

# SPECRA R

High Speed Steel

## Chemical composition

	C	Si	Mn	Mo	Cr	Ni	W, V, Nb
<b>SPECRA R</b>	1.1 2.1	0.5 1.5	0.5 1.5	2.0 8.0	3.0 7.0	0.5 1.5	2-10
URMA	0.8 1.8	0.5 1.5	0.5 1.5	<1	10.0 14.0	0.5 1.5	<1
STELLA	0.8 1.8	0.5 1.5	0.5 1.5	2.0 8.0	5.0 9.0	0.5 1.5	1-6

## Properties

Hardness Range	Le	745-790
Tensile strength	(MPa)	750
Thermal conductivity	(W/m x K)	22
Thermal exp. coeff. (20-100C)	(1/Kx10-6)	13
Young's modulus	(GPa)	235
Poisson's ratio	-	0,28
Density	(kg/m <sup>3</sup> )	7700
Specific heat	(J/kg x K)	430

## Comparative properties

	Wear resistance	Fire crack resistance	Oxidation behaviour	Friction
<b>SPECRA R</b>	————	————	————	————
URMA	—	————	—	—
STELLA	————	————	————	————

## Description

Double poured high speed steel produced by the vertical spin casting process.

The microstructure consists of a tempered bainitic/martensitic matrix with  $M_7C_3$ -,  $M_2C$ - and small evenly distributed MC-carbides.

The roll is heat treated at high temperatures to obtain optimum material properties, favourable stress levels and homogeneous hardness.

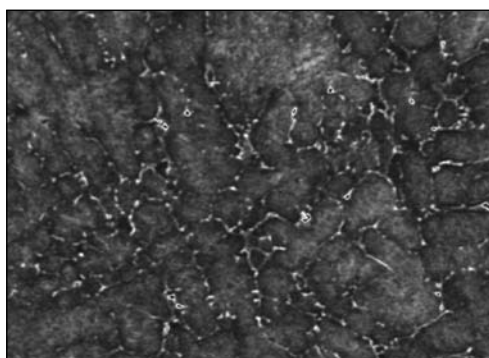
### CORE MATERIAL

Nodular iron (SG).

(Properties displayed in a separate product data sheet.)

## Applications

Work rolls for the roughing stands of conventional HSM and Steckel mills.



Microstructure SPECRA R

## Features & Benefits

- Excellent wear resistance in combination with good operation safety.
- Good fire crack resistance and very good oxidation behaviour at high temperatures.
- Constant material properties throughout the usable shell.