

# High Strength Special Steel HSX<sup>®</sup> 90

## Chemical analysis

(cast analysis in % by mass)

element	C	Si	Mn	P	S	Al	B	V	Ti
min	0,06	0,15	1,85	-	-	0,02	0,0015	0,03	0,06
max	0,09	0,25	1,95	0,015	0,015	0,04	0,0030	0,05	0,10

$Ti+Nb+V \leq 0.22$

The chemical analysis is acc. to 7MnB8 (1.5519)

The permissible deviations in the product analysis in relation to the specified limits of the cast analysis are specified in EN 10083-1.

## Mechanical-technological properties

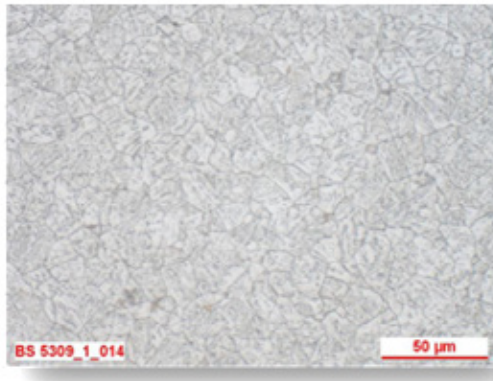
property	yield strength $R_{p0.2}$ MPa	tensile strength $R_m$ MPa	elongation $A_5$ %
min	650	700	10
max	950	1'000	20

The mechanical-technological properties are adaptable to the specific application by variation of the process parameters.

# Microstructure with isotropic characteristics

The microstructure consists of bainite.

The grain size based on ASTM E 112 is > 6.

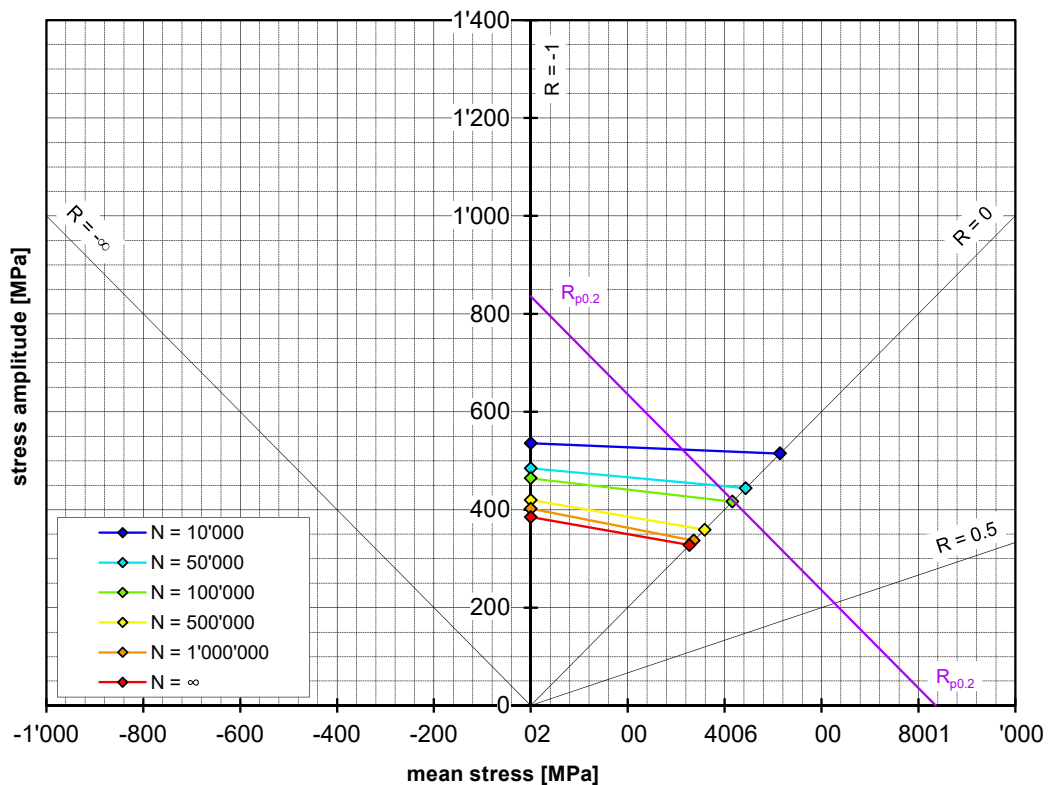


cross section, drawn to 7.0 mm, sample taken on mid radius, Nital etching



transversal section, drawn to 36.0 mm, sample taken on mid radius, Nital etching

# Tension-compression fatigue strength diagram acc. to Haigh ( $K_t = 1.02$ )



## Magnetic characteristics

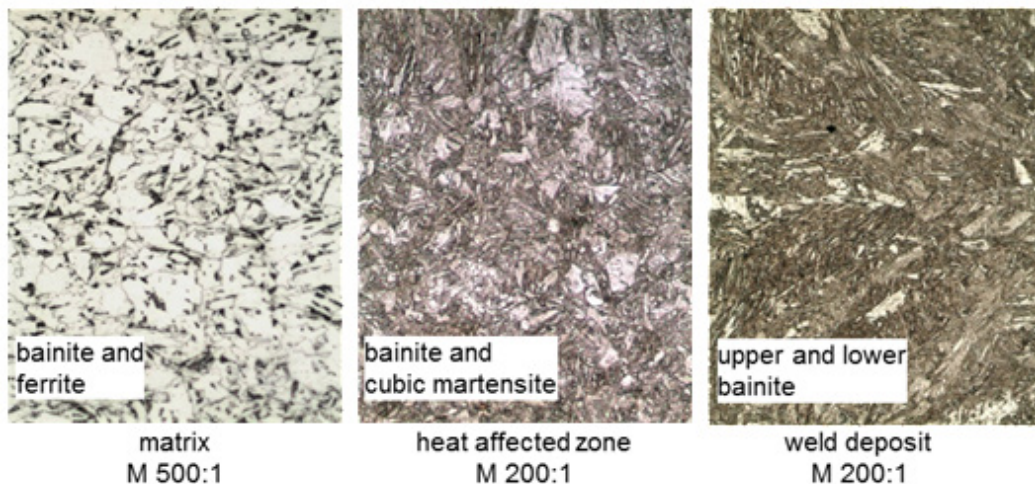
property	symbol	unit	+C	+C +A	+W	+W +A
Remanence	$B_r$	T	0.76	1.00	0.85	0.83
Coercitive field strength	$H_c$	kA/m	0.74	0.52	0.65	0.60
Max. permeability	$\mu_{max}$	-	430	740	560	600
Field strength H at $\mu_{max}$	$H(\mu_{max})$	kA/m	1.4	0.8	1.0	0.9
Max. magn. polarisation	$J_{max}$	T	2.1	2.1	2.1	2.1
Hysteresis losses	W	kJ/m <sup>3</sup>	5.2	4.3	4.6	4.3

The specific resistance R is found to be approx 25 - 30  $\mu\Omega$  cm.

## Advice for subsequent processing

HSX® 90 is very well cold formable.

## Joining process - laser beam welding



A high strength and ductile microstructure was achieved in the weld area, which is usually requested. The microstructure consists of lower bainite and cubic martensite.

## Surface quality

Bars are 100% eddy current tested acc. to surface quality class 3 of EN 10277-1.  
Bar ends untested on both sides with a length of 50 mm if not otherwise requested by customer.

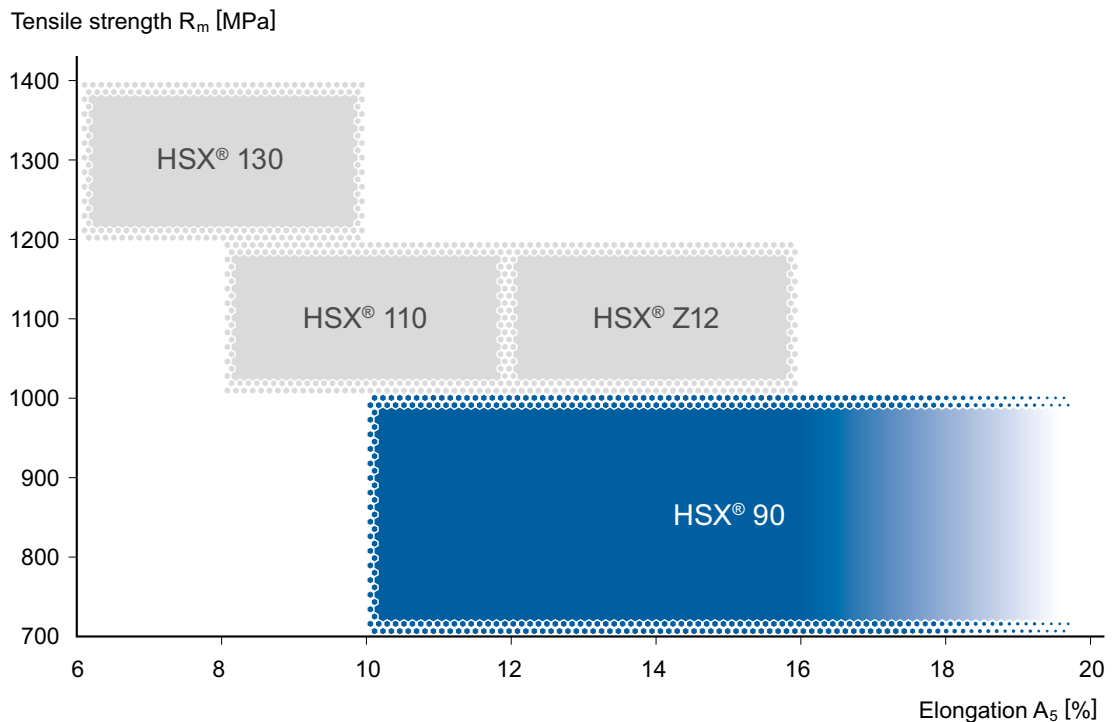
## Miscellaneous

Other agreements acc. to order

## Condition of delivery

Bright bar, drawn  
Diameter range from 4.15 to 36.0 mm  
Tolerance h11

## HSX® 90 within the product portfolio



We reserve the right to make changes and technical improvements without notice. Errors and omissions excepted. The desired performance characteristics are only binding if they had been agreed upon exclusively at the time that the contract was made.