STEEL | 2024

TECHNICAL OVERVIEW

COMESA

COMESA s.r.l.
COSTRUZIONI MECCANICHE SALICETO

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Company with Quality Management System
Certified ISO 9001. Cert. N. 50 100 3292

STEEL

ELEMENTS

CARBON

It's the most important constituent of steel. Increasing carbon content increases hardness, tensile strength, wear resistance and improves hardenability. But it also increases brittleness and reduces ductility and toughness.

CHROMIUM

Increases tensile strength, hardness, hardenability, toughness, resistance to wear, corrosion and scaling at elevated temperatures.

MOLYBDENUM

Increases tensile strength, particularly at high temperatures, corrosion resistance and toughness. It also increases the hardenability by lowering the required quench rate during heat treatment, and keeps small the austenitic grain size helping to reach a fine martensitic structure.

NICKEL

Increases tensile strength, toughness and impact strength. It also increases resistance to oxidation and corrosion, also at high temperatures.

VANADIUM

Increases yield strength and elongation, improving the steel toughness and impact strength. It promotes a fine grain structure after heat treatment. It also increases wear resistance and tensile strength, especially at high temperatures.

DEFINITIONS

DUCTILITY	Measure of a steel's ability to undergo significant plastic deformation before rupture or breaking.
ELONGATION	Deformation that occurs before a material eventually breaks when subjected to a tensile load.
HARDENABILITY	The property that determines the depth and distribution of hardness induced by quenching.
IMPACT STRENGTH	The ability of the material to withstand a suddenly applied load.
TENSILE STRENGTH	Maximum stress that a material can withstand while being stretched or pulled before breaking.
TOUGHNESS	The ability of a steel to absorb energy and plastically deform without fracturing.
YIELD POINT	On a stress-strain curve, it's the point that indicates the limit of elastic deformation and the beginning of plastic deformation.

HARDNESS CONVERSION TABLE

Rm (N/mm²)	HB	HV	LE	LD	HRC	HS	Shore C
790	242	258	503	528	23	37,7	34
810	248	264	508	534	24	38,5	35
830	254	270	514	540	25	39,3	36
850	260	277	519	546	26	40,0	37
860	264	281	525	552	27	40,9	38
890	272	289	531	560	28	41,7	39
910	280	297	536	566	29	42,7	40
940	288	305	542	572	30	43,6	41
960	296	313	548	578	31	44,6	42
980	300	317	554	584	32	45,5	43
1010	308	325	561	592	33	46,6	44
1040	316	333	567	598	34	47,6	45
1070	328	345	573	606	35	48,6	46
1100	336	354	580	612	36	49,6	47
1130	344	362	587	620	37	50,6	48
1170	356	374	594	628	38	51,6	49
1200	364	382	601	634	39	52,7	50
1240	376	394	608	642	40	53,8	52
1280	388	407	615	650	41	54,9	53
1320	400	420	622	658	42	55,9	55
1360	410	431	630	664	43	56,8	56
1390	420	442	637	672	44	58,0	57
1440	432	455	646	680	45	59,3	59

Rm (N/mm²)	HB	HV	LE	LD	HRC	HS	Shore C
1500	448	473	653	688	46	60,5	61
1540	456	482	662	696	47	61,8	62
1600	472	500	669	704	48	63,0	64
1650	484	512	676	711	49	64,2	65
1710	496	528	684	720	50	65,8	67
1770		542	694	730	51	67,0	69
1810		555	703	739	52	68,8	70
1900		575	711	746	53	70,0	72
1960		590	720	755	54	71,6	73
2060		610	731	761	55	73,4	75
2160		630	738	768	56	74,7	76
		650	748	780	57	76,0	78
		670	756	790	58	77,6	80
		690	765	797	59	79,6	82
		720	776	811	60	81,6	84
		740	786	822	61	83,5	86
		760	795	831	62	85,4	87
		790	805	841	63	87,2	89
		810	814	850	64	89,0	91
		840	823	860	65	90,7	93
		870	832	868	66	93,2	96
		910	843	879	67	95,6	98
		970	855	890	68	98,0	100

TECHNICAL **OVERVIEW**

CLASS: STEEL

DENOMINATION: **50CrV4**

CORRESPONDENCES

DIN	W. NO.	SIAU
50CrV4	1.8159	KVR

AISI/SAE	BS	
6150	735A50 / EN47	

CHEMICAL COMPOSITION in Weight %

C	Si	Mn	Cr
0.47-0.55	≤ 0.40	0.70-1.10	0.90-1.20

V	S	P	
0.10-0.25	≤ 0.035	≤ 0.035	

GENERAL INFORMATIONS

DESCRIPTION
Low alloyed cold working steel

APPLICATIONS
Cold working levelling rolls,

straightening rolls

MECHANICAL PROPERTIES
Tensile Strength: Rm = 900-1250 N/mm²

Yield Strength: Rs min. 700 N/mm²

Elongation A min. (%) 12

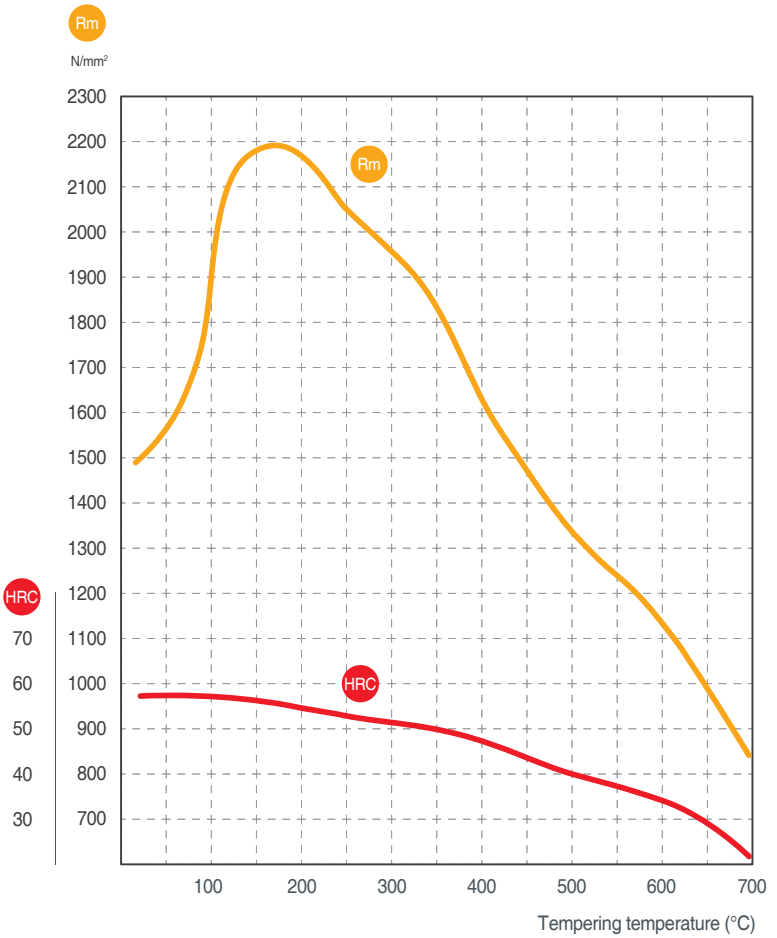
REDUCTION RATIO
Min. 4:1

INCLUSIONS
According ASTM E45 st. D

Accepted type A, B, C, D, max 2,0 T – max 1,5 H

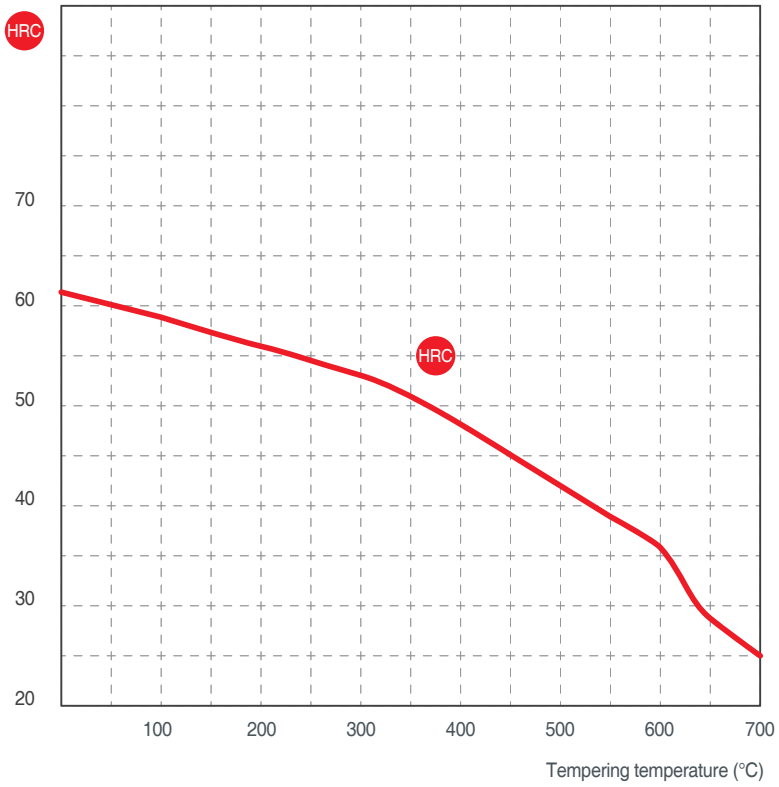
AUSTENITIC GRAIN
According ASTM E112 ≥ 5

ULTRASONIC TEST
According SEP 1921, acceptability class D/d



TECHNICAL **OVERVIEW**

CLASS	DENOMINATION
STEEL	**50CrMo4**



CORRESPONDENCES

DIN	W. NO.	SIAU
50CrMo4	1.7228	---

AISI/SAE	BS	
4150	708M50	

CHEMICAL COMPOSITION in Weight %

C	Si	Mn	Cr
0.46-0.54	≤0.40	0.50-0.80	0.90-1.20

Mo	S	P	
0.15-0.30	≤ 0.035	≤ 0.035	

GENERAL INFORMATIONS

DESCRIPTION
Low alloyed cold working steel

APPLICATIONS
Cold working levelling rolls, straightening rolls, slitting shafts

MECHANICAL PROPERTIES
Tensile Strength: Rm = 900-1250 N/mm²

Yield Strength: Rs min. 700 N/mm²

Elongation A min. (%) 12

REDUCTION RATIO
Min. 4:1

INCLUSIONS
According ASTM E45 st. D

Accepted type A, B, C, D, max 2,0 T – max 1,5 H

AUSTENITIC GRAIN
According ASTM E112 ≥ 5

ULTRASONIC TEST
According SEP 1921, acceptability class D/d

CORRESPONDENCES

DIN	W. NO.	SIAU
51CrMoV4	1.7701	---

AISI/SAE	BS	
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CHEMICAL COMPOSITION in Weight %:

C	Si	Mn	Cr
0.48-0.56	0.15-0.40	0.70-1.10	0.90-1.20

Mo	V	S	P
0.15-0.25	0.08-0.15	≤ 0.030	≤ 0.030

GENERAL INFORMATIONS

DESCRIPTION
Low alloyed cold working steel

APPLICATIONS
Cold working levelling rolls,

straightening rolls

MECHANICAL PROPERTIES
Tensile Strength: Rm = 900-1250 N/mm²

Yield Strength: Rs min. 700 N/mm²

Elongation A min. (%) 12

REDUCTION RATIO
Min. 4:1

INCLUSIONS
According ASTM E45 st. D

Accepted type A, B, C, D, max 2,0 T – max 1,5 H

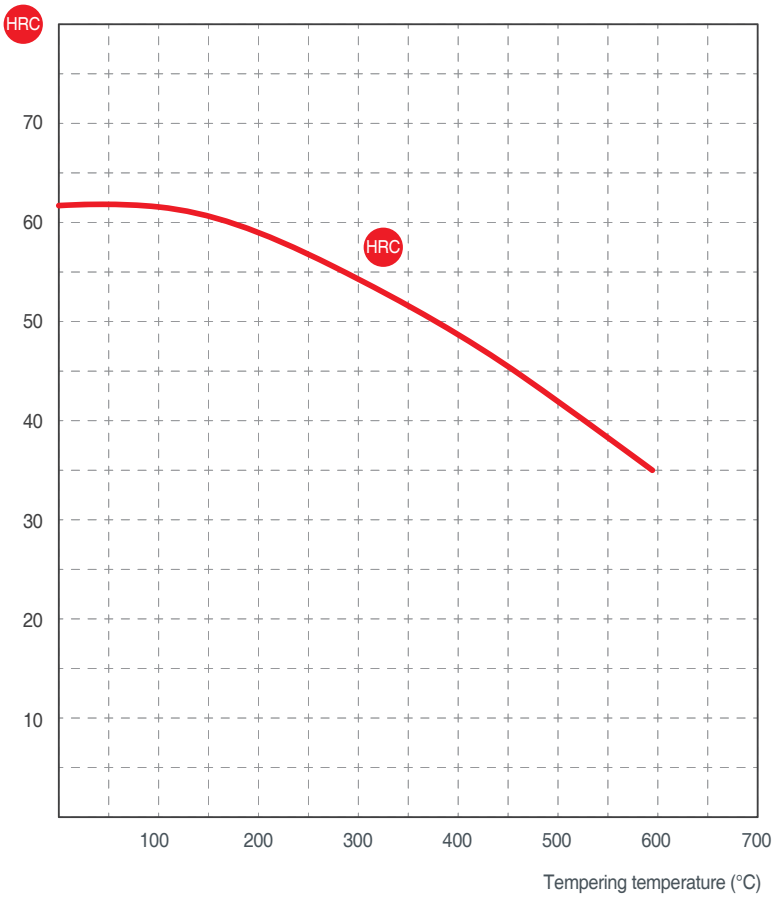
AUSTENITIC GRAIN
According ASTM E112 ≥ 5

ULTRASONIC TEST
According SEP 1921, acceptability class D/d

TECHNICAL **OVERVIEW**

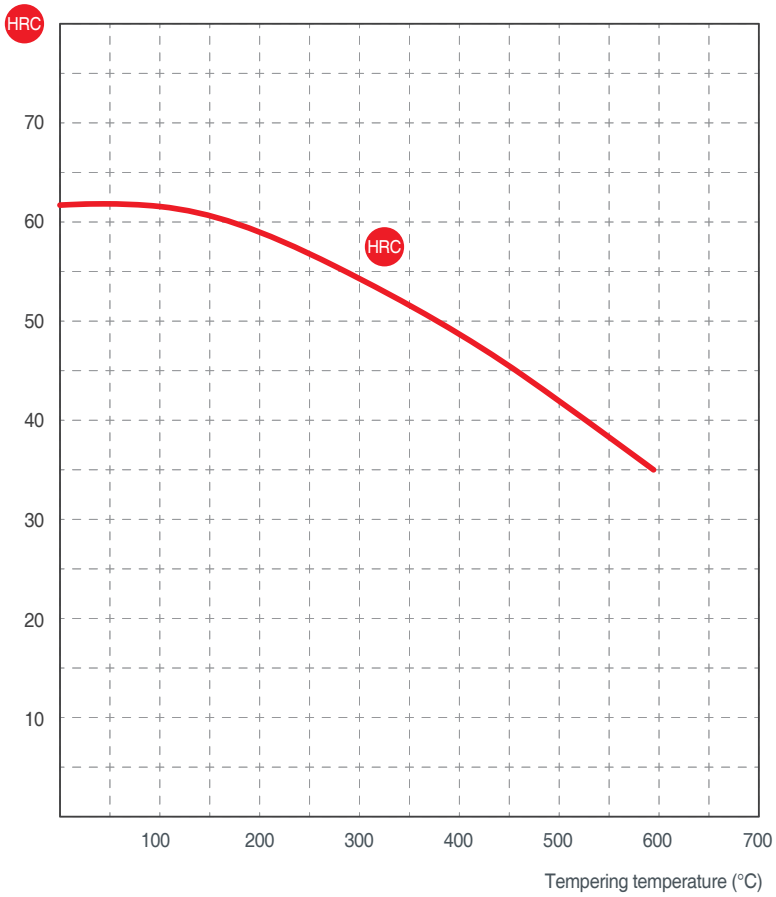
CLASS
STEEL

DENOMINATION
51CrMoV4



TECHNICAL **OVERVIEW**

CLASS	DENOMINATION
STEEL	**58CrMoV4**



CORRESPONDENCES

DIN	W. NO.	SIAU
58CrMoV4	1.7792	---

AISI/SAE	BS	
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CHEMICAL COMPOSITION in Weight %

C	Si	Mn	Cr
0.56-0.61	0.20-0.35	0.70-0.90	1.00-1.20

Mo	V	S	P
0.20-0.30	0.10-0.20	≤ 0.035	≤ 0.025

GENERAL INFORMATIONS

DESCRIPTION
Low alloyed cold working steel

APPLICATIONS
Cold working levelling rolls,

straightening rolls

MECHANICAL PROPERTIES
Tensile Strength: Rm = 950-1250 N/mm²

Yield Strength: Rs min. 750 N/mm²

Elongation A min. (%) 10

REDUCTION RATIO
Min. 4:1

INCLUSIONS
According ASTM E45 st. D

Accepted type A, B, C, D, max 2,0 T – max 1,5 H

AUSTENITIC GRAIN
According ASTM E112 ≥ 5

ULTRASONIC TEST
According SEP 1921, acceptability class D/d

CORRESPONDENCES

DIN	W. NO.	SIAU
100Cr6	1.3505	KS

AISI/SAE	BS	
52100	535A99 / EN31	

CHEMICAL COMPOSITION in Weight %

C	Si	Mn	Cr
0.93-1.05	0.15-0.35	0.25-0.45	1.35-1.60

Mo	S	P	
≤ 0.10	≤ 0.015	≤ 0.025	

GENERAL INFORMATIONS

DESCRIPTION
Low alloyed cold working steel

APPLICATIONS
Cold working levelling rolls and back-up rolls, straightening rolls

MECHANICAL PROPERTIES
Tensile Strength: Rm = 950-1200 N/mm²

REDUCTION RATIO
Min. 4:1

INCLUSIONS
According ASTM E45 st. D

Accepted type A, B, C, D, max 2,0 T – max 1,5 H

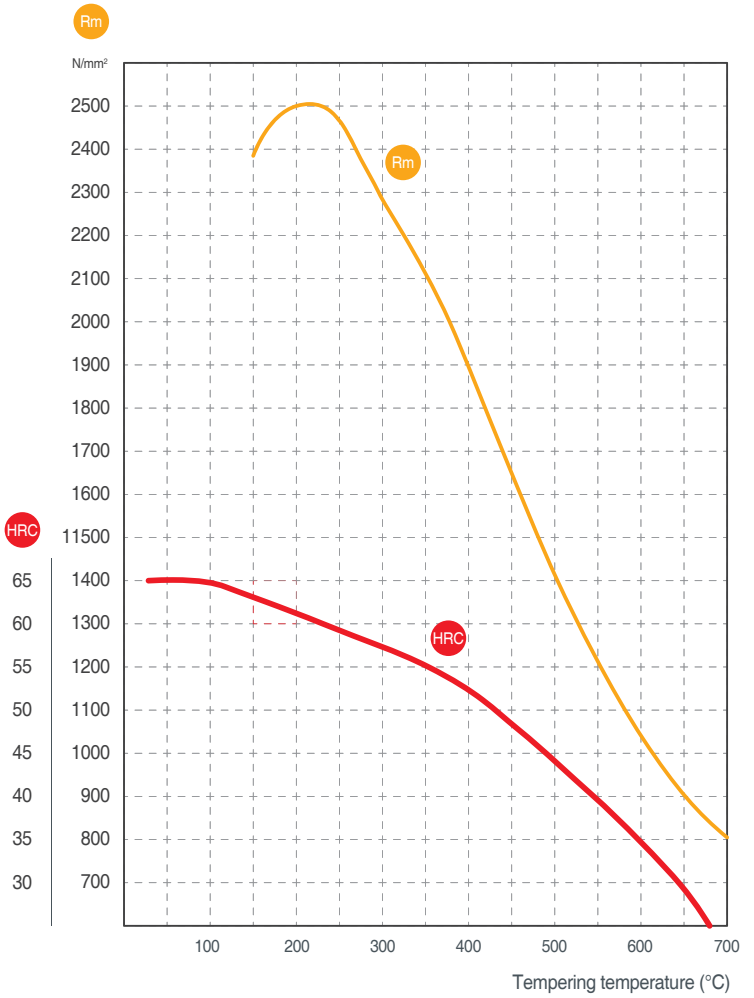
AUSTENITIC GRAIN
According ASTM E112 ≥ 5

ULTRASONIC TEST
According SEP 1921, acceptability class D/d

TECHNICAL **OVERVIEW**

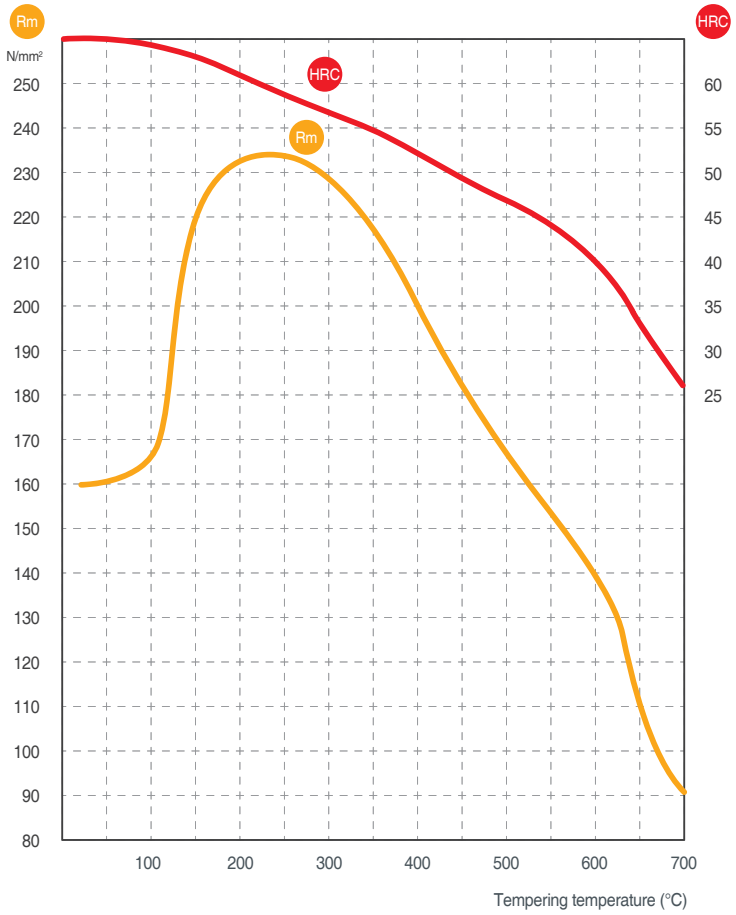
CLASS
STEEL

DENOMINATION
100Cr6



TECHNICAL **OVERVIEW**

CLASS	DENOMINATION
STEEL	**86CrMoV7**



CORRESPONDENCES

DIN	W. NO.	SIAU
86CrMoV7	1.2327	BKVM

AISI/SAE	BS	
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CHEMICAL COMPOSITION in Weight %

C	Si	Mn	Cr
0.83-0.90	0.15-0.35	0.30-0.45	1.60-1.90

Mo	V	S	P
0.20-0.35	0.05-0.15	≤ 0.030	≤ 0.030

GENERAL INFORMATIONS

DESCRIPTION
Low alloyed cold working tool steel

APPLICATIONS
Cold working rolls and back-up rolls, straightening rolls, cold plate leveller work and back-up rolls

MECHANICAL PROPERTIES
Tensile Strength: Rm = 900-1050 N/mm²

Yield Strength: Rs min. 750 N/mm²

Elongation A min. (%) 13

REDUCTION RATIO
Min. 4:1

INCLUSIONS
According ASTM E45 st. D

Accepted type A, B, C, D, max 2,0 T – max 1,5 H

AUSTENITIC GRAIN
According ASTM E112 ≥ 5

ULTRASONIC TEST
According SEP 1921, acceptability class D/d

TECHNICAL **OVERVIEW**

CLASS: STEEL

DENOMINATION: **56NiCrMoV7**

CORRESPONDENCES

DIN	W. NO.	SIAU
56NiCrMoV7	1.2714	M10EX

AISI/SAE	BS	
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CHEMICAL COMPOSITION in Weight %

C	Si	Mn	Cr
0.50-0.60	0.10-0.40	0.65-0.95	1.00-1.20

Mo	Ni	V	S
0.45-0.55	1.50-1.80	0.07-0.12	≤ 0.030

P			
≤ 0.030			

GENERAL INFORMATIONS

DESCRIPTION
Low alloyed hot working tool steel

APPLICATIONS
Hot plate leveller back-up rolls,

shafts and mandrels

MECHANICAL PROPERTIES
Tensile Strength: Rm = 950-1200 N/mm²

Yield Strength: Rs min. 850 N/mm²

Elongation A min. (%) 14

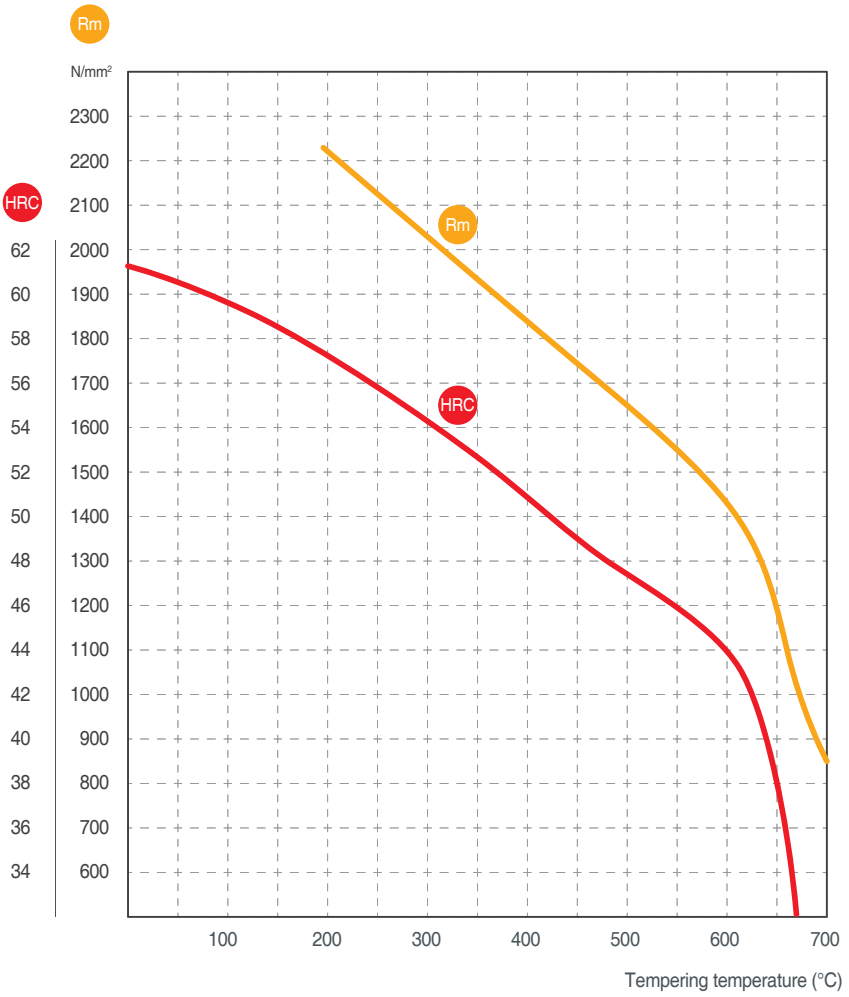
REDUCTION RATIO
Min. 4:1

INCLUSIONS
According ASTM E45 st. D

Accepted type A, B, C, D, max 2,0 T – max 1,5 H

AUSTENITIC GRAIN
According ASTM E112 ≥ 5

ULTRASONIC TEST
According SEP 1921, acceptability class D/d



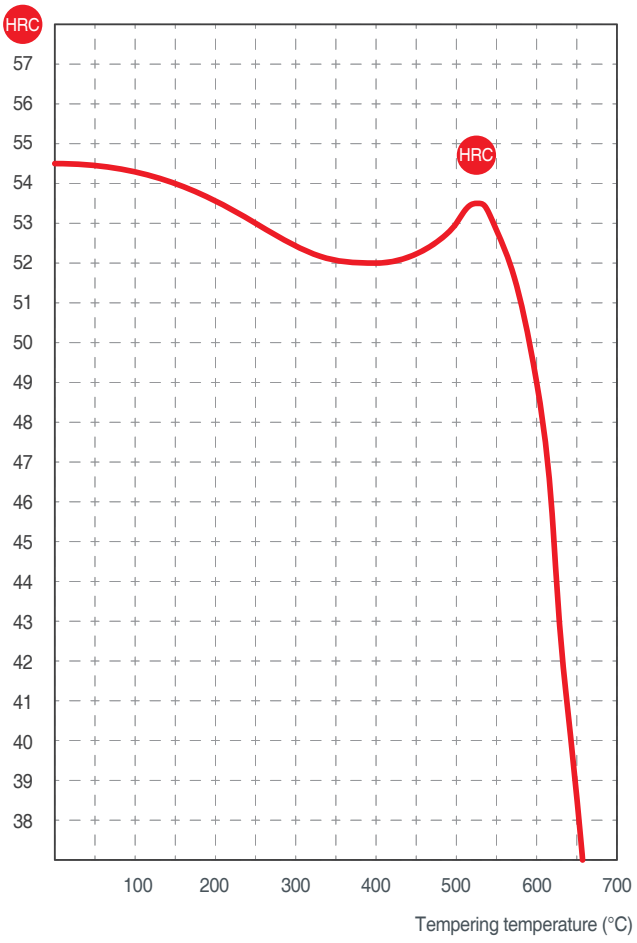
TECHNICAL **OVERVIEW**

CLASS

STEEL

DENOMINATION

X38CrMoV5.1



CORRESPONDENCES

DIN	W. NO.	SIAU
X38CrMoV5.1	1.2343	MTB

AISI/SAE	BS	
H11	BH11	

CHEMICAL COMPOSITION in Weight %

C	Si	Mn	Cr
0.36-0.42	0.90-1.20	0.30-0.50	4.80-5.50

Mo	V	S	P
1.10-1.40	0.25-0.50	≤ 0.030	≤ 0.030

GENERAL INFORMATIONS

DESCRIPTION
High alloyed hot working tool steel

APPLICATIONS
Hot plate leveller work rolls

MECHANICAL PROPERTIES
Tensile Strength: Rm = 950-1100 N/mm²

Yield Strength: Rs min. 800 N/mm²

Elongation A min. (%) 14

REDUCTION RATIO
Min. 4:1

INCLUSIONS
According ASTM E45 st. D

Accepted type A, B, C, D, max 2,0 T – max 1,5 H

AUSTENITIC GRAIN
According ASTM E112 ≥ 5

ULTRASONIC TEST
According SEP 1921, acceptability class D/d

CORRESPONDENCES

DIN	W. NO.	SIAU
X40CrMoV5.1	1.2344	MTV

AISI/SAE	BS	
H13	BH13	

CHEMICAL COMPOSITION in Weight %

C	Si	Mn	Cr
0.37-0.43	0.90-1.20	0.30-0.50	4.80-5.50

Mo	V	S	P
1.20-1.50	0.90-1.10	≤ 0.030	≤ 0.030

GENERAL INFORMATIONS

DESCRIPTION
High alloyed hot working tool steel

APPLICATIONS
Hot plate leveller work rolls

MECHANICAL PROPERTIES
Tensile Strength: Rm = 950-1100 N/mm²

Yield Strength: Rs min. 850 N/mm²

Elongation A min. (%) 14

REDUCTION RATIO
Min. 4:1

INCLUSIONS
According ASTM E45 st. D

Accepted type A, B, C, D, max 2,0 T – max 1,5 H

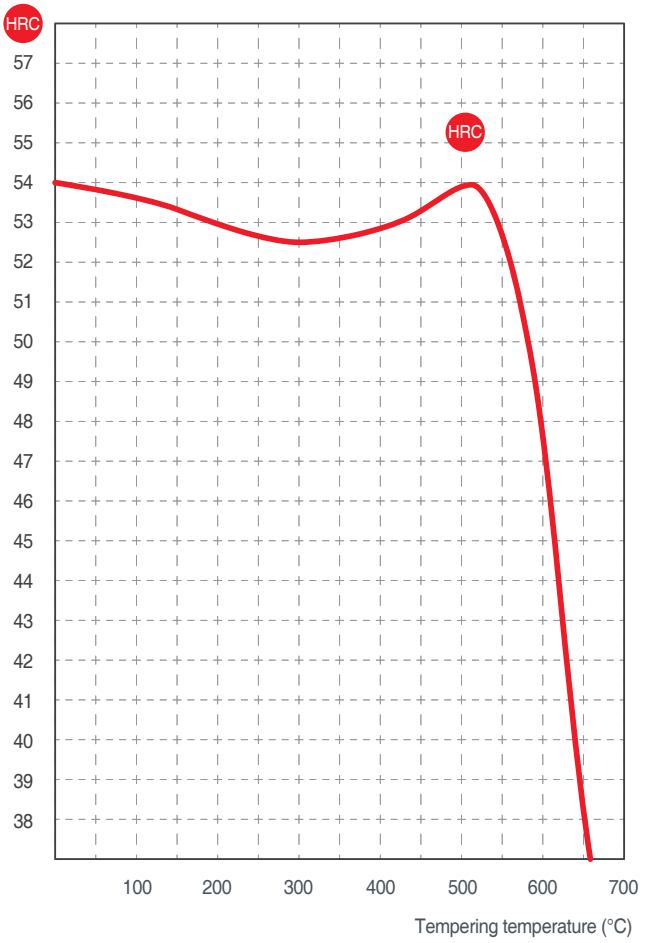
AUSTENITIC GRAIN
According ASTM E112 ≥ 5

ULTRASONIC TEST
According SEP 1921, acceptability class D/d

TECHNICAL **OVERVIEW**

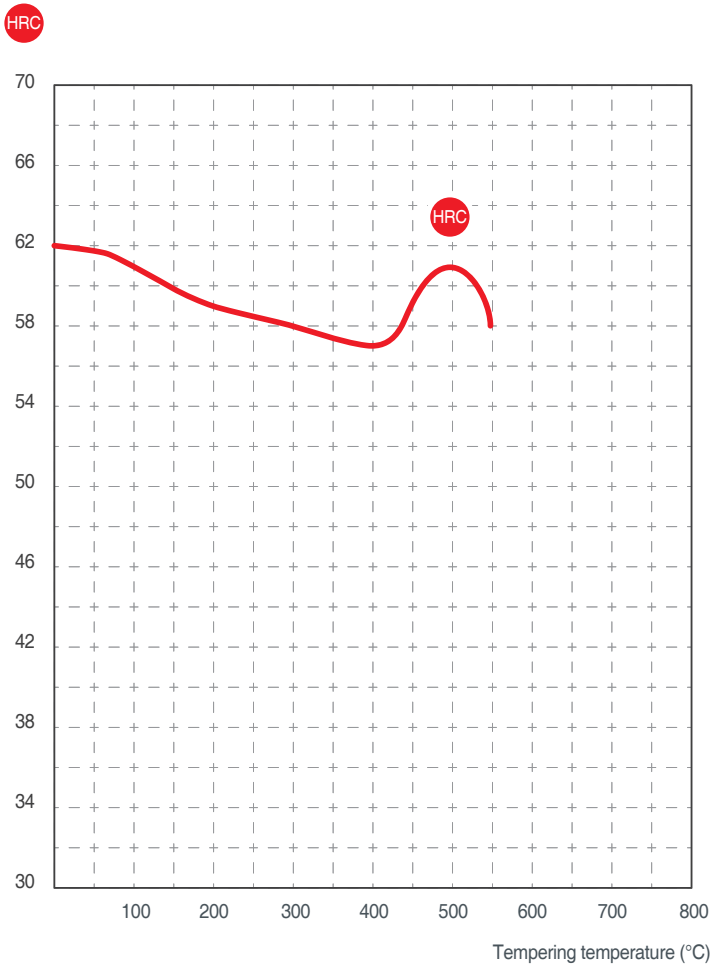
CLASS
STEEL

DENOMINATION
X40CrMoV5.1



TECHNICAL **OVERVIEW**

CLASS	DENOMINATION
STEEL	**X63CrMoV5.1**



CORRESPONDENCES

DIN	W. NO.	SIAU
X63CrMoV5.1	1.2362	---

AISI/SAE	BS	
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CHEMICAL COMPOSITION in Weight %

C	Si	Mn	Cr
0.60-0.65	1.00-1.20	0.30-0.60	5.00-5.50

Mo	V	S	P
1.00-1.30	0.25-0.35	≤ 0.035	≤ 0.035

GENERAL INFORMATIONS

DESCRIPTION
High alloyed hot & cold working tool steel

APPLICATIONS
Hot & cold plate leveller work and back-up rolls

MECHANICAL PROPERTIES
Tensile Strength: Rm = 950-1100 N/mm²

Yield Strength: Rs min. 750 N/mm²

Elongation A min. (%) 14

REDUCTION RATIO
Min. 4:1

INCLUSIONS
According ASTM E45 st. D;

accepted type A, B, C, D, max 2,0 T – max 1,5 H

AUSTENITIC GRAIN
According ASTM E112 ≥ 5

ULTRASONIC TEST
According SEP 1921, acceptability class D/d

CORRESPONDENCES

DIN	W. NO.	SIAU
X155CrVMo12.1	1.2379	KORV

AISI/SAE	BS	
D2	BD2	

CHEMICAL COMPOSITION in Weight %

C	Si	Mn	Cr
1.50-1.60	0.10-0.40	0.15-0.45	11.0-12.0

Mo	V	S	P
0.60-0.80	0.90-1.10	≤ 0.030	≤ 0.030

GENERAL INFORMATIONS

DESCRIPTION
High alloyed cold working tool steel

APPLICATIONS
Cold working rolls, scale breaker rolls, bars and profiles straightening rolls

MECHANICAL PROPERTIES
Hardness: 60-63 HRC

REDUCTION RATIO
Min. 4:1

INCLUSIONS
According ASTM E45 st. D

Accepted type A, B, C, D, max 2,0 T – max 1,5 H

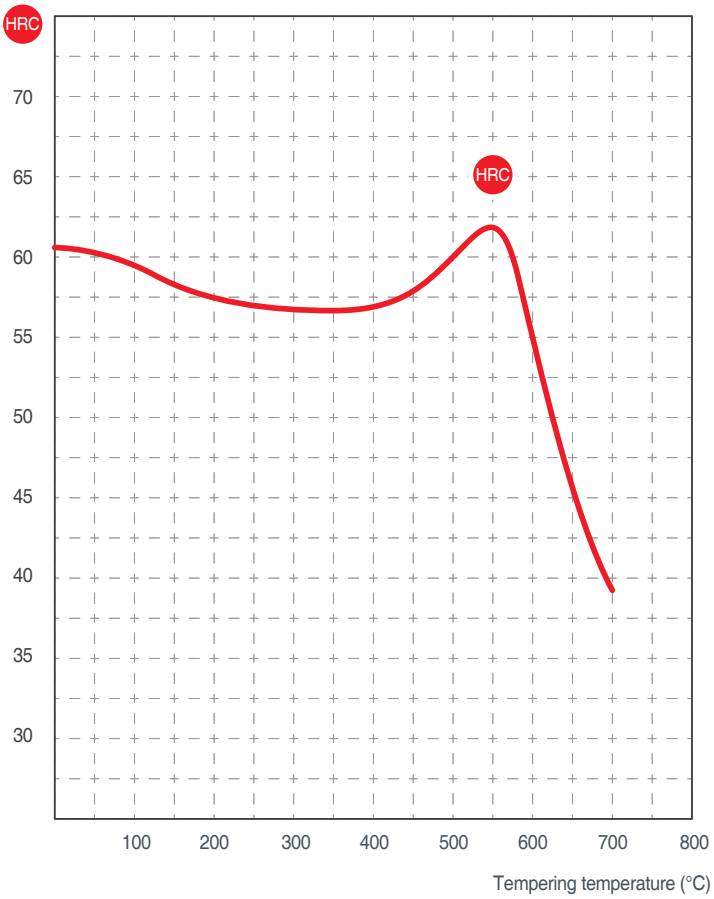
AUSTENITIC GRAIN
According ASTM E112 ≥ 5

ULTRASONIC TEST
According SEP 1921, acceptability class D/d

TECHNICAL **OVERVIEW**

CLASS — DENOMINATION

STEEL — **X155CrVMo12.1**



COMESA is a company specialized in manufacturing steel rolls and wear parts according to drawings, with expert knowledge of heat-treatments and steel-working processes.

COMESA is part of an industrial holding owned by group ORIC, which handles administration and IT services.

Among the main partners, a prominent role is played by FORGIA RAPIDA (ISO 9001 certified company), for the production of forged parts.

Thanks to the experience accumulated in over 50 years of presence in the market and to the quality of its products, COMESA has managed to consolidate itself as a supplier to the main manufacturers and users of metal working machines and plants in Italy, Europe and Worldwide.

Our customer base falls into three main categories:

- STEEL WORKS AND ALUMINUM MILLS;
- METAL WORKING SERVICE CENTRES;
- BAR MILLS.

Made in Italy

COMESA

Gruppo Oric S.p.a.

COMESA s.r.l.
COSTRUZIONI MECCANICHE SALICETO

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