ATT 2379

CHEMICAL ANALYSIS (PERCENTAGE BY MASS)

	C	Si	Cr	Mo	V
Guide analysis	1.50	0.30	12.00	0.95	0.90

CHARACTERISTICS

ATT 2379 is a high-carbon high-chromium cold work tool steel, having high wear resistance. During work, ATT 2379 has the following behaviour:

- High resistance to abrasive or adhesive wear, in cold work applications
- Better toughness and better machinability than the higher-carbon (2% or more) AISI D types.

AISI	D2
DIN	X155 CrMoV 12-1
BS	BD 2
JIS	SKD 11
AFNOR	Z 160 CDV 12
EN	X 160 CrMoV 12 1

APPLICATIONS

ATT 2379 is largely employed in cold work tooling, in high wear resistant tools, such as

- Blanking and piercing dies, including punches and dies used to cold form metals in an stamping presses.
- Tools for press forming dies
- Deep drawing dies, thread-rolling dies, coining dies and cold heading dies
- Blades for cold shearing flat materials, with thickness up to 6 mm. Also for cold slitting up to 6.5 mm.
- Cold rolling mill rolls
- Punches and dies for cold extrusion

DELIVERED CONDITION

Annealed material is available in round, square or flat bars : 255 HB max.

PHYSICAL PROPERTIES

Density, kg/dm³ at	20°C 20°C 7.70				
Thermal Expansion (µm/m) from 20°C to	100°C 10.4	200°C 10.3	425°C 11.9	540°C 12.2	650°C 12.2

MECHANICAL PROPERTIES

Typical bend test properties of ATT 2379 are shown in the table below. It is lower than ow alloyed cold work tool steel grades. However, the toughness value is higher than that of high speed steels.

Bend strength	Total Deflection*
3 000 MPa	2.0 mm

* Values for specimens with section of 5 mm x 7 mm, taken from the mid ray of a 60 mm round bar, in longitudinal orientation. Hardness of 60 HRC.

ATT 2379

Advanced Tooling Tek Shanghai Co., Ltd.
No, 1-3, Lane 499, Xin Miao San Road, Xianqiao Town,
Songjiang Dist., Shanghai, 201612 China
Tel: +86 21 3373 8146 | Fax: +86 21 3373 8193 | info@att-metal.com

www.att-metal.com WeChat

The information contained herein is intended to provide general knowledge on our products and their uses. It should not be construed as a warranty of specific properties of the products described, or a warranty for fitness for a particular purpose. Each user of products from Advanced Tooling Tek (Shanghai) Co Ltd ("ATT") is responsible for making its own determination as to the suitability of ATT's products and services.

2020102

ATT 2379

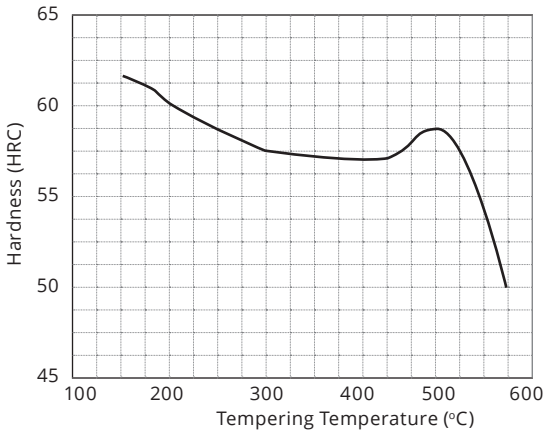
HEAT TREATMENT

Annealing: soft annealing should be carried out by heating between 870 and 900ºC for 2 hours, followed by slow cooling at 10/20ºC per hour until 650ºC and then, by air cooling. In this treatment, the use of protective atmosphere is important to avoid surface oxidation and decarburisation.

Stress relieving : Intense material removal during machining of tools can induce considerable stress, which may cause distortions after end heat treatment. In order to avoid this, a stress relieving is recommended to be applied after machining and before treating. The indicated procedure is slow heating to 500/600ºC, holding until complete homogenisation, and cooling (air or furnace) at least down to 200ºC

Hardening and Tempering : the indicated heat treatment temperatures are:

Pre-heating	Hardening	Tempering
790 - 830ºC	1000 - 1080ºC	200 - 250ºC (for higher hardness)
		500 - 600ºC (see diagram below)



After preheating, tools must be carried to another furnace, holding 30 min after soaking (after tool is fully heated throughout). Quenching may be done in:

- Salt bath at 500/550ºC
- Warm quenching oil
- Vacuumm, with high pressure circulated gas
- Air blast

Tempering temperatures should be suitable to the required hardness. If hardness around 60 HRC is necessary, tempering in low temperatures should be employed. However, if 58 HRC or less are possible, tempering at 500ºC or higher is preferable, in order to improve toughness. Double tempering is required and after each tool must cool down to room temperature. After soaking, holding time of at least 2 hours is necessary.

SURFACE TREATMENT

ATT 2379 is an adequate substrate for nitriding. As nitriding temperature is normally higher than 500ºC, core hardness of nitrided tools is normally limited to 57 HRC. This fact can restrict nitriding application in some applications.

PVD or CVD coatings are also available to be applied in ATT 2379 if desired. The same precautionary note on treatment temperature and loss in core hardness is also important in this case.