1,00	1,10	0,35	0,40

*MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	Soft annealed* + peeled rolled (+A +SH)	Soft annealed* + cold drawn (+A+C)
	Hardness maximum values HB	Hardness maximum values HB
≥5≤10	-	270
>10≤16	-	260
>16≤40	217	255
>40≤63	217	255
>63≤100	217	255

* Delivery condition: subjected to a softening treatment according to the maximum hardness prescription.

PROPERTIES :

Good machinability in the annealed condition and good aptitude / endurance to heat treatment; this steel grade undergoes heat treatment without important deformations.

Hardenability:

It has a low-medium hardenability enabling the use, with good core resistance, till a thickness of about 50 mm.

Notes :

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

UNI 7846	**EN 10084**	**AISI - SAE**	**EN 10277-4:2008**
16CrNi4+Pb	16NiCrS4+Pb	3115	16NiCrS4+Pb

mauri	**20MnCr5** Special alloy case-hardening steel	**(W. NR. 1.7147)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-3:2022 standard)

	C %	Si %	Mn %	P %	S %	Cr %	Cu%
FROM	0,17	-	1,10	-	-	1,00	-
TO	0,22	0,40	1,40	0,025	0,035	1,30	0,40

*MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	Soft annealed* + peeled rolled (+A +SH)	Soft annealed* + cold drawn (+A+C)
	Hardness HB Maximum values	Hardness HB Maximum values
≥5≤10	-	270
>10≤16	-	260
>16≤40	217	255
>40≤63	217	250
>63≤100	217	250

* Delivery condition: subjected to a softening treatment according to the maximum required hardness.

PROPERTIES :

Weldability:

It is a MnCr-alloy steel, easily hot machinable and weldable.

Hardenability:

It has got a quite good hardenability and therefore it can show good core properties till a thickness of about 40 mm.

Notes :

Correspondence with other standards (purely as an indication) :

UNI 7846	EN 10084	DIN 17210	EN 10084:2008	AFNOR 35-551
20MnCr5	20MnCr5	20MnCr5	20MnCr5	20MC5

mauri	**20MnCrS5** Special alloy case-hardening steel	**(W. NR. 1.7149)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-3:2022 standard)

	C %	Si %	Mn %	P %	S %	Cr %	Cu%
FROM	0,17	-	1,10	-	0,020	1,00	-
TO	0,22	0,40	1,40	0,025	0,040	1,30	0,40

*MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	Soft annealed* + peeled rolled (+A +SH)	Soft annealed* + cold drawn (+A+C)
	Hardness HB Maximum values	Hardness HB Maximum values
≥5≤10	-	270
>10≤16	-	260
>16≤40	217	255
>40≤63	217	250
>63≤100	217	250

* Delivery condition: subjected to a softening treatment according to the maximum required hardness.

PROPERTIES :

Weldability:

It is a MnCr-alloy steel, easily hot machinable and weldable.

Hardenability:

It has got a quite good hardenability and therefore it can show good core properties till a thickness of about 40 mm.

Notes :

Correspondence with other standards (purely as an indication) :

UNI 7846	**EN 10084**	**DIN 17210**	**EN 10277-4:2008**	**AFNOR 35-551**
20MnCr5	20MnCrS5	20MnCrS5	20MnCrS5	20MC5

mauri	**C10E** Special non-alloy case-hardening steel	**(W. NR. 1.1121)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-3:2022 standard)

	C %	Si %	Mn %	P %	S %	Cr%	Mo%	Ni%	Cu%
FROM	0,07	-	0,30	-	-	-	-	-	-
TO	0,13	0,40	0,60	0,025	0,035	0,40	0,10	0,40	0,30

*MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	Annealed + drawn (+A+C)	Cold drawn (+C)		
	Hardness HB max.	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % Minimum values
≥5≤10	225	350	460 - 760	8
>10≤16	216	300	430 - 730	9
>16≤40	207	250	400 - 700	10
>40≤63	190	200	350 - 640	12
>63≤100	172	180	320 - 580	12

* Delivery condition: as rolled

PROPERTIES :

Weldability:

It is a soft carbon-steel, easily cold machinable and weldable without any particular precautions.

Improved machinability:

Upon request it can be supplied with improved machinability with Pb (lead) addition, for example Pb=0,15%÷0,35%

Notes:

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication):

UNI 7846	**DIN 17210**	**EN 10084**	**AFNOR 35-551**
C10	CK10	C10E	XC10

mauri	**C10R** Special non-alloy case-hardening steel	**(W. NR. 1.1207)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-3:2022 standard)

	C %	Si %	Mn %	P %	S %	Cr%	Mo%	Ni%	Cu%
FROM	0,07	-	0,30	-	0,020	-	-	-	-
TO	0,13	0,40	0,60	0,025	0,040	0,40	0,10	0,40	0,30

*MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	Annealed + drawn (+A+C)	Cold drawn (+C)		
	Hardness HB max.	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % Minimum values
≥5≤10	225	350	460 - 760	8
>10≤16	216	300	430 - 730	9
>16≤40	207	250	400 - 700	10
>40≤63	190	200	350 - 640	12
>63≤100	172	180	320 - 580	12

* Delivery condition: as rolled

PROPERTIES :

Weldability:

It is a soft carbon-steel, easily cold machinable and weldable without any particular precautions.

Improved machinability:

Upon request it can be supplied with improved machinability with Pb (lead) addition, for example Pb=0,15%÷0,35%

Notes:

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication):

UNI 7846	**DIN 17210**	**EN 10277-4:2008**	**AFNOR 35-551**
C10	CK10	C10R	XC10

mauri	**C15E** Special non-alloy case-hardening steel	**(W. NR. 1.1141)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-3:2022 standard)

	C %	Si %	Mn %	P %	S %	Cr%	Mo%	Ni%	Cu%
FROM	0,12	-	0,30	-	-	-	-	-	-
TO	0,18	0,40	0,60	0,025	0,035	0,40	0,10	0,40	0,30

*MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	Annealed + drawn (+A+C)	Cold drawn (+C)		
	Hardness HB max.	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % Minimum values
≥5≤10	238	380	500 - 800	7
>10≤16	231	340	480 - 780	8
>16≤40	216	280	430 - 730	9
>40≤63	198	240	380 - 670	11
>63≤100	178	215	340 - 600	12

* Delivery condition: as rolled

PROPERTIES :

Weldability:

It is a soft carbon-steel, easily cold machinable and weldable without any particular precautions.

Improved machinability:

Upon request it can be supplied with improved machinability with Pb (lead) addition, for example Pb=0,15%÷0,35%

Notes:

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication):

UNI 7846	**DIN 17210**	**EN 10084**	**AFNOR 35-551**
C15	CK15	C15E	XC12

mauri	**C15R** Special non-alloy case-hardening steel	**(W. NR. 1.1140)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-3:2022 standard)

	C %	Si %	Mn %	P %	S %	Cr%	Mo%	Ni%	Cu%
FROM	0,12	-	0,30	-	0,020	-	-	-	-
TO	0,18	0,40	0,60	0,025	0,040	0,40	0,10	0,40	0,30

*MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	Annealed + drawn (+A+C)	Cold drawn (+C)		
	Hardness HB max.	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % Minimum values
≥5≤10	238	380	500 - 800	7
>10≤16	231	340	480 - 780	8
>16≤40	216	280	430 - 730	9
>40≤63	198	240	380 - 670	11
>63≤100	178	215	340 - 600	12

* Delivery condition: as rolled

PROPERTIES :

Weldability:

It is a soft carbon-steel, easily cold machinable and weldable without any particular precautions.

Improved machinability:

Upon request it can be supplied with improved machinability with Pb (lead) addition, for example Pb=0,15%÷0,35%

Notes:

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication):

UNI 7846	**DIN 17210**	**EN 10277-4:2008**	**AFNOR 35-551**
C15	CK15	C15R	XC12

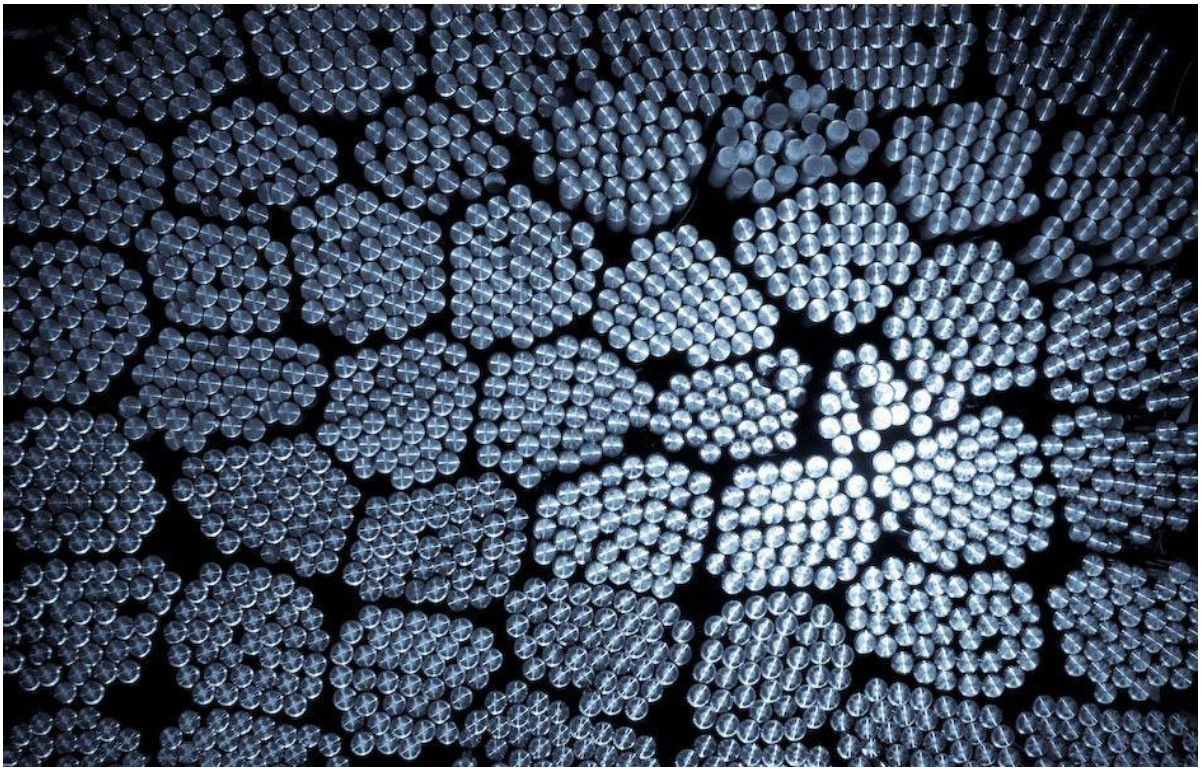
NON ALLOY ENGINEERING STEELS

According to EN 10277:2018
S235JRC
S355J2C

According to EN 10277-2:2008
E295GC
E335GC

According to EN 10025-2:2019
E360
S275JR

According to EN 10277-2:2008
C10
C15



mauri	**S235JRC** Non-alloy steel for structural purposes	**(W. NR. 1.0122)**

CHEMICAL COMPOSITION: (heat analysis according to the EN 10025-2:2019 standard)

	C % For thicknesses in mm ≤16	>16≤40	>40	Si %	Mn %	[1)]P %	S %	N %	Cu %
FROM	-	-	-	-	-	-	-	-	-
TO	0,17	0,17	0,20	-	1,40	0,035	0,035	0,012	0,55

[1)]P and S = max. 0,040% for long products

*MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	Rolled + peeled rolled (+SH)		Cold drawn (+C)		
	hardness HB	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			355	470 - 840	8
>10≤16			300	420 - 770	9
>16≤40	107 – 152	360 - 510	260	390 - 730	10
>40≤63	107 – 152	360 - 510	235	380 - 670	11
>63≤100	107 - 152	360 - 510	215	360 - 640	11

* Delivery condition: as rolled.

PROPERTIES :

Weldability:

This steel grade is generally suitable to welding.

Notes:

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

EN 10025:90 Fe 360 BFN	**DIN 17100** RSt 37-2	**BS 4360** 40B

mauri	**S355J2C** Non-alloy steel for structural purposes	**(W. NR. 1.0579)**

CHEMICAL COMPOSITION: (heat analysis according to the EN 10025-2:2019 standard)

	C % For thicknesses in mm ≤16	>16≤40	>40	Si %	Mn %	[1)]P %	S %	N %	Cu %
FROM	-	-	-	-	-	-	-	-	-
TO	0,20	0,20	0,22	0,55	1,60	0,025	0,025	-	0,55

[1)]P and S = max. 0,030% for long products

*MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	Rolled + peeled rolled (+SH)		Cold drawn (+C)		
	hardness HB	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			520	630 - 950	6
>10≤16			450	580 - 880	7
>16≤40	140 - 187	470 - 630	350	530 - 850	8
>40≤63	140 - 187	470 - 630	335	500 - 770	9
>63≤100	140 - 187	470 - 630	315	470 - 740	9

* Delivery condition: as rolled.

PROPERTIES :

Calculation of the equivalent carbon:

$$CEV = C + \frac{Mn}{6} + \frac{Cr+Mo+V}{5} + \frac{Ni+Cu}{15}$$

Weldability:

This steel grade is generally suitable to welding.

Notes:

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

EN 10277-2:2008	**UNI 7070**	**DIN 17 100**	**BS 4360**
S355J2C	Fe 510 D	St 52-3 N	50 D8

mauri	**E295GC** Non-alloy steel for structural purposes	**(W. NR. 1.0533)**

CHEMICAL COMPOSITION: (heat analysis according to the EN 10277-2:2008 standard)

	C %	Si %	Mn %	P %	S %	N %	Cu %
FROM	-	-	-	-	-	-	-
TO	-	-	-	0,045	0,045	0,012	-

*MECHANICAL FEATURES: (according to the EN 10277-2:2008 standard)

Thickness mm	Rolled + peeled rolled (+SH)		Cold drawn (+C)		
	hardness HB	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			510	650 - 950	6
>10≤16			420	600 - 900	7
>16≤40	140 - 181	470 - 610	320	550 - 850	8
>40≤63	140 - 181	470 - 610	300	520 - 770	9
>63≤100	140 - 181	470 - 610	255	470 - 740	9

* Delivery condition: as rolled.

PROPERTIES:

Weldability:

Failing any prescriptions concerning chemical composition, no technical data about this steel weldability are available.

Notes:

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

EN 10025-2:2004	**EN 10025:90**	**UNI 7070**	**DIN 17 100**	**NF A35-501**
E295	Fe 490-2	Fe 490	St 50-2	A 50-2

mauri	**E335GC** Non-alloy steel for structural purposes	**(W. NR. 1.0543)**

CHEMICAL COMPOSITION: (heat analysis according to the EN 10277-2:2008 standard)

	C %	Si %	Mn %	P %	S %	N %	Cu %
FROM	-	-	-	-	-	-	-
TO	-	-	-	0,045	0,045	0,012	-

*MECHANICAL FEATURES: (according to the EN 10277-2:2008 standard)

Thickness mm	Rolled + peeled rolled (+SH)		Cold drawn (+C)		
	hardness HB	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			540	700 - 1050	5
>10≤16			480	680 - 970	6
>16≤40	169 - 211	570 - 710	390	640 - 930	7
>40≤63	169 - 211	570 - 710	340	620 - 870	8
>63≤100	169 - 211	570 - 710	295	570 - 810	8

* Delivery condition: as rolled.

PROPERTIES:

Weldability:

Failing any prescriptions concerning chemical composition, no technical data about this steel weldability are available.

Notes:

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

EN 10025-2:2004	**EN 10025:90**	**UNI 7070**	**DIN 17 100**	**NF A35-501**
E335	Fe 590-2	Fe 590	St 60-2	A 60-2

mauri	**E360** Non-alloy steel for structural purposes	**(W. NR. 1.0070)**

CHEMICAL COMPOSITION: (heat analysis according to the EN 10025-2:2019 standard)

	C %	Si %	Mn %	P %	S %	N %	Cu %
FROM	-	-	-	-	-	-	-
TO	-	-	-	0,045	0,045	0,012	-

*MECHANICAL FEATURES: there aren't any indications for the drawn products +C

* Delivery condition: as rolled.

PROPERTIES:

Weldability:

Failing any prescriptions concerning chemical composition, no technical data about this steel weldability are available.

Notes:

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

EN 10025-2:2019	**EN 10025:90**	**UNI 7070**	**DIN 17 100**	**NF A35-501**
E360	Fe 690-2	Fe 690	St 70-2	A 70-2

mauri	**S275JR** Non-alloy steel for structural purposes	**(W. NR. 1.0044)**

CHEMICAL COMPOSITION: (heat analysis according to the EN 10025-2:2019 standard)

	C % For thicknesses in mm ≤16	>16 ≤40	>40	Si %	Mn %	[1)]P %	S %	N %	Cu %
FROM	-	-	-	-	-	-	-	-	-
TO	0,21	0,21	0,22	-	1,50	0,035	0,035	0,012	0,55

[1)]P and S = max. 0,040% for long products

*MECHANICAL FEATURES: there aren't any indications for the drawn products +C

* Delivery condition: as rolled.

PROPERTIES :

Weldability:

This steel grade is generally suitable to welding.

Notes:

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

EN 10025:90	**UNI 7070**	**DIN 17 100**	**NF A35-501**
Fe 430 B	Fe 430 B	St 44-2	E 28-2

mauri	**C10** Non-alloy steel for general purposes	**(W. NR. 1.0301)**

CHEMICAL COMPOSITION: (heat analysis according to the EN 10277-2:2008 standard)

	C %	Si %	Mn %	P %	S %
FROM	0,07	-	0,30	-	-
TO	0,13	0,40	0,60	0,045	0,045

*MECHANICAL FEATURES: (according to the EN 10277-2:2008 standard)

Thickness mm	rolled + peeled rolled (+SH)		Cold drawn (+C)		
	hardness HB	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			350	460 - 760	8
>10≤16			300	430 - 730	9
>16≤40	92 - 163	310 - 550	250	400 - 700	10
>40≤63	92 - 163	310 - 550	200	350 - 640	12
>63≤100	92 - 163	310 - 550	180	320 - 580	12

* Delivery condition: as rolled

PROPERTIES :

Weldability:

It is a soft carbon-steel, easily cold machinable and weldable without any particular precautions.

Improved machinability:

Upon request it can be supplied with improved machinability with Pb (lead) addition, for example Pb=0,15%÷0,35%

Notes:

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

UNI 7846	**DIN 17210**	**AFNOR 35-551**
C10	CK10	XC10

mauri	**C15** Non-alloy steel for general purposes	**(W. NR. 1.0401)**

CHEMICAL COMPOSITION: (heat analysis according to the EN 10277-2:2008 standard)

	C %	Si %	Mn %	P %	S %
FROM	0,12	-	0,30	-	-
TO	0,18	0,40	0,80	0,045	0,045

*MECHANICAL FEATURES: (according to the EN 10277-2:2008 standard)

Thickness mm	Rolled + peeled rolled (+SH)		Cold drawn (+C)		
	hardness HB	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			380	500 - 800	7
>10≤16			340	480 - 780	8
>16≤40	98 - 178	330 - 600	280	430 - 730	9
>40≤63	98 - 178	330 - 600	240	380 - 670	11
>63≤100	98 - 178	330 - 600	215	340 - 600	12

* Delivery condition: as rolled

PROPERTIES:

Weldability:

It is a soft carbon-steel, easily cold machinable and weldable without any particular precautions.

Improved machinability:

Upon request it can be supplied with improved machinability with Pb (lead) addition, for example Pb=0,15%÷0,35%

Notes:

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication):

UNI 7846	**DIN 17210**	**AFNOR 35-551**
C15	CK15	XC12

HEAT TREATABLE STEELS

According to EN 10277:2018

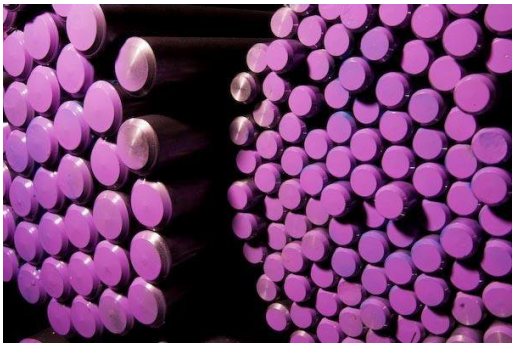
34CrMo4
34CrMoS4
42CrMo4
42CrMoS4
C35
C35E
C35R
C40
C40E
C40R
C45
C45E
C45R
C50
C50E
C50R

According to EN 10083-2:1998

C22

According to EN 10083-2:2006

C22E
C22R



mauri	**34CrMo4** Special alloy steel	**(W.NR. 1.7220)**

CHEMICAL COMPOSITION: (analysis according to the EN ISO 683-2:2018 standard)

	C %	Si %	Mn %	P %	S %	Cr %	Mo %	Cu%
FROM	0,30	0,10	0,60	-	-	0,90	0,15	-
TO	0,37	0,40	0,90	0,025	0,035	1,20	0,30	0,40

* MECHANICAL FEATURES: (according to the EN 10277:2018 standard) not provided for

Thickness mm	annealed + cold drawn (+A+C) hardness HB maximum values
≥5≤10	-
>10≤16	-
>16≤40	-
>40≤100	-

* Delivery condition: soft annealed.

PROPERTIES :

Weldability:

Low weldability; this steel grade can be welded only with suitable precautions.

Hardenability:

Steel grade with medium carbon content showing a poor hardenability; sensitive to notching and to quenching cracks.

Notes :

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

UNI 7845	**DIN 17200**	**AFNOR 35-552**	**AISI-SAE**
35CrMo4	34CrMo4	34CD4	4135

mauri	**34CrMoS4** Special alloy steel	**(W.NR. 1.7226)**

CHEMICAL COMPOSITION: (analysis according to the EN ISO 683-2:2018 standard)

	C %	Si %	Mn %	P %	S %	Cr %	Mo %	Cu%
FROM	0,30	0,10	0,60	-	0,020	0,90	0,15	-
TO	0,37	0,40	0,90	0,025	0,040	1,20	0,30	0,40

* MECHANICAL FEATURES: (according to the EN 10277:2018 standard) not provided for

Thickness mm	annealed + cold drawn (+A+C) hardness HB maximum values
≥5≤10	-
>10≤16	-
>16≤40	-
>40≤100	-

* Delivery condition: soft annealed.

PROPERTIES :

Weldability:

Low weldability; this steel grade can be welded only with suitable precautions.

Hardenability:

Steel grade with medium carbon content showing a poor hardenability; sensitive to notching and to quenching cracks.

Notes :

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

UNI 7845	**DIN 17200**	**AFNOR 35-552**	**AISI-SAE**
35CrMo4	34CrMoS4	34CD4u	4135

mauri	**42CrMo4** Special alloy steel	**(W.NR. 1.7225)**

CHEMICAL COMPOSITION: (analysis according to the EN ISO 683-2:2018 standard)

	C %	Si %	Mn %	P %	S %	Cr %	Mo %	Cu%
FROM	0,38	0,10	0,60	-	-	0,90	0,15	-
TO	0,45	0,40	0,90	0,025	0,035	1,20	0,30	0,40

* MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	Annealed + cold drawn (+A+C) hardness HB maximum values
≥5≤10	300
>10≤16	290
>16≤40	285
>40≤63	280
>63≤100	280

* Delivery condition: soft annealed.

PROPERTIES :

Weldability:

Bad weldability due to the high crack danger.

Hardenability:

Medium-good hardenability, suitable for hot purposes till a temperature of 500°.
It can be hardened in oil.

Notes :

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

UNI 7845	**DIN 17200**	**AFNOR 35-552**	**AISI-SAE**
42CrMo4	42CrMo4	42CD4	4140

mauri	**42CrMoS4** Special alloy steel	**(W.NR. 1.7227)**

CHEMICAL COMPOSITION: (analysis according to the EN ISO 683-2:2018 standard)

	C %	Si %	Mn %	P %	S %	Cr %	Mo %	Cu%
FROM	0,38	0,10	0,60	-	0,020	0,90	0,15	-
TO	0,45	0,40	0,90	0,025	0,040	1,20	0,30	0,40

* MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	annealed + cold drawn (+A+C) hardness HB maximum values
≥5≤10	300
>10≤16	290
>16≤40	285
>40≤63	280
>63≤100	280

* Delivery condition: soft annealed.

PROPERTIES :

Weldability:

Bad weldability due to the high crack danger.

Hardenability:

Medium-good hardenability, suitable for hot purposes till a temperature of 500°.
It can be hardened in oil.

Notes :

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

UNI 7845	**DIN 17200**	**AFNOR 35-552**	**AISI-SAE**
42CrMo4	42CrMoS4	42CD4u	4140

mauri	**C35** Non-alloy high grade steel	**(W. NR. 1.0501)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-1:2018 standard)

	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Cu%	Cr+Mo+Ni %
FROM	0,32	0,10	0,50	-	-	-	-	-	-	-
TO	0,39	0,40	0,80	0,045	0,045	0,40	0,40	0,10	0,30	0,63

* MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	Rolled + peeled rolled (+SH)		Cold drawn (+C)		
	hardness HB	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			510	650 - 1000	6
>10≤16			420	600 - 950	7
>16≤40	156 – 204	520 - 700	320	580 - 880	8
>40≤63	156 – 204	520 - 700	300	550 - 840	9
>63≤100	156 - 204	520 - 700	270	520 - 800	9

* Delivery condition: as rolled.

PROPERTIES :

Improved machinability:

In order to improve its machinability, this steel grade can be supplied upon request with Pb (lead) addition, for example Pb=0,15%÷0,35%

Weldability:

It can be welded quite well without any precautions.

Hardenability:

Low hardenability; core quenching in water till a diameter of 12-15 mm; as far as bigger diameters are concerned, it hardens only till a certain depth, inversely proportional to diameter, like all non-alloy steels with medium-high carbon content.

Notes :

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

UNI 7845	**DIN 17200**	**AISI-SAE**	**AFNOR 35-552**
C35	C35	1035	AF55C35

mauri	**C35E** Non-alloy special steel	**(W. NR. 1.1181)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-1:2018 standard)

	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Cu%	Cr+Mo+Ni %
FROM	0,32	0,10	0,50	-	-	-	-	-	-	-
TO	0,39	0,40	0,80	0,025	0,035	0,40	0,40	0,10	0,30	0,63

* MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	Rolled + peeled rolled (+SH)		Cold drawn (+C)		
	hardness HB	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			510	650 - 1000	6
>10≤16			420	600 - 950	7
>16≤40	156 - 204	520 - 700	320	580 - 880	8
>40≤63	156 - 204	520 - 700	300	550 - 840	9
>63≤100	156 - 204	520 - 700	270	520 - 800	9

* Delivery condition: as rolled.

PROPERTIES :

Weldability:

It can be welded quite well without any precautions.

Hardenability:

Low hardenability; core quenching in water till a diameter of 12-15 mm; as far as bigger diameters are concerned, it hardens only till a certain depth, inversely proportional to diameter, like all non-alloy steels with medium-high carbon content.

Notes :

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

UNI 7845	**DIN 17200**	**AISI-SAE**	**AFNOR 35-552**
C35	CK35	1035	XC38H1

mauri	**C35R** Non-alloy special steel	**(W. NR. 1.1180)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-1:2018 standard)

	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Cu%	Cr+Mo+Ni %
FROM	0,32	0,10	0,50	-	0,020	-	-	-	-	-
TO	0,39	0,40	0,80	0,025	0,040	0,40	0,40	0,10	0,30	0,63

* MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	Rolled + peeled rolled (+SH)		Cold drawn (+C)		
	hardness HB	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			510	650 - 1000	6
>10≤16			420	600 - 950	7
>16≤40	156 – 204	520 - 700	320	580 - 880	8
>40≤63	156 – 204	520 - 700	300	550 - 840	9
>63≤100	156 - 204	520 - 700	270	520 - 800	9

* Delivery condition: as rolled.

PROPERTIES :

Weldability:

It can be welded quite well without any precautions.

Hardenability:

Low hardenability; core quenching in water till a diameter of 12-15 mm; as far as bigger diameters are concerned, it hardens only till a certain depth, inversely proportional to diameter, like all non-alloy steels with medium-high carbon content.

Notes :

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

UNI 7845	**DIN 17200**	**AISI-SAE**	**AFNOR 35-552**
C35	Cm35	1035	XC38H1u

mauri	**C40** Non-alloy high grade steel	**(W. NR. 1.0511)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-1:2018 standard)

	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Cu%	Cr+Mo+Ni %
FROM	0,37	0,10	0,50	-	-	-	-	-	-	-
TO	0,44	0,40	0,80	0,045	0,045	0,40	0,40	0,10	0,30	0,63

* MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	Rolled + peeled rolled (+SH)		Cold drawn (+C)		
	hardness HB	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			540	700 - 1000	6
>10≤16			460	650 - 980	7
>16≤40	164 - 207	550 - 710	365	620 - 920	8
>40≤63	164 – 207	550 - 710	330	590 - 840	9
>63≤100	164 - 207	550 - 710	290	550 - 820	9

* Delivery condition: as rolled.

PROPERTIES :

Improved machinability:

In order to improve its machinability, this steel grade can be supplied upon request with Pb (lead) addition, for example Pb=0,15%÷0,35%

Weldability:

Due to the medium-high carbon content it can be welded with some precautions.

Hardenability:

Low hardenability; it shows intermediate features between those of steels with medium and those of steels with high carbon content; therefore it is not easy to obtain the required features by quenching in oil and the quenching in water can result in cracking.

Notes:

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

UNI 7845	**DIN 17200**	**AISI-SAE**	**AFNOR 35-552**
C40	C40	1040	AF60C40

mauri	**C40E** Non-alloy special steel	**(W. NR. 1.1186)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-1:2018 standard)

	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Cu%	Cr+Mo+Ni %
FROM	0,37	0,10	0,50	-	-	-	-	-	-	-
TO	0,44	0,40	0,80	0,025	0,035	0,40	0,40	0,10	0,30	0,63

* MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	Rolled + peeled rolled (+SH)		Cold drawn (+C)		
	hardness HB	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			540	700 - 1000	6
>10≤16			460	650 - 980	7
>16≤40	164 – 207	550 - 710	365	620 - 920	8
>40≤63	164 – 207	550 - 710	330	590 - 840	9
>63≤100	164 - 207	550 - 710	290	550 - 820	9

* Delivery condition: as rolled.

PROPERTIES :

Weldability:

Due to the medium-high carbon content it can be welded with some precautions.

Hardenability:

Low hardenability; it shows intermediate features between those of steels with medium and those of steels with high carbon content; therefore it is not easy to obtain the required features by quenching in oil and the quenching in water can result in cracking.

Notes:

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

UNI 7845	**DIN 17200**	**AISI-SAE**	**AFNOR 35-552**
C40	Ck40	1040	XC42H1

mauri	**C40R** Non-alloy special steel	**(W. NR. 1.1189)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-1:2018 standard)

	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Cu%	Cr+Mo+Ni %
FROM	0,37	0,10	0,50	-	0,020	-	-	-	-	-
TO	0,44	0,40	0,80	0,025	0,040	0,40	0,40	0,10	0,30	0,63

* MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	Rolled + peeled rolled (+SH)		Cold drawn (+C)		
	hardness HB	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			540	700 - 1000	6
>10≤16			460	650 - 980	7
>16≤40	164 – 207	550 - 710	365	620 - 920	8
>40≤63	164 – 207	550 - 710	330	590 - 840	9
>63≤100	164 - 207	550 - 710	290	550 - 820	9

* Delivery condition: as rolled.

PROPERTIES :

Weldability:

Due to the medium-high carbon content it can be welded with some precautions.

Hardenability:

Low hardenability; it shows intermediate features between those of steels with medium and those of steels with high carbon content; therefore it is not easy to obtain the required features by quenching in oil and the quenching in water can result in cracking.

Notes:

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

UNI 7845	**DIN 17200**	**AISI-SAE**	**AFNOR 35-552**
C40	Cm40	1040	XC42H1u

mauri	**C45** Non-alloy high-grade steel	**(W. NR. 1.0503)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-1:2018 standard)

	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Cu%	Cr+Mo+Ni %
FROM	0,42	0,10	0,50	-	-	-	-	-	-	-
TO	0,50	0,40	0,80	0,045	0,045	0,40	0,40	0,10	0,30	0,63

* MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	Rolled + peeled rolled (+SH)		Cold drawn (+C)		
	hardness HB	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			565	750 - 1050	5
>10≤16			500	710 - 1030	6
>16≤40	172 – 241	580 - 820	410	650 - 1000	7
>40≤63	172 – 241	580 - 820	360	630 - 900	8
>63≤100	172 - 241	580 - 820	310	580 - 850	8

* Delivery condition: as rolled.

PROPERTIES :

Improved machinability:

In order to improve its machinability, this steel grade can be supplied upon request with Pb (lead) addition, for example Pb=0,15%÷0,35%

Weldability:

Due to the medium-high carbon content it can be welded with some precautions.

Hardenability:

It has a low hardenability in water or oil; fit for surface hardening that gives this steel grade a high hardness of the hardened shell.

Notes :

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

UNI 7845	**DIN 17200**	**AISI-SAE**	**AFNOR 35-552**
C45	C45	1045	AF65C45

mauri	**C45E** Non-alloy special steel	**(W. NR. 1.1191)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-1:2018 standard)

	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Cu%	Cr+Mo+Ni %
FROM	0,42	0,10	0,50	-	-	-	-	-	-	-
TO	0,50	0,40	0,80	0,025	0,035	0,40	0,40	0,10	0,30	0,63

* MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	Rolled + peeled rolled (+SH)		Cold drawn (+C)		
	hardness HB	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			565	750 - 1050	5
>10≤16			500	710 - 1030	6
>16≤40	172 – 241	580 - 820	410	650 - 1000	7
>40≤63	172 – 241	580 - 820	360	630 - 900	8
>63≤100	172 - 241	580 - 820	310	580 - 850	8

* Delivery condition: as rolled.

PROPERTIES :

Weldability:

Due to the medium-high carbon content it can be welded with some precautions.

Hardenability:

It has a low hardenability in water or oil; fit for surface hardening that gives this steel grade a high hardness of the hardened shell.

Notes :

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

UNI 7845	**DIN 17200**	**AISI-SAE**	**AFNOR 35-552**
C45	Ck45	1045	XC48H1

mauri	**C45R** Non-alloy special steel	**(W. NR. 1.1201)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-1:2018 standard)

	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Cu%	Cr+Mo+Ni %
FROM	0,42	0,10	0,50	-	0,020	-	-	-	-	-
TO	0,50	0,40	0,80	0,025	0,040	0,40	0,40	0,10	0,30	0,63

* MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	Rolled + peeled rolled (+SH)		Cold drawn (+C)		
	hardness HB	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			565	750 - 1050	5
>10≤16			500	710 - 1030	6
>16≤40	172 – 241	580 - 820	410	650 - 1000	7
>40≤63	172 – 241	580 - 820	360	630 - 900	8
>63≤100	172 - 241	580 - 820	310	580 - 850	8

* Delivery condition: as rolled.

PROPERTIES :

Weldability:

Due to the medium-high carbon content it can be welded with some precautions.

Hardenability:

It has a low hardenability in water or oil; fit for surface hardening that gives this steel grade a high hardness of the hardened shell.

Notes :

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

UNI 7845	**DIN 17200**	**AISI-SAE**	**AFNOR 35-552**
C45	Cm45	1045	XC48H1u

mauri	**C50** Non-alloy high grade steel	**(W. NR. 1.0540)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-1:2018 standard)

	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Cu%	Cr+Mo+Ni %
FROM	0,47	0,10	0,60	-	-	-	-	-	-	-
TO	0,55	0,40	0,90	0,045	0,045	0,40	0,40	0,10	0,30	0,63

* MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	Rolled + peeled rolled (+SH)		Cold drawn (+C)		
	hardness HB	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			590	770 - 1100	5
>10≤16			520	730 - 1080	6
>16≤40	179 - 269	610 - 910	440	690 - 1050	7
>40≤63	179 - 269	610 - 910	390	650 - 1030	8
>63≤100	179 - 269	610 - 910	-	-	-

* Delivery condition: as rolled.

PROPERTIES :

Weldability:

Not weldable. It can be welded only with particular precautions. It has a bad machinability.

Hardenability:

It has a low hardenability in water or oil; fit for surface hardening that gives this steel grade a high hardness of the hardened shell.

Notes :

CORRESPONDENCE WITH THE OTHER STANDARDS (purely as an indication) :

UNI 7845	**DIN 17200**	**AISI-SAE**
C50	C50	1050

mauri	**C50E** Non-alloy special steel	**(W. NR. 1.1206)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-1:2018 standard)

	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Cu%	Cr+Mo+Ni %
FROM	0,47	0,10	0,60	-	-	-	-	-	-	-
TO	0,55	0,40	0,90	0,025	0,035	0,40	0,40	0,10	0,30	0,63

* MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	Rolled + peeled rolled (+SH)		Cold drawn (+C)		
	hardness HB	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			590	770 - 1100	5
>10≤16			520	730 - 1080	6
>16≤40	179 - 269	610 - 910	440	690 - 1050	7
>40≤63	179 - 269	610 - 910	390	650 - 1030	8
>63≤100	179 - 269	610 - 910	-	-	-

* Delivery condition: as rolled.

PROPERTIES :

Weldability:

Not weldable. It can be welded only with particular precautions. It has a bad machinability.

Hardenability:

It has a low hardenability in water or oil; fit for surface hardening that gives this steel grade a high hardness of the hardened shell.

Notes :

CORRESPONDENCE WITH THE OTHER STANDARDS (purely as an indication) :

UNI 7845	**DIN 17200**	**AISI-SAE**
C50	Ck50	1050

mauri	**C50R** Non-alloy special steel	**(W. NR. 1.1241)**

CHEMICAL COMPOSITION: (heat analysis according to the EN ISO 683-1:2018 standard)

	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Cu%	Cr+Mo+Ni %
FROM	0,47	0,10	0,60	-	0,020	-	-	-	-	-
TO	0,55	0,40	0,90	0,025	0,040	0,40	0,40	0,10	0,30	0,63

* MECHANICAL FEATURES: (according to the EN 10277:2018 standard)

Thickness mm	Rolled + peeled rolled (+SH)		Cold drawn (+C)		
	hardness HB	Rm (MPa)	$Rp_{0,2}$ minimum values (MPa)	Rm (MPa)	A_5 % minimum values
≥5≤10			590	770 - 1100	5
>10≤16			520	730 - 1080	6
>16≤40	179 - 269	610 - 910	440	690 - 1050	7
>40≤63	179 - 269	610 - 910	390	650 - 1030	8
>63≤100	179 - 269	610 - 910	-	-	-

* Delivery condition: as rolled.

PROPERTIES :

Weldability:

Not weldable. It can be welded only with particular precautions. It has a bad machinability.

Hardenability:

It has a low hardenability in water or oil; fit for surface hardening that gives this steel grade a high hardness of the hardened shell.

Notes :

CORRESPONDENCE WITH THE OTHER STANDARDS (purely as an indication) :

UNI 7845	**DIN 17200**	**AISI-SAE**
C50	Cm50	1050

mauri	**C22** Non-alloy high grade steel	**(W. NR. 1.0402)**

CHEMICAL COMPOSITION: (heat analysis according to the EN 10083-2:1998 standard)

	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Cr+Mo+Ni %
FROM	0,17	-	0,40	-	-	-	-	-	-
TO	0,24	0,40	0,70	0,045	0,045	0,40	0,40	0,10	0,63

* MECHANICAL FEATURES: there aren't any indications for drawn products +C

* Delivery condition: as rolled.

PROPERTIES' :

Semi-hard, tough carbon-steel, easily machinable by cold-strain.

Weldability:

Easily weldable.

Hardenability:

Extremely low hardenability, used above all for pieces of small section and when deformations due to water-quenching are allowed.

Notes :

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

DIN 17200 C22

mauri	**C22E** Non-alloy special steel	**(W. NR. 1.1151)**

CHEMICAL COMPOSITION: (heat analysis according to the EN 10083-2:2006 standard)

	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Cr+Mo+Ni %
FROM	0,17	-	0,40	-	-	-	-	-	-
TO	0,24	0,40	0,70	0,030	0,035	0,40	0,40	0,10	0,63

* MECHANICAL FEATURES: there aren't any indications for drawn products +C

* Delivery condition: as rolled.

PROPERTIES :

Semi-hard, tough carbon-steel, easily machinable by cold-strain.

Weldability:

Easily weldable.

Hardenability:

Extremely low hardenability, used above all for pieces of small section and when deformations due to water-quenching are allowed.

Notes :

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

DIN 17200	**AFNOR 35-551**
CK22	XC18

mauri	**C22R** Non-alloy special steel	**(W. NR. 1.1149)**

CHEMICAL COMPOSITION: (heat analysis according to the EN 10083-2:2006 standard)

	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Cr+Mo+Ni %
FROM	0,17	-	0,40	-	0,020	-	-	-	-
TO	0,24	0,40	0,70	0,030	0,040	0,40	0,40	0,10	0,63

*MECHANICAL FEATURES: there aren't any indications for drawn products +C

* Delivery condition: as rolled.

PROPERTIES :

Semi-hard, tough carbon-steel, easily machinable by cold-strain.

Weldability:

Easily weldable.

Hardenability:

Extremely low hardenability, used above all for pieces of small section and when deformations due to water-quenching are allowed.

Notes :

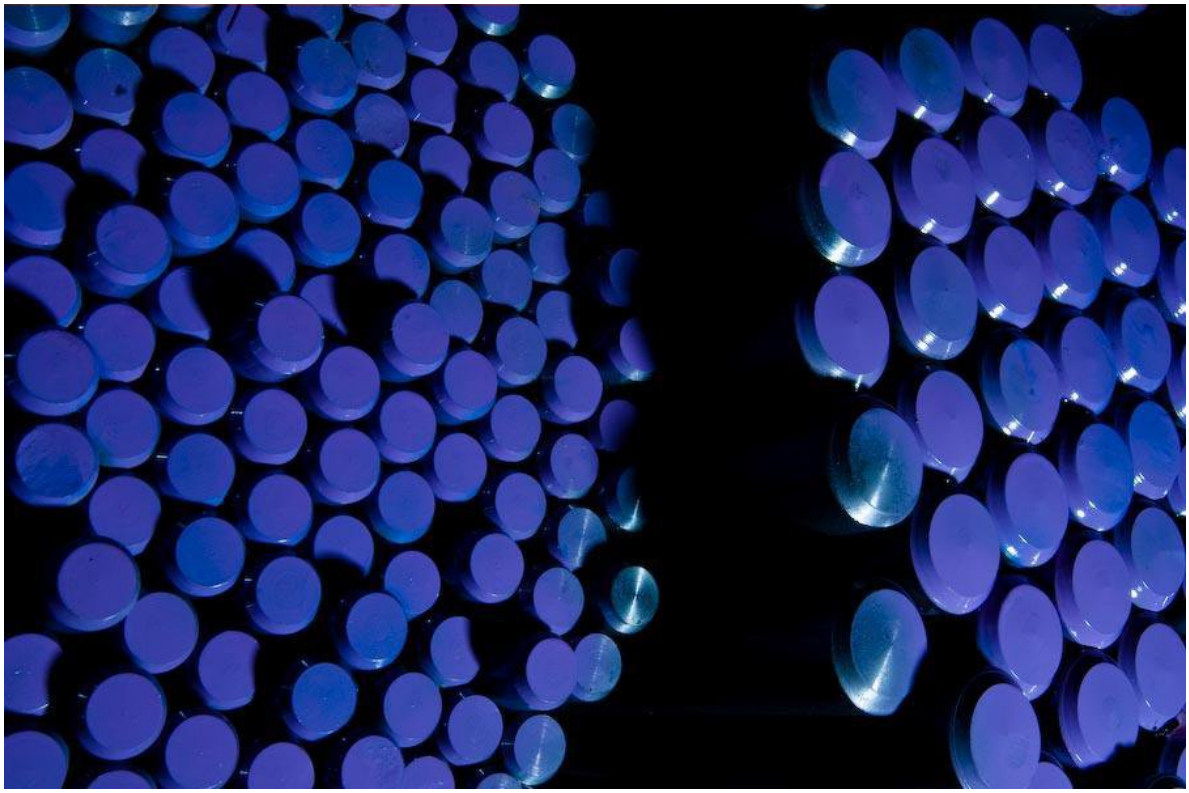
CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

DIN 17200	**AFNOR 35-551**
Cm22	XC18u

BALL BEARING STEELS

According to ISO 683-17:2014

100Cr6



mauri	**100Cr6** Ball bearing steel	**(W.NR. 1.3505)**

CHEMICAL COMPOSITION: (analysis according to the ISO 683-17:2014 standard)

	C %	Si %	Mn %	P %	[1)]S %	Cr %	Mo %	Al %	Cu %	O %
FROM	0,93	0,15	0,25	-	-	1,35	-	-	-	-
TO	1,05	0,35	0,45	0,025	0,015	1,60	0,10	0,050	0,30	0,0015

[1)] In the cases where machinability is of primary importance, a maximum sulphur content S=0,030% can be agreed.

* MECHANICAL FEATURES: (according to the ISO 683-17:2014 standard)

Spheroidized annealed + cold drawn (+AC+C)
hardness HBW maximum value
241[a) b)]

[a)] Hardness for cold drawn products with a diameter < 13 mm can be < 320 HBW
[b)] Upon request it can be supplied with mechanical features differing from those indicated in the standard.

PROPERTIES :

Strain strength and resistance to wear :

This steel grade is generally destined to applications in which a high strain strength and a high resistance to wear under high alternate loads are required. Therefore its main components must have a high hardness, a high elastic limit and a high fatigue strength.

Hardenability:

Good hardenability; hardening must allow quenching in oil to reduce to the minimum the risk of hardening cracks or distortions and to minimize the subsequent grinding operations.

Notes :

CORRESPONDENCE WITH OTHER STANDARDS (purely as an indication) :

UNI 3097	**DIN 17230**	**AISI/SAE**	**AFNOR 35-565**
100Cr6	100Cr6	52100	100C6