

## 24NiSiMnMo7-6-6\* All

### General Information

Ovako 275 is a high strength, quench and tempering steel with good toughness and still maintaining high hardness and high strength. It has a low sulfur range to obtain good transverse properties. Typical applications for Ovako275 are found in the mining industry generally used for bits.

For additional Heat Treatment Data, please visit the Heat Treatment Guide.

*\* Designation followed by "" is not an official EN standard grade but named according to the rules in EN 10027.*

### Similar designations

ASTM A579 (31), AMS 6418

### Chemical composition

| Variant | Cast | Weldability             |     | C %  | Si % | Mn % | P %   | S %   | Cr % | Ni % | Mo % |
|---------|------|-------------------------|-----|------|------|------|-------|-------|------|------|------|
| 275A    | IC   | CEV0.86 <sub>max</sub>  | Mn  | 0.23 | 1.40 | 1.30 | -     | -     | 0.25 | 1.65 | 0.39 |
|         |      | Pcm 0.51 <sub>max</sub> | Max | 0.28 | 1.70 | 1.50 | 0.025 | 0.010 | 0.40 | 2.00 | 0.45 |

## Mechanical Properties

| Variant | Condition | Format    | Dimension [mm] | Yield strength min [MPa] | Tensile strength [MPa] | Elongation A <sub>5</sub> [%] | Reduction of area Z <sub>min</sub> [%] | Hardness       |
|---------|-----------|-----------|----------------|--------------------------|------------------------|-------------------------------|--|----------------|
| 275A    | +A        | Round bar | 25 < 100       | 520                      | 730 typical            | 20                            | 50                                     | 225 HB typical |
|         | +QT       | Round bar | 25 < 100       | 1240                     | 1310 typical           | 5                             | 30                                     | -              |

*R<sub>p0.2</sub> \* R<sub>eh</sub>, \*\* R<sub>el</sub>*

## Transformation temperatures

|     | Temperature °C |
|-----|----------------|
| MS  | 349            |
| AC1 | 727            |
| AC3 | 829            |

## Heat treatment recommendations

| Treatment      | Condition | Temperature cycle             | Cooling/quenching |
|----------------|-----------|-------------------------------|-------------------|
| Hot forging    | +AR       | Soaking 950 - 1200°C          | In air            |
| Normalizing    | +AR       | Soaking at 900 - 950°C        | In air            |
| Soft annealing | +AR       | Annealing soaking 650 - 730°C | In air            |
| Hardening      | +AR       | Hardening at 860 - 890°C      | Quenching in oil  |
| Tempering      | +QO       | Tempering 200 - 600°C         | In air            |

## Hardenability

Typical values Jominy at 1.5 mm/49HRC; 15 mm/48HRC; 30 mm/47.5HRC; 50 mm/45HRC

## Steel cleanliness

| Micro inclusions          |          |     |     |     |    |    |     | Macro inclusions |                                |                          |
|---------------------------|----------|-----|-----|-----|----|----|-----|------------------|--------------------------------|--------------------------|
| Applied standard          | ASTME45  |     |     |     |    |    |     | Applied standard | ISO 3763<br>(Blue fracture)    |                          |
| Sampling                  | ASTMA295 |     |     |     |    |    |     | Sampling         | Statistical testing on billets |                          |
| Maximum average<br>limits | A        |     | B   |     | C  |    | D   |                  | Limits                         | < 2,5 mm/dm <sup>2</sup> |
|                           | Th       | He  | Th  | He  | Th | He | Th  | He               |                                |                          |
|                           | 1,5      | 1,0 | 1,0 | 0,5 | 0  | 0  | 0,5 | 0,5              |                                |                          |

## Other properties (typical values)

| Youngs module (GPa)           | Poisson's ratio (-)                      | Shear module (GPa)                               | Density (kg/m <sup>3</sup> )                     |
|-------------------------------|--|--|--|
| 210                           | 0.3                                      | 80   | 7800   |
| Average CTE 20-300°C (µm/m°K) | Specific heat capacity 50/100°C (J/kg°K) | Thermal conductivity Ambient temperature (W/m°K) | Electrical resistivity Ambient temperature (µΩm) |
| 12                            | 460 - 480                                | 40 - 45  | 0.20 - 0.25                                      |

## Contact us

Would you like to know more about our offers? Don't hesitate to contact us:

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For more detailed information please visit <http://www.ovako.com/en/Contact-Ovako/>

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