

# Database of Steel and Alloy ( Marochnik )

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## Characteristics for grade 3KH3M3F ( 3X3M3Φ ).

|                    |                         |
|--------------------|-------------------------|
| Grade :            | 3KH3M3F ( 3X3M3Φ )      |
| Classification :   | Die tool steel          |
| Equivalent grades: | <a href="#">Go here</a> |

## Chemical composition in % for grade 3KH3M3F ( 3X3M3Φ )

| C           | Si        | Mn        | Ni      | S        | P        | Cr        | Mo      | V         | Cu      |
|-------------|-----------|-----------|---------|----------|----------|-----------|---------|-----------|---------|
| 0.27 - 0.34 | 0.1 - 0.4 | 0.2 - 0.5 | max 0.4 | max 0.03 | max 0.03 | 2.8 - 3.5 | 2.5 - 3 | 0.4 - 0.6 | max 0.3 |

## Temperature of critical points for grade 3KH3M3F ( 3X3M3Φ ).

|                                                                                                 |
|-------------------------------------------------------------------------------------------------|
| $A_{c1} = 815$ , $A_{c3}(A_{cm}) = 875$ , $A_{r3}(A_{rcm}) = 820$ , $A_{r1} = 760$ , $Mn = 340$ |
|-------------------------------------------------------------------------------------------------|

## Mechanical properties under T=20°C for grade 3KH3M3F ( 3X3M3Φ )

| Assortment | Dimension | Direct. | $\sigma_B$ | $\sigma_T$ | $\delta_5$ | $\psi$ | KCU                 | Heat treatment                            |
|------------|-----------|---------|------------|------------|------------|--------|---------------------|-------------------------------------------|
| -          | mm        | -       | MPa        | MPa        | %          | %      | kJ / m <sup>2</sup> | -                                         |
| Steel      |           |         | 1670       | 1470       |            | 50     | 220                 | Guenching 1040°C, oil, Drawing 600°C, 2h, |

Brinell hardness for 3KH3M3F ( 3X3M3Φ ) (heat treatment), GOST 5950-2000

HB 10 <sup>-1</sup> = 229 MPa

## Physical properties for grade 3KH3M3F ( 3X3M3Φ )

| T     | E 10 <sup>-5</sup> | $\alpha$ 10 <sup>6</sup> | $\lambda$      | $\rho$            | C            | R 10 <sup>9</sup> |
|-------|--------------------|--------------------------|----------------|-------------------|--------------|-------------------|
| Grade | MPa                | 1/Grade                  | Watt/(m·Grade) | kg/m <sup>3</sup> | J/(kg·Grade) | Ohm·m             |
| 20    | 2.07               |                          | 32             | 7828              |              | 314               |
| 100   |                    |                          | 34             | 7808              |              | 365               |
| 200   |                    |                          | 36             | 7783              |              | 430               |
| 300   | 1.77               |                          | 36             | 7754              |              | 515               |
| 400   |                    |                          | 36             | 7721              |              | 600               |
| 500   |                    |                          | 36             | 7684              |              | 710               |
| 600   |                    |                          | 34             | 7642              |              | 835               |
| 700   |                    |                          | 34             | 7597              |              | 965               |
| 800   |                    |                          | 33             | 7565              |              | 1118              |
| 900   |                    |                          | 34             | 7525              |              | 1151              |
| T     | E 10 <sup>-5</sup> | $\alpha$ 10 <sup>6</sup> | $\lambda$      | $\rho$            | C            | R 10 <sup>9</sup> |

## Equivalent steels for grade 3KH3M3F ( 3X3M3Φ )

Warning! Indicated both exact and nearest equivalents.

| USA                  | Germany                                                                  | Japan         | France                                 | England              | European                                                    | Italy          | Spain     | Bulgaria     | Hungary      | Poland | Romania   | Czechia | Austria            |
|----------------------|--------------------------------------------------------------------------|---------------|----------------------------------------|----------------------|-------------------------------------------------------------|----------------|-----------|--------------|--------------|--------|-----------|---------|--------------------|
| -                    | DIN, WNr                                                                 | JIS           | AFNOR                                  | BS                   | EN                                                          | UNI            | UNE       | BDS          | MSZ          | PN     | STAS      | CSN     | ONORM              |
| H10<br>H12<br>T20810 | 1.2365<br>30CrMoV12<br>45WCrV7<br>X30WCrV5-3<br>X30WCrV9-3<br>X32CrMoV3- | SKD62<br>SKD7 | 32CDV12-28<br>32CrMoV12-28<br>Z35CWDV5 | 2365<br>BH10<br>BH12 | 1.2365<br>1.6580<br>30CrMoV12-11<br>30CrNiMo8<br>32CrMoV12- | 30CrMoV12-27KU | 30CrMoV12 | 32CrMoV12-28 | CMV40<br>K14 | WLV    | 31VMoCr29 | 19541   | BOHLERW320<br>W320 |

