

## DIN 1.3207 High Speed Steel Technical Introduce

### 1. Brief:

Brand	Supplier	Grade	DIN	EN	AISI/SAE	JIS
Baosteel Group	WixSteel	1.3207	S10-4-3-10	HS10-4-3-10	T42	SKH 57

### 2. Chemical Composition (in weight %):

C	Si	Mn	Cr	Mo	Ni	V	W	Others
1.28	max. 0.45	max. 0.40	4.15	3.55	-	3.25	9.50	Co: 10.0

### 3. Description:

DIN 1.3207 is a high-performance, high-speed tool steel with optimum cutting performance and good hardness in high temperature environment, also plus a good degree of toughness.

### 4. Applications:

DIN 1.3207 mostly use for universal application to give CNC knife tool a life times against cutting, wear and tear. All kinds of blades for wood machining, CNC machining, plastic mold machining etc. For severely stressed tools in roughing work, cutting tools for very hard materials, turning blades, wood working tools and tools for cold work.

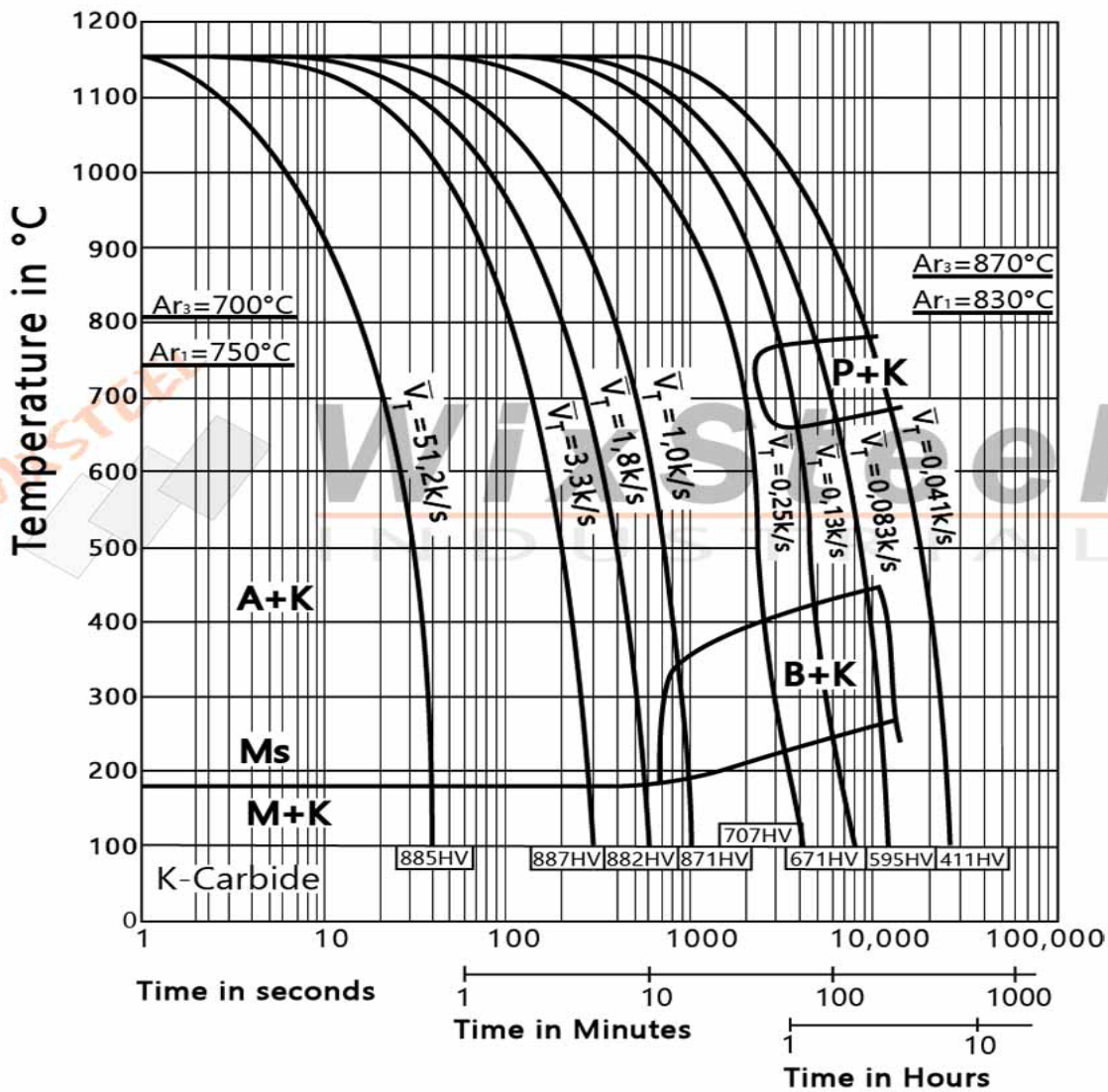
### 5. Physical properties (average values) at ambient temperature:

Modulus of elasticity [10<sup>3</sup> x N/mm<sup>2</sup>]: 217  
 Density [g/cm<sup>3</sup>]: 8.23  
 Thermal conductivity [W/m.K]: 19.0  
 Electric resistivity [Ohm mm<sup>2</sup>/m]: 0.80  
 Specific heat capacity[J/g.K]: 0.46

### 6. Coefficient of Linear Thermal Expansion 10<sup>-6</sup> °C<sup>-1</sup>

20-100°C	20-200°C	20-300°C	20-400°C	20-500°C	20-600°C	20-700°C
9.6	10.0	10.1	10.3	10.5	10.7	10.7

## 7. Continuous Cooling Transformation (CCT) Diagram:



## 8. Heat Treatment Process Requirement:

The below technical details strictly follow DIN 1.3207 standard to get right ratio among different crystal organization, to let this material performance can be as good as required. Below is the details:

- **Soft Annealing:**

Heat to 800-860°C, cool slowly in furnace. This will produce a maximum Brinell hardness of 300.

- **Stress Relieving:**

Stress relieving to remove machining stresses should be carried out by heating to 600-650°C, holding for one hour at heat, followed by air cooling. This operation is performed to reduce distortion during heat treatment.

- **Hardening:**

Harden from a temperature of 1200-1230°C followed by oil, air quenching or warm bath at 540°C. Hardness after quenching is 64-66 HRC.

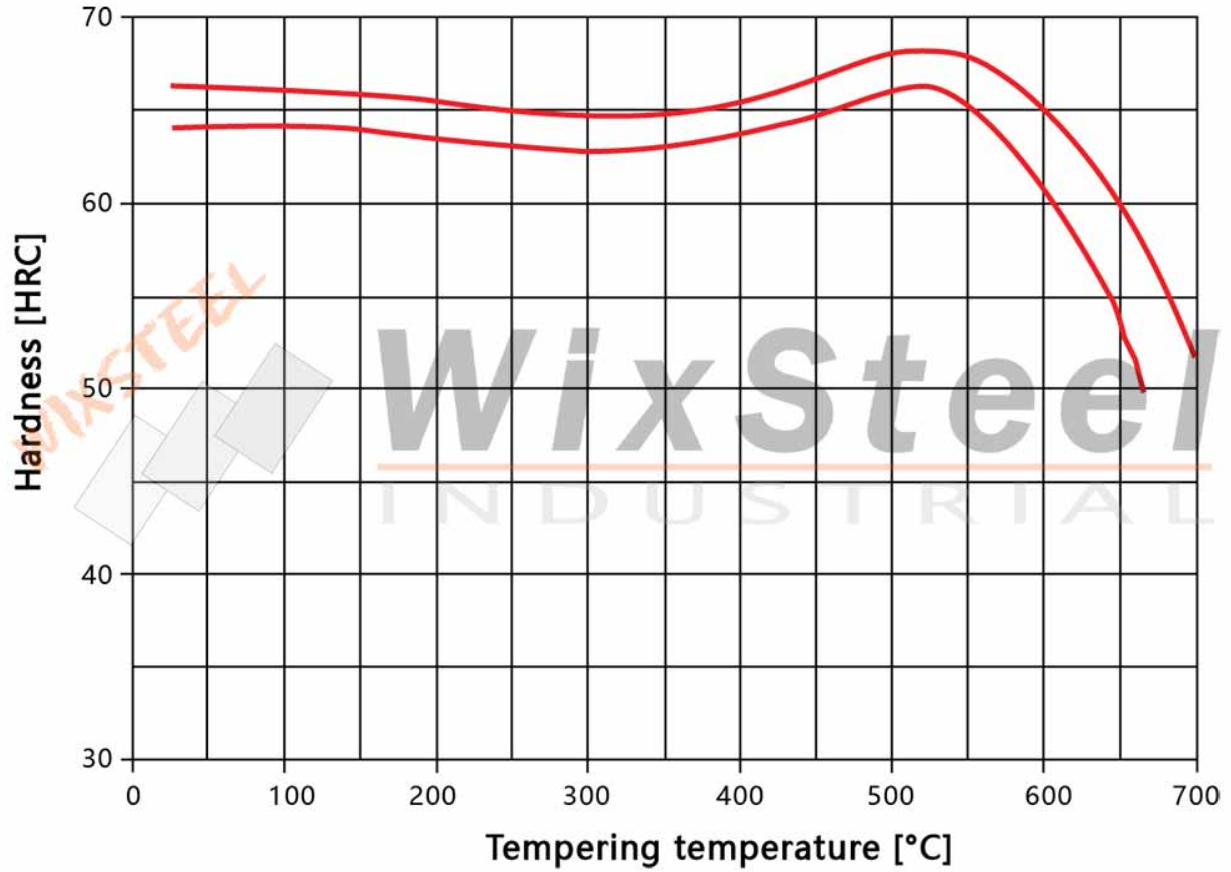
- **Tempering:**

Tempering temperature: 540-570°C, at least 2x for 65 - 67 HRC. Hardness after tempering is 64-67 HRC.

- **Tempering Temperature (°C) vs. Hardness (HRC):**

100°C	200°C	300°C	400°C	450°C	500°C	550°C	600°C	650°C
65.0	64.5	64.0	64.5	65.5	67.0	66.5	63.0	57.0

- **Tempering Diagram:**



- **Forging:**

Hot forming temperature: 1100-900°C.

## 9. Mechanical Properties:

Rp0.2 (MPa)	Rm (MPa)	Impact KV (J)	Elongation A (%)	A Z (%)	Delivery	Hardness
1850 (≥)	1980 (≥)	98	12	68	Solution & Aging, Ann, Ausaging, Q+T	61 HRC

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