

# ACEROS RÁPIDOS

## Formatos disponibles

Productos largos

## Descripción

### BÖHLER S601 - "El acero rápido"

Acero ideal para fresas, brocas y machos de roscar, brochas y herramientas de trabajo en frío. BÖHLER S601 es uno de los aceros rápidos más utilizados y es el material básico para nuestros clientes que consumen acero rápido.

## Método de obtención

Convencional

## Propiedades

- > Dureza y Ductilidad : alto
- > Resistencia al desgaste : alto
- > Resistencia a la compresión : alto
- > Estabilidad de los bordes : alto
- > Afilabilidad : alto
- > Dureza en caliente (dureza roja) : alto

## Aplicaciones

- > Hojas para sierras
- > Compactación de polvo
- > Componentes de desgaste
- > Conformado en frío / acuñado
- > Laminación
- > Corte fino / Troquelado / Estampado
- > Cizallas / Cuchillas

## Datos técnicos

| Designación |      | Estándares |        |
|-------------|------|------------|--------|
| 1.3339      | SEL  | 4957       | EN ISO |
| HS6-5-2     | EN   | G4403      | JIS    |
| SKH51       | JIS  |            |        |
| M2          | AISI |            |        |

## Composición Química

| C    | Si   | Mn   | Cr  | Mo | V   | W   |
|------|------|------|-----|----|-----|-----|
| 0,85 | 0,35 | 0,25 | 4,1 | 5  | 1,9 | 6,4 |

## Características

|                    | Resistencia a la compresión | Aptitud para el rectificado | Dureza en caliente | Tenacidad | Resistencia al desgaste | Retención del filo de la navaja |
|--------------------|-----------------------------|-----------------------------|--------------------|-----------|-------------------------|---------------------------------|
| <b>BÖHLER S601</b> | ★★★                         | ★★★                         | ★★★                | ★★        | ★★                      | ★★★                             |
| <b>BÖHLER S200</b> | ★★★                         | ★★                          | ★★★                | ★★        | ★★★                     | ★★                              |
| <b>BÖHLER S400</b> | ★★★                         | ★★★                         | ★★★                | ★★★       | ★★                      | ★★                              |
| <b>BÖHLER S401</b> | ★★                          | ★★★                         | ★★                 | ★★★       | ★★                      | ★★★                             |
| <b>BÖHLER S404</b> | ★★                          | ★★★                         | ★★                 | ★★★       | ★★                      | ★★                              |
| <b>BÖHLER S430</b> | ★★                          | ★★★                         | ★★                 | ★★★       | ★★                      | ★★                              |
| <b>BÖHLER S500</b> | ★★★★                        | ★★★                         | ★★★★               | ★★        | ★★★                     | ★★★                             |
| <b>BÖHLER S600</b> | ★★★                         | ★★★                         | ★★★                | ★★        | ★★                      | ★★★                             |
| <b>BÖHLER S607</b> | ★★★                         | ★★★                         | ★★★                | ★★        | ★★★                     | ★★★                             |
| <b>BÖHLER S630</b> | ★★★                         | ★★★                         | ★★★                | ★★        | ★★                      | ★★★                             |
| <b>BÖHLER S705</b> | ★★★                         | ★★★                         | ★★★★               | ★★        | ★★                      | ★★★★                            |
| <b>BÖHLER S730</b> | ★★★                         | ★★★                         | ★★★★               | ★★        | ★★                      | ★★★★                            |

## Estado de suministro

### recocido

|             |          |
|-------------|----------|
| Dureza (HB) | máx. 280 |
|-------------|----------|

## Tratamiento térmico

### Recocido

|             |              |  |
|-------------|--------------|--|
| Temperatura | 770 a 840 °C | Controlled slow cooling in furnace (10 - 20°C / h (50 - 68°F / h)) to approx. 600°C (1110°F), air cooling. |
|-------------|--------------|--|

### Alivio de tensiones

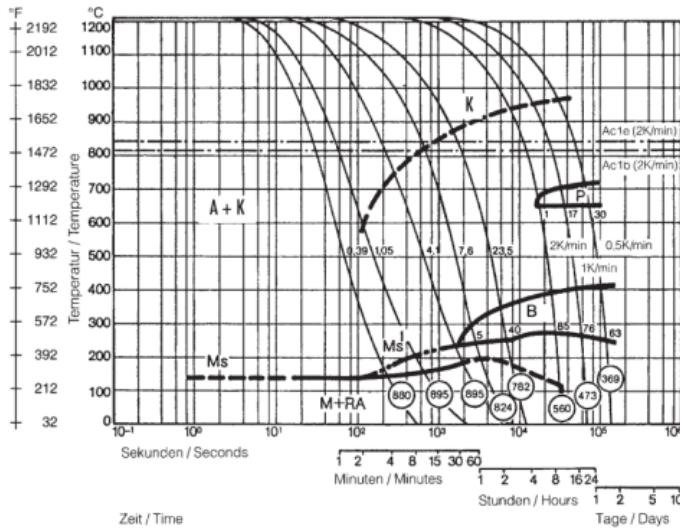
|             |              |   |
|-------------|--------------|---|
| Temperatura | 600 a 650 °C | Slow cooling furnace.    To relieve stresses set up by extensive machining or in tools of intricate shape.    After through heating, hold in neutral atmosphere for 1 to 2 hours. |
|-------------|--------------|---|

### Temple y revenido

|             |                  |   |
|-------------|------------------|---|
| Temperatura | 1.190 a 1.230 °C | Salt bath, vacuum    Preheating: 1st stage ~ 500 °C, 2nd stage ~ 850 °C, 3rd stage ~1050 °C    Austenitising: 1190 - 1230 °C, holding time after complete heating 80 seconds, maximum 150 seconds, to avoid material damage due to overheating.   Quenching: oil, warm bath (500 - 550 °C), gas |
|-------------|------------------|---|

|             |              |   |
|-------------|--------------|---|
| Temperatura | 550 a 570 °C | Slow heating to tempering temperature immediately after austenitising.    Dwell time in the furnace 1 hour per 20 mm material thickness (at least 1 hour)    Slow cooling to room temperature    3 tempering cycles recommended    Hardness see tempering chart |
|-------------|--------------|---|

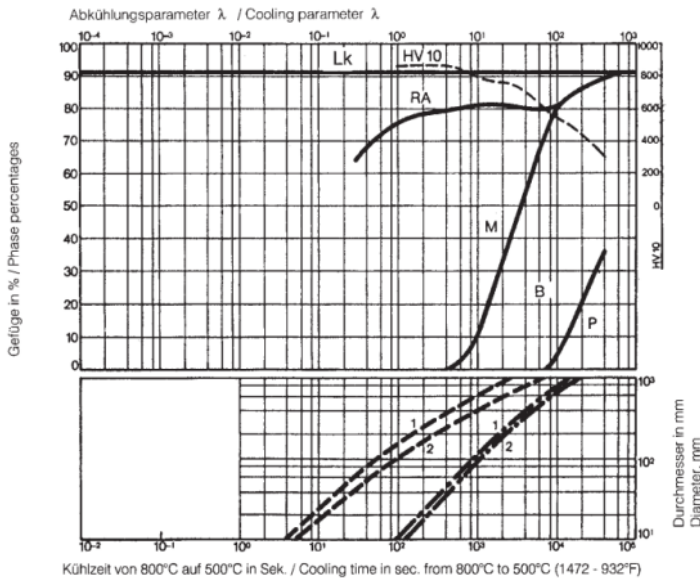
Continuous cooling CCT curves



Austenitising temperature: 1210°C (2210°F)  
Holding time: 180 seconds

- A....Austenite
- B....Bainite
- K....Carbide
- P....Pearlite
- M....Martensite
- RA...Retained Austenite

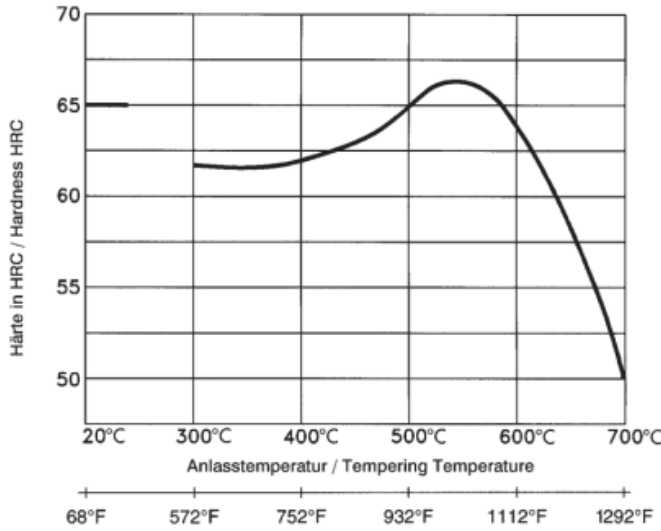
Quantitative phase diagram



- A....Austenite
- B....Bainite
- K....Carbide
- P....Pearlite
- M....Martensite
- RA...Retained Austenite

- 1...Edge or Face
- 2...Core
- 3...Jominy test: distance from quenched end

### Tempering Chart



Hardening temperature: 1220°C (2228°F)

Holding time 3 x 2 hours  
Specimen size: square 25 mm

### Propiedades físicas

|  |      |
|--|------|
| Temperatura (°C)   | 20   |
| Densidad (kg/dm <sup>3</sup> )                             | 8,1  |
| Conductividad térmica (W/(m.K))                            | 19   |
| Calor específico (kJ/kg K)                                 | 0,46 |
| Resistencia eléctrica específica (Ohm.mm <sup>2</sup> /m)  | 0,54 |
| Módulo de elasticidad (10 <sup>3</sup> N/mm <sup>2</sup> ) | 217  |

### Expansión térmica

| Temperatura (°C)                             | 100  | 200  | 300  | 400  | 500  | 600 | 700  |
|--|------|------|------|------|------|-----|------|
| Expansión térmica (10 <sup>-6</sup> m/(m.K)) | 11,5 | 11,7 | 12,2 | 12,4 | 12,7 | 13  | 12,9 |

For additional specifications and technical requirements, please contact our regional voestalpine BÖHLER sales companies.

*The data contained in this brochure is merely for general information and therefore shall not be binding on the company. We may be bound only through a contract explicitly stipulating such data as binding. Measurement data are laboratory values and can deviate from practical analyses. The manufacture of our products does not involve the use of substances detrimental to health or to the ozone layer.*

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**voestalpine**

ONE STEP AHEAD.