

COLD WORK TOOL STEEL

| Wr.Nr. | PN     | EN          | GOST | AISI |
|--------|--------|-------------|------|------|
| 1.2379 | NC11LV | X153CrMoV12 | X12  | D2   |

## CHEMICAL COMPOSITION

Chemical composition (in weight %)

| Element | C    | Si   | Mn   | P    | S    | Cr    | Mo   | V    |
|---------|------|------|------|------|------|-------|------|------|
| min     | 1.45 | 0.10 | 0.20 | max. | max. | 11.00 | 0.70 | 0.70 |
| max     | 1.60 | 0.60 | 0.60 | 0.03 | 0.03 | 13.00 | 1.00 | 1.00 |

## APPLICATION

High-duty cutting tools (dies and punches), blanking and punching tools, woodworking tools, shear blades for cutting light-gauge material, thread rolling tools, tools for drawing, deep drawing and cold extrusion, pressing tools for the ceramics and pharmaceutical industries, cold rolls (working rolls) for multiple-roll stands, measuring instruments and gauges, small moulds for the plastics industry where excellent wear resistant required.

## TREATMENT

|                |                                      |
|----------------|--------------------------------------|
| Hardening      | 1020°C ± 10°C/Air                    |
| Tempering      | 180°C ± 10°C (see tempering diagram) |
| Hardness [HRC] | min. 61                              |

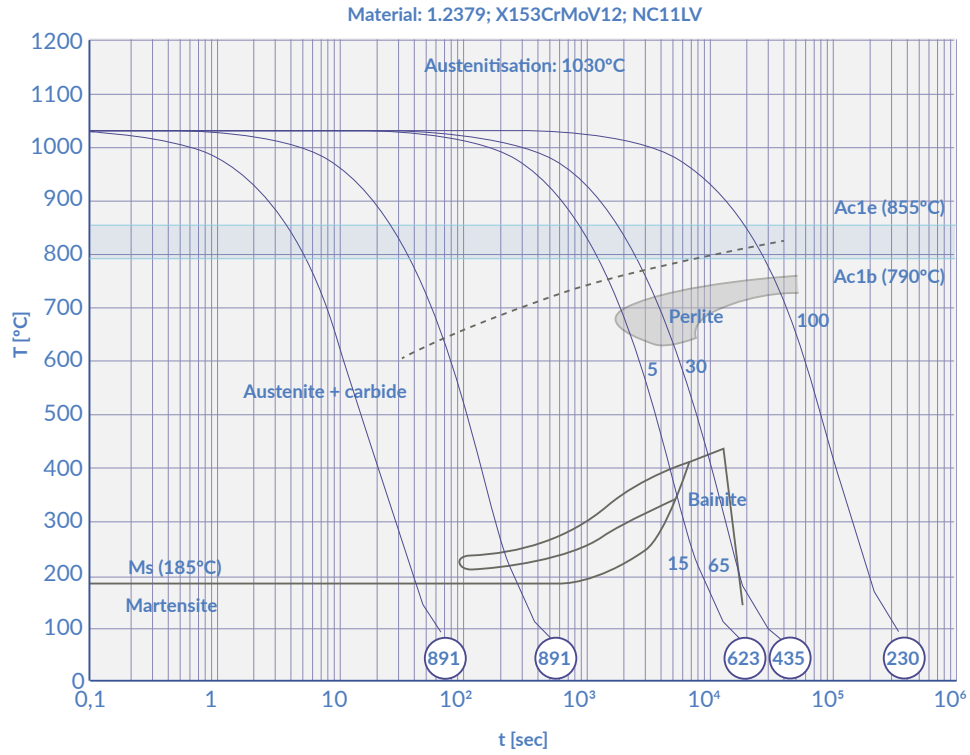
## ADDITIONAL HEAT TREATMENT

|                            |  |
|----------------------------|--|
| Soft annealing             | 830 - 860°C  |
| Stress relieving           | 650 - 680°C (only for soft delivery conditions)      |
| Additional quenching media | Oil, hot bath 500°C, fluidised bed, gas overpressure |

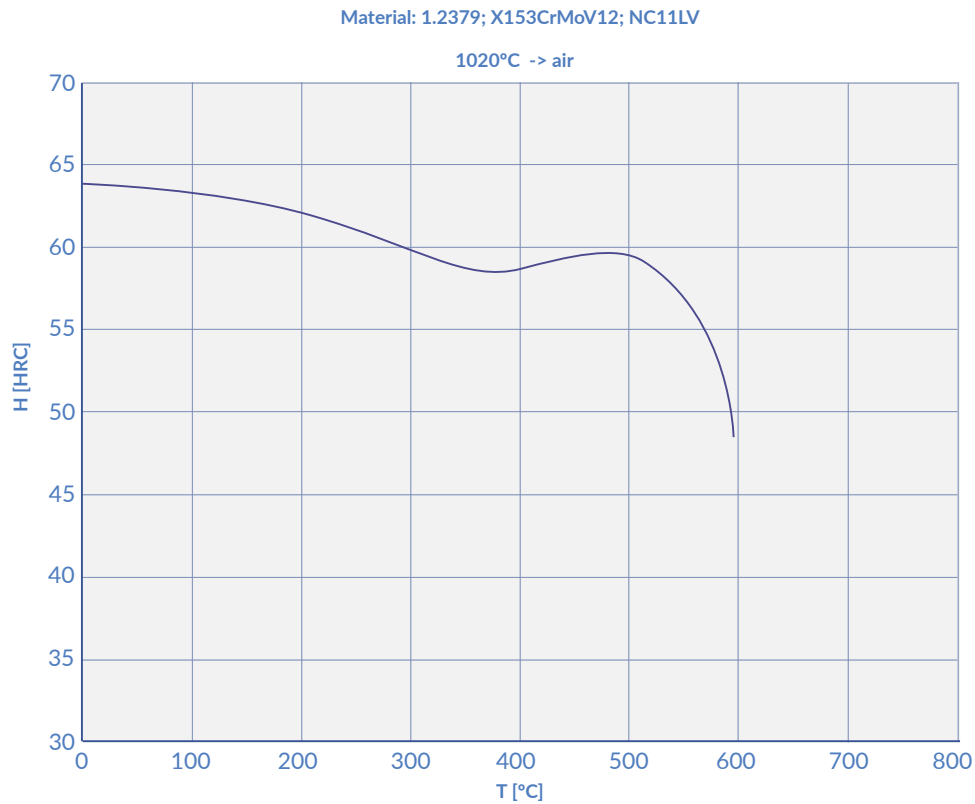
## MECHANICAL PROPERTIES

|               |                    |
|---------------|--------------------|
| Condition     | Soft annealed (+A) |
| Hardness [HB] | max. 255           |

## CONTINUOUS COOLING TRANSFORMATION (CCT) DIAGRAM



## TEMPERING DIAGRAM



**NOTE:** All technical information is for reference only.