



Metal forming tools made of
high-quality alloyed steel grades for

Roller Dies and Tooling



Metal forming tools made of high-quality alloyed steel grades for

Roller Dies and Tooling

Kind & Co., provides modern material solutions, engineering consultation and ready-to-use forming tools for the following products:

- push bench rolls, piercing rolls, piercing mandrels, piercing dies
- copper rod rolls
- conform wheels
- cold pilger dies, cold pilger mandrels
- straightening rolls
- drawing rolls, drawing mandrels

Kind&Co

For over 130 years, we have been producing high-quality tool steel exclusively at our site in Bielstein. Kind&Co is still a family owned business today. We stand for sophisticated material solutions, highest quality, reliable service and competent advice - tailored to the respective application. We have particularly strong application expertise in the areas of die casting, extrusion and die forging.



Pipe Technology

The pipe technology segment comprises various products for the production of welded pipes, seamless pipes, profiles and wires. These products are used in the following areas:

- Push bench systems for the production of seamless tubes
- Plants for the production of copper wire
- Cold pilger rolling mills for the reduction of seamless tubes
- Straightening machines for straightening tubes and rods
- Plants for the production of seamless gas cylinders
- Pipe welding plants

The required forming tools are made from forged, hot work tool steels, characterized by their outstanding toughness properties, high temperature strength and wear resistance. Kind & Co. has developed a variety of premium steel grades, which have proven to be very effective in regards to delivering a great performance and increasing service life, when compared to standard grades. TQ1, HP1 and CS1 are being used, with great success, in metal forming plants worldwide.

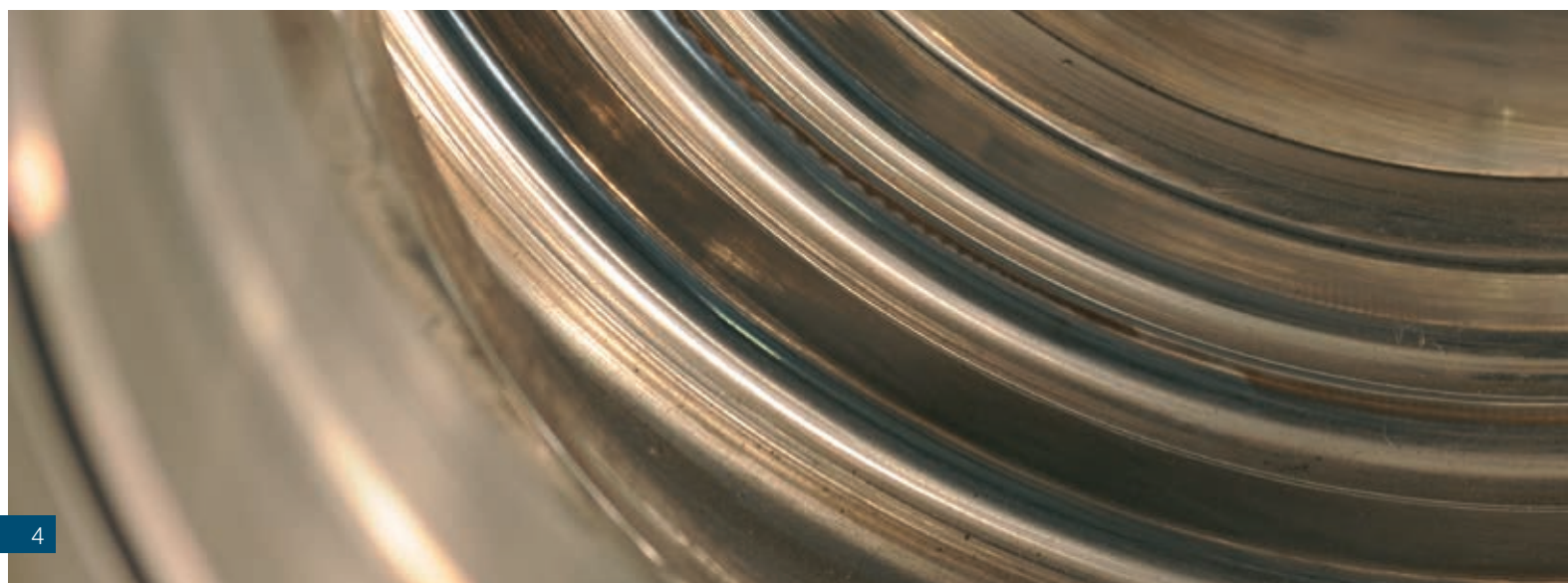
We will be delighted to help you further improve the performance of your forming process. Our application engineers are glad to support you with help and advice. Feel free to get in touch with us.



Main materials used for tooling in pipe technology

● Good Standard ● Premium ● Nickel-Based

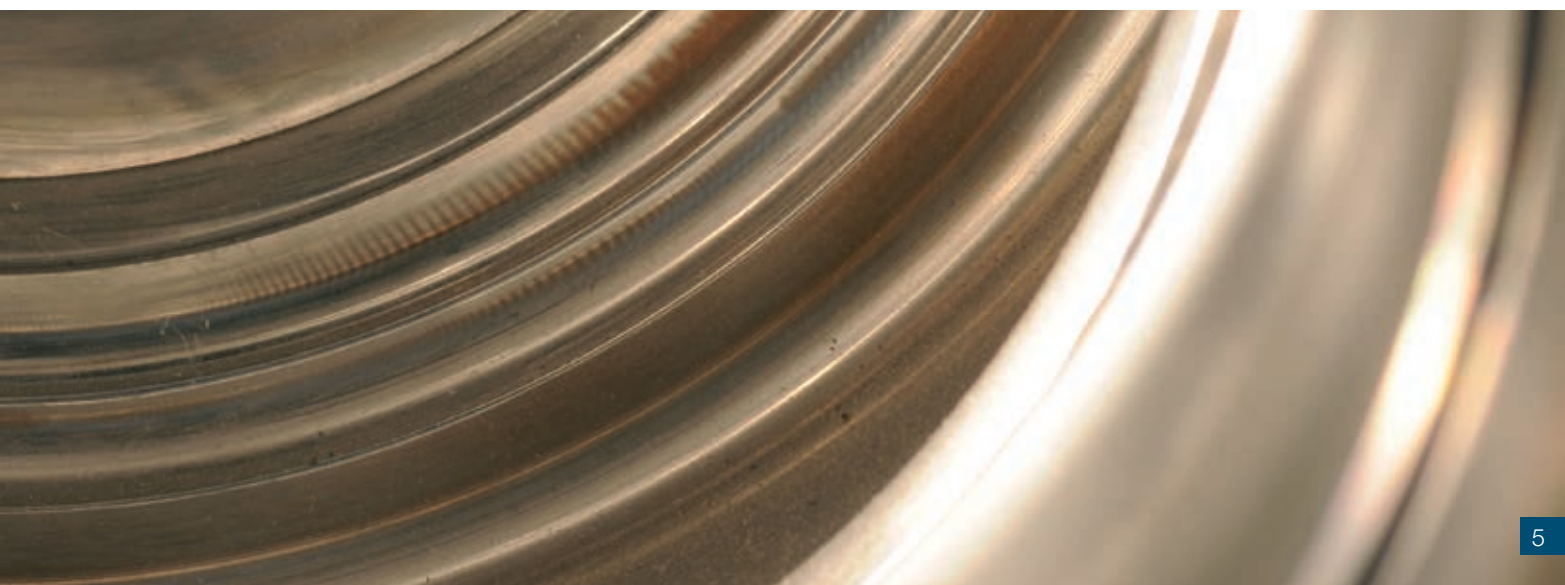
Brand name		Mat. no.	Short name	AISI	Typical analysis % by weight								
					C	Si	Mn	Cr	Mo	V	Ni	Additional elements	
CH16V	Cold-work Tool Steel	1.2379	X153CrMoV12	D2	1.50	0.25	0.25	11.25	0.80	0.85	-	-	
N400		1.2767	45NiCrMo16	-	0.45	0.25	0.40	1.35	0.25	-	4.00	-	
PM823		spezial	-	-	-	0.84	0.85	0.35	7.70	1.50	2.45	-	-
USD	Hot-work Tool Steel	1.2344	X40CrMoV5-1	H 13	0.40	1.00	0.40	5.20	1.30	1.00	-	-	
USD-H		1.2345	X50CrMoV5-1	-	0.51	0.85	0.30	4.90	1.35	0.90	-	-	
USN		1.2343	X37CrMoV5-1	H 11	0.37	1.00	0.40	5.20	1.20	0.40	-	-	
RP		1.2365	32CrMoV12-28	H 10	0.32	0.40	0.40	3.00	2.80	0.50	-	-	
CR7V-L		special	-	-	-	0.42	0.50	0.40	6.50	1.30	0.80	-	-
UH1		special	-	-	-	0.46	0.45	0.50	6.70	1.50	0.80	-	-
CS1		special	-	-	-	0.50	0.30	0.40	5.00	1.90	0.55	-	+Nb
GSF		special	-	-	-	0.28	0.30	0.70	2.80	0.60	0.40	1.00	-
HP1		special	-	-	-	0.35	0.20	0.30	5.20	1.40	0.55	-	+Nb
HS1		special	-	-	-	0.50	0.90	0.80	8.00	1.50	1.70	-	-
TQ1/Q10	special	-	-	-	0.36	0.25	0.40	5.20	1.90	0.55	-	-	
SA718		2.4668	NiCr19Fe19Nb5Mo3	-	0.05	≤ 0.35	≤ 0.35	19.00	3.00	-	53.00	Al 0,50; Ti 0,90; Rest Fe; Nb 5%	



Material properties

● Good Standard
 ● Premium
 ● Nickel-Based

Brand name		Toughness	Temperature resistance	Abrasive wear resistance	Thermo-shock resistance	
CH16V	Cold-work Tool Steel	●○○○○○		●●●●●○		
N400		●●●○○○		●●○○○○		
PM823		●●○○○○○		●●●●●○		
USD	Hot-work Tool Steel	●●●○○○	●●●●●○	●●●●●○	●●●○○○	
USD-H		●●●●●○	●●●●●○	●●○○○○	●●●○○○	
USN		●●●●●○	●●●●●○	●●●○○○	●●●○○○	
RP		●●●○○○	●●●●●○	●●●○○○	●●●○○○	
CR7V-L		●●●○○○	●●●●●○	●●●●●○	●●●○○○	
UH1		●●●○○○	●●●●●○	●●●●●○	●●●○○○	
CS1		●●●●●○	●●●●●○	●●●●●○	●●●○○○	
GSF		●●●○○○	●●○○○○	●●○○○○	●●●○○○	
HP1		●●●●●○	●●●○○○	●●●○○○	●●●○○○	
HS1		●●○○○○○	●●○○○○○	●●●●●○	●●●○○○	
TQ1/Q10		●●●●●●	●●●●●○	●●●●●○	●●●○○○	
SA718			●●●●●○	●●●●●●	●●●●●○	●●●○○○



Selection of the most important tool steel recommendations with installation hardness for each product for pipe technology

● Good Standard ● Premium ● Nickel-Based

Designation	Required properties	Material Hardness	Material Hardness
Copper rod rolls	Toughness Temperature resistance	RP-ESU 46 - 48 HRc Stand 0 - 3	TQ1 46 - 48 HRc Stand 0 - 3
Conform wheels	Toughness Temperature resistance	TQ1 47 - 49 HRc	TQ1 50 - 52 HRc
Piercing mandrels	Wear resistance	PWM 1180 - 1320 MPa	CR7V-L 1250 - 1400 MPa
Piercing dies	Thermo-shock resistance	RP 44 - 46 HRc	CR7V-L 50-52 HRc
Cold pilger mandrels	Toughness Wear resistance	N400 52 - 54 HRc	USD 50 - 52 HRc
Cold pilger dies	Toughness Wear resistance	USD 52 - 54 HRc	TQ1 52 - 54 HRc
Straightening rolls	Toughness Wear resistance	CH16V 60 - 62 HRc Axle 32 - 44 HRc	CH16V 60 - 62 HRc 2 parts
Piercing rolls	Toughness Thermo-shock resistance	USN 39 - 41 HRc	USD 39 - 41 HRc
Push bench rolls	Wear resistance Thermo-shock resistance	RP 44 - 46,5 HRc	USD-H ESU 51 - 53 HRc
Drawing mandrels	Toughness Wear resistance	RP 1050 - 1150 MPa	Q10 1130 - 1300 MPa
Drawing rolls	Toughness Wear resistance	CR7V-L 57 - 60 HRc Flame-Hardened	

Material Hardness	Material Hardness	Material Hardness	Material Hardness
TQ1 50 - 52 HRc Stand 4 - 15	CS1 52 - 54 HRc Stand 4 - 7	HP1 50 - 52 HRc Stand 8 - 15	
SA 718 1250 - 1400 MPa	CS1 53 - 55 HRc		
CS1 52 - 54 HRc	TQ1 51 - 53 HRc		
CS1 54 - 57 HRc	CR7V-L Pre-hardened 30 - 33 HRc 56 - 59 HRc Flame-Hardened	CH16V Pre-hardened 30 - 33 HRc 60 - 62 HRc Flame-Hardened	CH16V Pre-hardened 30 - 33 HRc 58 - 60 HRc Flame-Hardened
CR7V-L 55 - 58 HRc Flame-Hardened	HS1 56 - 58 HRc Shaft 32 - 44 HRc		
HP1 39 - 41 HRc			
CH16V 54 - 56 HRc			
HP1 36 - 42 HRc			

Production processes

Melting

Forging

Heat treatment

Mechanical processing

Vacuum hardening

Surface treatment

Products

Hot-work tool steels

Cold-work tool steels

Die forging steels

Plastic mould steels

Industries

Die casting

Extrusion

Die forging

Pipe technology

Plastics technology

Hot-stamping

Special applications

Kind&Co., Edelstahlwerk, GmbH & Co. KG

Bielsteiner Str. 124-130 · D-51674 Wiehl

Fon. +49 (0) 22 62 / 84-0 · Fax +49 (0) 22 62 / 84-175

info@kind-co.de · www.kind-co.de