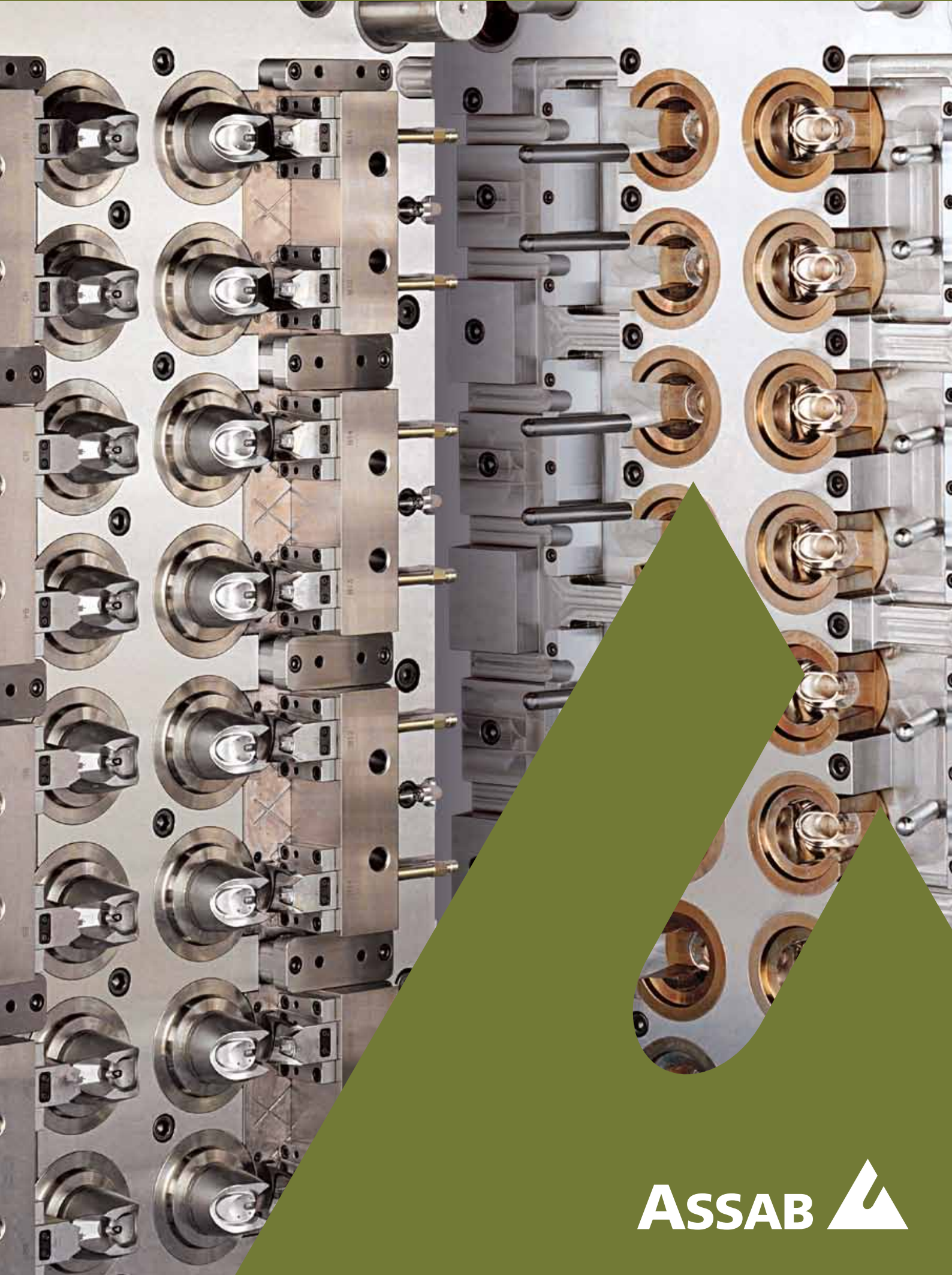


# ASSAB 518



## General

ASSAB 518 is a vacuum-degassed Cr-Mo alloy steel, supplied in prehardened condition and normally does not require further heat treatment. This eliminates the risks, cost and waiting time of heat treatment and avoids the associated possibility of distortion or even cracking. Subsequent modifications can easily be carried out.

Typical analysis %	C 0.40	Si 0.3	Mn 1.4	Cr 1.9	Mo 0.2
Standard specification	AISI P20, WNr. 1.2311, DIN 40CrMnMo7				
Delivery condition	Hardened and tempered to 290 - 330 HB				
Colour code	Blue / Pink				

ASSAB 518 is manufactured to high-quality standards with the following characteristics:

- Good homogeneity and uniform hardness
- Good machinability
- Good polishing and photo-etching properties
- Good weldability
- Suitable for all nitriding processes, hard-chromium plating, PVD coating as well as case hardening (e.g., carburising)
- 100% ultrasonic tested

## Applications

- Injection moulds for thermoplastics
- Extrusion dies for thermoplastics
- Blow moulds
- Mould / die frames and holders
- Machine and structural components (e.g. shafts, gears, hammers, etc.)

## Properties

### PHYSICAL AND MECHANICAL DATA

Unless otherwise specified, the data are approximate values in the as-delivered condition at ambient temperature.

Density : 7800 kg/m<sup>3</sup>

Modulus of elasticity : 205,000 N/mm<sup>2</sup>

Tensile strength, R<sub>m</sub> : 1050 N/mm<sup>2</sup>

Yield strength, R<sub>p0.2</sub> : 900 N/mm<sup>2</sup>

Compressive yield strength, R<sub>c0.2</sub> : 950 N/mm<sup>2</sup>

Temperature	20°C	200°C	400°C
Coefficient of thermal expansion, per °C from 20°C	–	13.1 × 10 <sup>-6</sup>	14.0 × 10 <sup>-6</sup>
Thermal conductivity, W/m°C	34.0	33.6	29.5

## Heat treatment

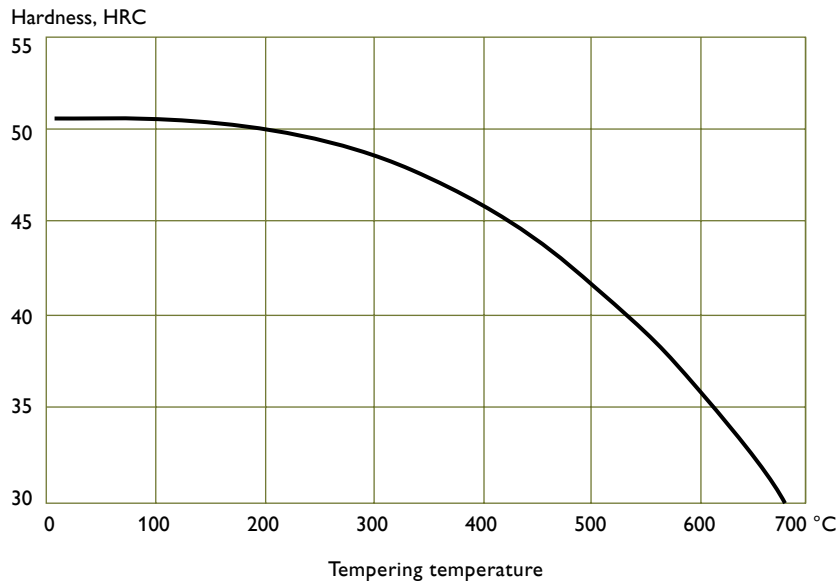
Process	Temperature	Soaking time*	Cooling	Hardness
Stress relieving	~550°C	120 min	Furnace cooling	–
Soft annealing	~720 °C	60 - 120 min	Slow cooling in furnace	–
Hardening	840 - 880°C	30 - 60 min	Oil, hot bath (180 - 220°C)	Max. 52 HRC
Tempering (Ø25 mm, 850°C, oil quenched)	200°C	400°C	500 °C	600 °C
	50 HRC	46 HRC	42 HRC	36 HRC

\* Soaking time = Time at temperature after the tool is fully heated through.

This information is based on our present state of knowledge and is intended to provide general notes on our products and their uses. It should not therefore be construed as a warranty of specific properties of the products described or a warranty for fitness for a particular purpose.

### Tempering graph

The curve shown in the tempering graph is valid for Ø25 mm samples, austenitised at 850°C and quenched in oil.



## Surface treatment

### FLAME AND INDUCTION HARDENING

ASSAB 518 can be flame or induction hardened to a hardness of approx. 50 HRC. Cooling in air is preferable. Smaller pieces may however require forced cooling. Hardening should be immediately followed by tempering.

### NITRIDING

Mould machined from ASSAB 518 may be nitrided to give a hard surface which is very resistant to wear and erosion. A nitrided surface also increases the corrosion resistance. The surface hardness after gas nitriding at 525°C in ammonia gas will be approximately 650 HV with the following case depth:

#### Depth of nitriding

Temperature °C	Time h	Depth* mm
525	20	0.30
525	30	0.35
525	60	0.50

\*Nitriding depth is the distance from the surface where hardness is 50 HV higher than the matrix hardness.

Gas nitrocarburising at 570°C will give a surface hardness of approx. 700 HV. After 2 hours treatment, the case depth will be approx. 0.10 mm.

### HARD CHROME PLATING

After hard-chromium plating, the tool should be tempered for approx. 4 hours at 180°C within 4 hours of plating in order to avoid hydrogen embrittlement.

## Welding

Welding method	TIG	MMA (SMAW)
Working temperature	200 - 250°C	200 - 250°C
Filler material	718 TIG-Weld	718 Weld
Hardness after welding	300 - 330 HB	300 - 330 HB
Post-weld treatment	Temper at approx. 550°C for 2 hr	

## Further information

For further information, i.e., steel selection, heat treatment, application and availability, please contact our ASSAB office\* nearest to you.

\*See back cover page.

**GROUP HEAD OFFICE**

ASSAB Pacific Pte. Ltd.  
171 Chin Swee Road  
#07-02 SAN Centre  
Singapore 169877  
Tel : 65 6534 5588  
Fax : 65 6534 0655

**CHINA**

**Beijing\***  
ASSAB Tooling (Beijing) Co., Ltd.  
10A Rong Jing Dong Jie  
Beijing Economic & Tech. Development Area (BDA)  
Beijing 100176, China  
Tel : 86 10 6786 5588  
Fax : 86 10 6786 2988

**Changzhou\***  
288 Tongjiang Road, Xinbei District  
Building 2, A2803, Daosheng Center  
Changzhou 213022, China  
Tel : 86 519 8512 3731  
Fax : 86 519 8512 3732

**Chongqing\***  
ASSAB Tooling Technology (Chongqing) Co., Ltd.  
C Plant, Automotive Industrial Park  
Chongqing Economic & Tech. Development Zone  
Chongqing 401120, China  
Tel : 86 23 6745 5698  
Fax : 86 23 6745 5699

**Dalian\***  
9-2 Mould Workshop, 26 Industrial Zone  
Dalian Economic & Technological Development Zone  
Dalian 116600, China  
Tel : 86 411 8761 8080  
Fax : 86 411 8761 9595

**Dongguan\***  
ASSAB Tooling (Dong Guan) Co., Ltd.  
No. 3, Gongye North 1 Road,  
Dongguan Songshan Lake National High-tech  
Industrial Development Zone  
Dongguan 523808, China  
Tel : 86 769 2289 7888  
Fax : 86 769 2289 9312

**Ningbo\***  
ASSAB Tooling Technology (Ningbo) Co., Ltd.  
218 Longjiaoshan Road, Vehicle Part Industrial Road  
Ningbo Economic & Tech. Development Zone  
Ningbo 315806, China  
Tel : 86 574 8680 7188  
Fax : 86 574 8680 7166

**Qingdao\***  
ASSAB Tooling (Qingdao) Co., Ltd.  
8 Yi Sheng Bai Road  
Jimo Environmental Protection Industrial Zone  
Ningbo 315806, China  
Tel : 86 532 8752 9999  
Fax : 86 532 8752 9588

**Shanghai\***  
ASSAB Tooling Technology (Shanghai) Co., Ltd.  
4088 Humin Road  
Xinzhuang Industrial Zone  
Shanghai 201108, China  
Tel : 86 21 2416 9688  
Fax : 86 21 2416 9738

**Suzhou\***  
220 Xinghai Street, Suzhou Industrial Park  
Room 801, Xinghai International Plaza  
Suzhou 215021, China  
Tel : 86 512 6900 0161  
Fax : 86 512 6252 9227

**Tianjin\***  
505 B Haitai Xinxin Plaza  
Huayuan Chanye Jidi, Nankai District  
Tianjin 300384, China  
Tel : 86 22 2370 7808  
Fax : 86 22 2370 7806

**Xiamen\***  
ASSAB Tooling (Xiamen) Co., Ltd.  
Eastern Wing, 1/F, Universal Workshop, 30 Huli Zone  
Xiamen 361006, China  
Tel : 86 592 562 4678  
Fax : 86 592 568 3703

*Other offices in Changchun, Hangzhou, Shenyang and Xi'an.*

**HONG KONG\***

ASSAB Steels (HK) Ltd.  
Room 1701-1703  
Grand Central Plaza, Tower 2  
138 Shatin Rural Committee Road  
Shatin, N.T., Hong Kong  
Tel : 852 2487 1991  
Fax : 852 2489 0938

**INDONESIA**

**Jakarta\***  
PT. ASSAB Steels Indonesia  
Jl. Rawagelam III No. 5  
Kawansan Industri Pulogadung  
Jakarta 13930, Indonesia  
Tel : 62 21 461 1314  
Fax : 62 21 461 1306

**Medan\***  
Jl. Sunggal No. 159, Tanjung Rejo  
Medan 20122  
North Sumatera, Indonesia  
Tel : 62 21 847 7935  
Fax : 62 21 847 7936

**Surabaya\***  
Jl. Berbek Industri I/23  
Surabaya Industrial Estate  
Rungkut  
Surabaya 60293  
East Jaya, Indonesia  
Tel : 62 31 849 9606  
Fax : 62 31 843 2040

*Other offices in Bandung, Cikarang, Semarang and Tangerang.*

**JAPAN**

**Tokyo\***  
Bohler-Uddeholm KK  
Bancho M Buildkng 4F  
2-8 Rokubancho, Chiyoda-ku  
Tokyo 102-0085, Japan  
Tel : 81 3 5226 3771  
Fax : 81 3 5226 6110

**Fukuroi\***  
1777-1 Muramatsu, Fukuroi-shi  
Shizuoka 437-0011, Japan  
Tel : 81 538 43 9240  
Fax : 81 538 43 9244

**Nagoya\***  
Sumitomo Seimei Chikusa  
New Tower Building  
3-15-31 Aoi, Higashi-ku, Nagoya,  
Aichi 461-0004, Japan  
Tel : 81 52 979 5081  
Fax : 81 52 933 6461

**Osaka\***  
Shin Osaka Prime Tower  
6-1-1 Nishinakajima, Yodogawa-ku  
Osaka 532-0011, Japan  
Tel : 81 6 6307 7621  
Fax : 81 6 6307 7627

**KOREA**

**Incheon\***  
ASSAB Steels (Korea) Co., Ltd.  
116B-8L, 687-8, Kojang-dong,  
Namdong-ku  
Incheon 405-310, Korea  
Tel : 82 32 821 4300  
Fax : 82 32 821 3311

**Busan\***  
14B-5L, 1483-9, Songjeong-dong,  
Kangseo-ku  
Busan 618-270, Korea  
Tel : 82 51 831 3315  
Fax : 82 51 831 3319

**Daegu\***  
720-2, Geomdan-dong, Buk-gu  
Daegu 702-030, Korea  
Tel : 82 53 384 3315  
Fax : 82 53 384 3317

**MALAYSIA**

**Head Office / KL Sales\***  
ASSAB Steels (Malaysia) Sdn. Bhd.  
Lot 19, Jalan Perusahaan 2  
Batu Caves Industrial Estate  
68100 Batu Caves  
Selangor, Malaysia  
Tel : 60 3 6189 0022  
Fax : 60 3 6189 0044 / 55

**Butterworth\***  
Plot 146a  
Jalan Perindustrial Bukit Minyak 7  
Kawasan Perindustrial Bukit Minyak  
14000 Bukit Mertajam  
SPT Penang, Malaysia  
Tel : 60 4 507 2020  
Fax : 60 4 507 6323

**Johor\***  
8 Jalan Pesiaran Teknologi  
Taman Teknologi Johor  
81400 Senai  
Johor, Malaysia  
Tel : 60 7 598 0011  
Fax : 60 7 599 4809

**PHILIPPINES**

**Laguna\***  
ASSAB Pacific Pte. Ltd. - Philippine Branch  
Blk 2, Lot 4 Interstar corner Solid Streets  
Laguna International Industrial Park (LIIP)  
Mamplasan, Biñan, Laguna  
4024 Philippines  
Tel : 63 49 539 0441 / 42  
Fax : 63 49 539 1075

*Another office in Cebu.*

**SINGAPORE\***

ASSAB Steels Singapore (Pte.) Ltd.  
18 Penjuru Close  
Singapore 608616  
Tel : 65 6862 2200  
Fax : 65 6862 0162

**TAIWAN**

**Taipei\***  
ASSAB Steels Taiwan Co., Ltd.  
No. 112, Wu Kung 1st Road  
New Taipei Industrial Park  
Wu Ku District, New Taipei City  
Taipei 248-87, Taiwan  
Tel : 886 2 2299 2849  
Fax : 886 2 2299 0147 / 2348

**Kaoshiung\***  
No. 1, Bangong West 3rd Road  
Gangshan Benzhou Industrial Park  
Kaoshiung 820-59, Taiwan  
Tel : 886 7 624 6600  
Fax : 886 7 624 0012 / 16

**Nantou\***  
No. 10, Industry South 5th Road  
Nan Kang Industry Zone  
Nantou 540-66, Taiwan  
Tel : 886 49 225 1702  
Fax : 886 49 225 3173

**THAILAND\***

ASSAB Steels (Thailand) Ltd.  
9/8 Soi Theedinthai, Taeparak Road,  
Bangplee, Samutprakarn 10540  
Tel : 66 2 385 5937  
66 2 757 5017  
Fax : 66 2 385 5936  
66 2 385 5943

**VIETNAM\***

ASSAB Steels Vietnam Co., Ltd.  
Plot 101/2-1, Road 3B,  
Amata Industrial Zone  
Bien Hoa City, Dong Nai, Vietnam  
Tel : 84 61 8899 099  
Fax : 84 61 8899 191

*\* Sales office with warehouse and/or value-added services*

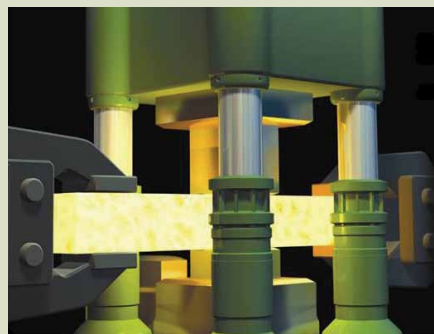
*† Sales office only*

ASSAB TOOL STEELS have been in Asia since 1945. Our customers associate ASSAB brand with tooling materials that are high in quality and consistency.

The ASSAB sales companies and distributors offer you well-assorted stocks in a number of places covering the Asia-Pacific region. To further shorten the lead time, ASSAB will mill, grind, drill and even wire-cut the tool steel to meet your requirements. ASSAB also provides state-of-the-art vacuum heat treatment services to enhance the steel properties.

Our engineers and metallurgists are always ready to assist you in your choice of the optimum steel grade and the best treatment for each application. We always carry out material examinations at our local mini laboratories and at the central laboratory in Sweden.

Our steel mill in Sweden, Uddeholms AB, is one of the few steelworks in the world that is dedicated to the manufacture of tool steels only. Uddeholms AB is certified to ISO 9001 and ISO 14001.



Our forging press is one of the most modern of its kind in the world.

Besides tool steels, the ASSAB products and business areas also include:

- Welding electrodes for repair welding of tools
- High-strength aluminium for tooling purposes
- Copper alloys (e.g., beryllium copper) for inserts in moulds
- Alloy machinery steels
- Cold-rolled strip steels for saws, compressor valves, coater blades, etc
- Component business (e.g., shafts and recycling knives)