

Die Digitale Produktion Bausteine der Umsetzung

KST. 2050 Profilschleifen

SCHUMACHER
PRECISION TOOLS SINCE 1918

KATALOG NR. 125 G - GEWINDETECHNIK

Start

1.



Edition

Threading Technology

Products | Applications | Digital Services

Catalogue No. 125 G Threading Technology

Products | Applications | Digital Services



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product range design



geometry development



fully-automated measurement process for new developments

Research & Development

Research and Development focuses on two crucial areas: tool know-how and machining technology by **Schumacher Precision Tools (SPT)** and systems for digital process control in small and medium-sized enterprises by **GAP (Gesellschaft für angewandte Prozesslenkung)**.

For the development of new machining technology, **Schumacher** utilizes the standardized product technology database of the module **ToolDesign**, which contains more than 20,000 tool variants. This technology can be used for both new designs and ongoing developments, drawing upon algorithms. CAD-variant construction will be deployed for the respective tool models.

Schumacher can rely on an established network of renowned institutions in research disciplines such as high-speed steel and carbide substrates, heat and surface treatment, or hard material coating.

The management and technology modules developed by **GAP** in cooperation with technical universities ensure a consistent digital networking within the company. Data base-oriented product design with the module **ToolDesign** combined with the digital control system of the module **ToolProduction** fulfill the objectives of the government's initiative 'Industry 4.0'. **ToolProduction** represents digital process structures in production, a know-how advantage that is applied for the internal process optimization of **Schumacher Precision Tools**. Moreover, the cross-departmental nature of **ToolProduction** allows partial or complete synchronization with partner companies in designated sections.

SCHUMACHER
PRECISION TOOLS SINCE 1918

GAP
Gesellschaft für angewandte Prozesslenkung

RWTH AACHEN
UNIVERSITY

research cooperation with
various technical universities



R&D
by Schumacher



ToolProduction
by Schumacher



DigitalProcessPlanning
by Schumacher



Revolution in der Prozesslenkung

Supporting Digital Production



ToolProduction
by Schumacher



DigitalProcessPlanning
by Schumacher

GAP - ToolProduction

1. integrated
user interface
GAP / SPT



2. IT modules

ERP

MES

CAD

CAQ

CAX

N.N.

3. Standardised
data platform

Data architecture - concept for standardising all product and process data

Number generator, algorithms, interface definition, transformation, import, export

4. 8-platform strategy

P1

P2

P3

P4

P5

P6

P7

P8

Manufacturer

Key Accounts

System Partner

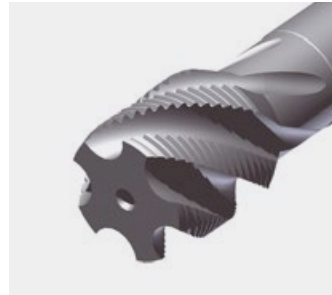
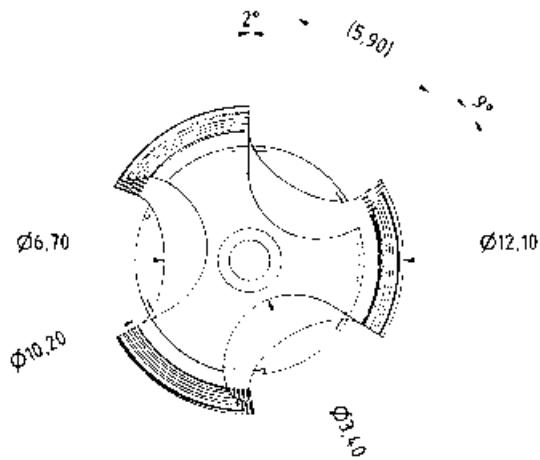


Practical solution approach
for industrial SMEs

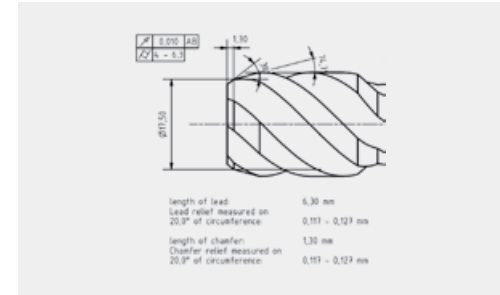
Data Integration & Resource Efficiency

Due to the political and economic framework conditions, resource conservation in all its facets is becoming increasingly important.

- › **The introduction** of cross-divisional digital process control is an obvious choice due to its high efficiency and holistic nature for conserving all resources in industrial processes.
- › **To increase this efficiency**, the use of artificial intelligence can achieve additional positive effects. For such a development in the SME class of companies considered here, however, the prerequisites for the realisation of digital process control must be planned with targeted solution approaches.
- › **he integration of different IT modules for a control system is a major challenge in this class of company.** Data integration is also a key success factor in order to ensure comprehensive process flows between the necessary standard IT modules - not least for AI applications. If this integration is not successful across all areas, redundancies arise which, in the view of the experts, would thwart all the prerequisites for successful digitalisation.



3D model precision tool



Drawing detail

CAD-construction using algorithms
and methods of variant construction

Design & Simulation

The ToolDesign Principle

The objective:

The GAP-module **ToolDesign** supports and automatizes the development, construction, production, and administration of rotation-symmetric precision tools.

ToolDesign serves as the core of Schumacher's process control in the **ToolProduction** module – as overall technology hub for products and production parameters. The system is founded on the parameter-based item structure with the construction features of all available tool variants. This standardized technology structure allows the automatic generation of constructive, production-technical, and calculative framework conditions for manufacturing rotation-symmetric precision tools.



ToolDesign
by Schumacher



ToolSimulation
by Schumacher

ToolDesign – FEATURES:

- › Pricing for Quotation Management
- › Parameterized 3D-volume models
- › Production drawings
- › Data generation and transfer for CNC-production machine tools
- › Providing know-how data for B2B and B2C-Partners



ToolDesign
by Schumacher

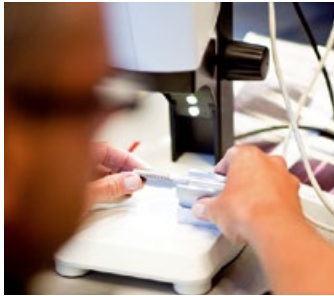


ToolSimulation
by Schumacher

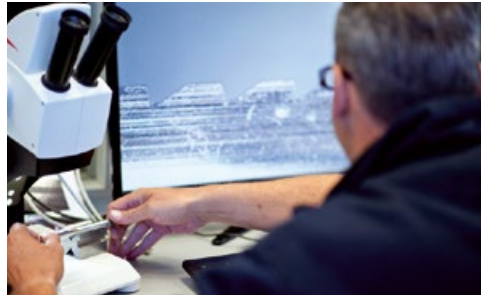
ToolSimulation – FEATURES:

- › Digital preparation of 3D volume models for simulation process
- › Data transfer of 3D volume tool models from ToolDesign
- › Development of 3D volume work piece models
- › Material classification of the work piece and tool models
- › Simulation – testing new tool variants
- › Interpretation of results

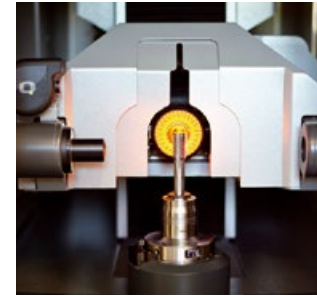




measurement process



profile inspection



digital measurement process

Simulation-based test runs before start of production increase the quality of new tool variants development

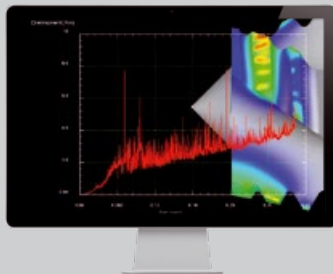
Design & Simulation

The ToolSimulation Principle

The Objective:

The GAP-module **Tool-Simulation** uses the **FEM method** to simulate the cutting performance of precision tools. In this context, 3D tool models from **ToolDesign** can be tested virtually in defined work pieces with their material properties before tool production begins.

The simulation process was realized with high computer processing power through extensive modification of a standard simulation software. At the start, an interactive work piece description for the process is provided to the user of **ToolSimulation**. This digital work piece receives information about all material properties that are necessary for the simulation process from an edited system data base. The geometry variations and material properties of the precision tools are available through the 3D volume models from **ToolDesign**.

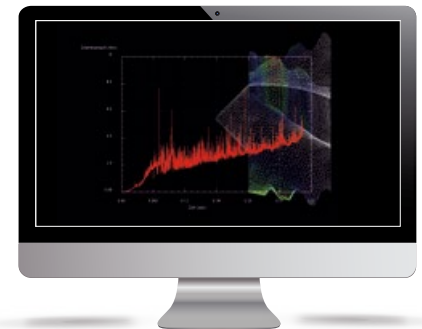


torque curve through FEM simulation



WEB-based quotation system

Digital value-added services
for the primary product



Solid state simulation FEM

Data Integration & Digital Transformation

Decentralised 3D printing of precision tools using the **Additive Manufacturing AM process** with internal cooling variants has already been successfully tested by **ToolProduction (TP)** at the customer's premises.

At **TP**, retrofit solutions ensure the continuity of the control of operating resources that are not 100% digital-capable.

Utilising the data structures of the TP steering system, **GAP** is developing a **WEB-based 8-platform strategy** for this application support.

These **8 platforms** enable the tool manufacturer to network with its markets and offer product users in all relevant disciplines **'digital transformation'** with value-added services that go beyond the primary product.

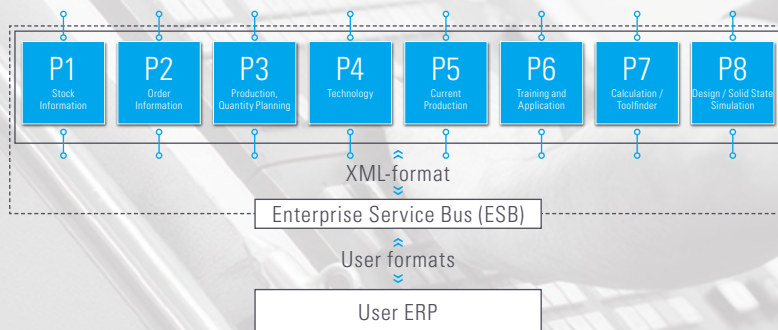


ToolProduction
by Schumacher



DigitalProcessPlanning
by Schumacher

Mirosoft Dynamics – Navision





ToolProduction
by Schumacher



DigitalProcessPlanning
by Schumacher



Production & Digital Process Control

The ToolProduction Principle

The Objective: Introduction of Digital Process Control according to 'Industry 4.0'

The required framework conditions for a successful introduction of digital and decentralized process control at SPT were provided through various modules of computer-aided information processing in all departments. By the early 1990s, SPT had completed connecting all departments related to production with a cross-departmental information system. This was part of the introduction of a CIM strategy (Computer Integrated Manufacturing).

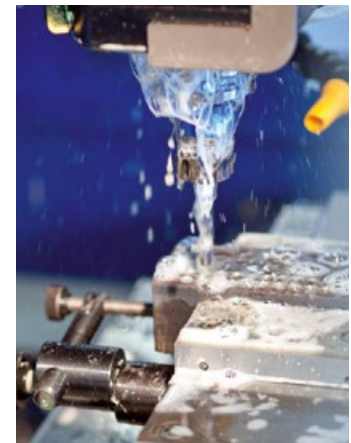
Smart services for customers through data generated during production



Robot-loaded grinding center



Examination of test results



Performance tests

Location-independent digital description of entire processing



As of Today, use of IT comprises the following technical-organizational sections:

- › stock management
- › sales
- › development and design
- › production scheduling
- › production planning and control
- › manufacturing
- › logistics and quality control
- › finance



Production & Digital Process Control

The current GAP-initiative **ToolProduction** with many features from 'Industry 4.0' considers the change in the industry's framework conditions and leads to the digital transformation of all processes. This is related to the introduction of **Smart Services**, a platform making any relevant process and technology data generated during production available in real-time.



ToolProduction
by Schumacher



DigitalProcessPlanning
by Schumacher

GAP

Gesellschaft für angewandte Prozesslenkung

Digital Process Planning for SMEs | The Modular Principle

Navigator



1.12 Product Overview

suitability code	■ well-suited	□ suited
core hole types	1 blind holes 3 blind and through holes	2 through holes 4 blind holes > 2 xd
coolant	O cutting oil P paraffin	E emulsion A air

Reference cutting speeds V_c page 8.5

Type of Thread & Catalogue 125 page	M
	MF
	G
	UNC/UN
	UNF
	NPT
	PG
	TR

Material Groups DIN ISO 513		Description	Beispiel	Lubricating Coolant	
P	P1	General construction steels (≤ 800N)	St37-2, 16 MnCr5, C60	E, O	
	P2	Cementation, Heat-treatable, Nitriding steels (≤ 1200N)	42CrMo4, 30CrNiMo8	E, O	
	P3	High-alloyed steels, Heat-resistant steels (≤ 1400N)	X38CrMoV5-3, Toolox44	O	
M	M1	Stainless steels austenitic	X 5 Cr Ni 18 10, X 6 Ni Mo Ti 17 12 2, X 10 Cr Ni S 18 9	O	
	M1	Stainless steels ferritic, martensitic	X 6 Cr 13, X 4 Cr Mo S 18, X 30 Cr 13, X 12 Cr Mo S 17	O	
	M2	Duplex steels	X2CrNiMoN22-5-3	O, P	
K	K1	Grey cast iron	EN-GJL-200 (GG 20), EN-GJL-300 (GG 30)	E, O	
	K2	Nodular cast iron	EN-GJS-400-15 (GGG 40), EN-GJS-600-3 (GGG 60)	E, O	
	K3	Malleable cast iron	EN-GJMB-450-06 (GTS 45), EN-GJMW-350-04 (GTW 35)	E, O	
N	N1	Aluminium wrought alloys	Al Mg Si, Al Mn 1	E, O	
	N1	Aluminium cast alloys < 10 % Si (< 10 % Si)	G-Al Mg 3, G-Al Si 9 Cu 3	E, O	
	N2	Aluminium cast alloys ≥ 10% Si (≥ 10 % Si)	G-Al Si 10 Mg, G-AISI 12	E, O	
	N3	Copper alloys	E-Cu, SE-Cu	E, O	
	N3	Special copper alloys (AMPCO)	Ampco 18, Ampco 20, Ampco 25	dry	
	N4	Brass long chipping	Cu Zn 30	E, O	
	N4	Brass short chipping	Cu Zn 39 Pb 2 (MS 58), Cu Zn 40 Al 2	E, O	
	N5	Bronze long chipping	G Cu Sn 10 Zn (Rg 10)	E, O	
	N5	Bronze short chipping	G Cu Pb 5 Sn (RG 5), Cu Sn 8 (Rg 7)	E, O	
	N6	Thermoplastics	Hostalen/Makrolon/PS/PVC	E, O	
	N7	Duroplastics/Fibre reinforced	Bakelit/Pertinax/Ferrozell/Resopal	E, O	
	N8	Magnesium alloys	Az 91	O, A	
S	N9	Graphite	C 8000	A	
	S1	Pure titanium/titanium alloys	Ti 99, 5, Ti 99.4, Ti Al 5 Sn 2, Ti Al 6 V 4	E, O, P	
	S2	Pure nickel/nickel alloys	Ni 99,6, Inconel 718	O, P	
H	H1	Hard materials up to 50 HRC	Hardox 450	O, P	
	H2	Hard materials up to 60 HRC	Hardox 550	O, P	

Core hole types

2.2	2.5	2.6	2.6	2.6	2.8	2.10	2.12	2.13	2.13	2.15	2.15	2.15	2.18	2.18	
3.1		3.5								3.6				3.6	
4.1		4.2								4.3				4.3	
5.1		5.3								5.5				5.5	
5.22		5.24								5.26				5.26	
6.4															



ST HSS-E	MS HSS-E	GG HSS-E	GG HSS-E	GG HSS-E	HARD HSS-E/PM	HARD HSS-E/PM	MG HSS-E/PM	AL HSS-E/PM	AL HSS-E/PM	ST HSS-E	ST 6G HSS-E	ST 7G HSS-E	ST LH HSS-E	ST HSS-E	
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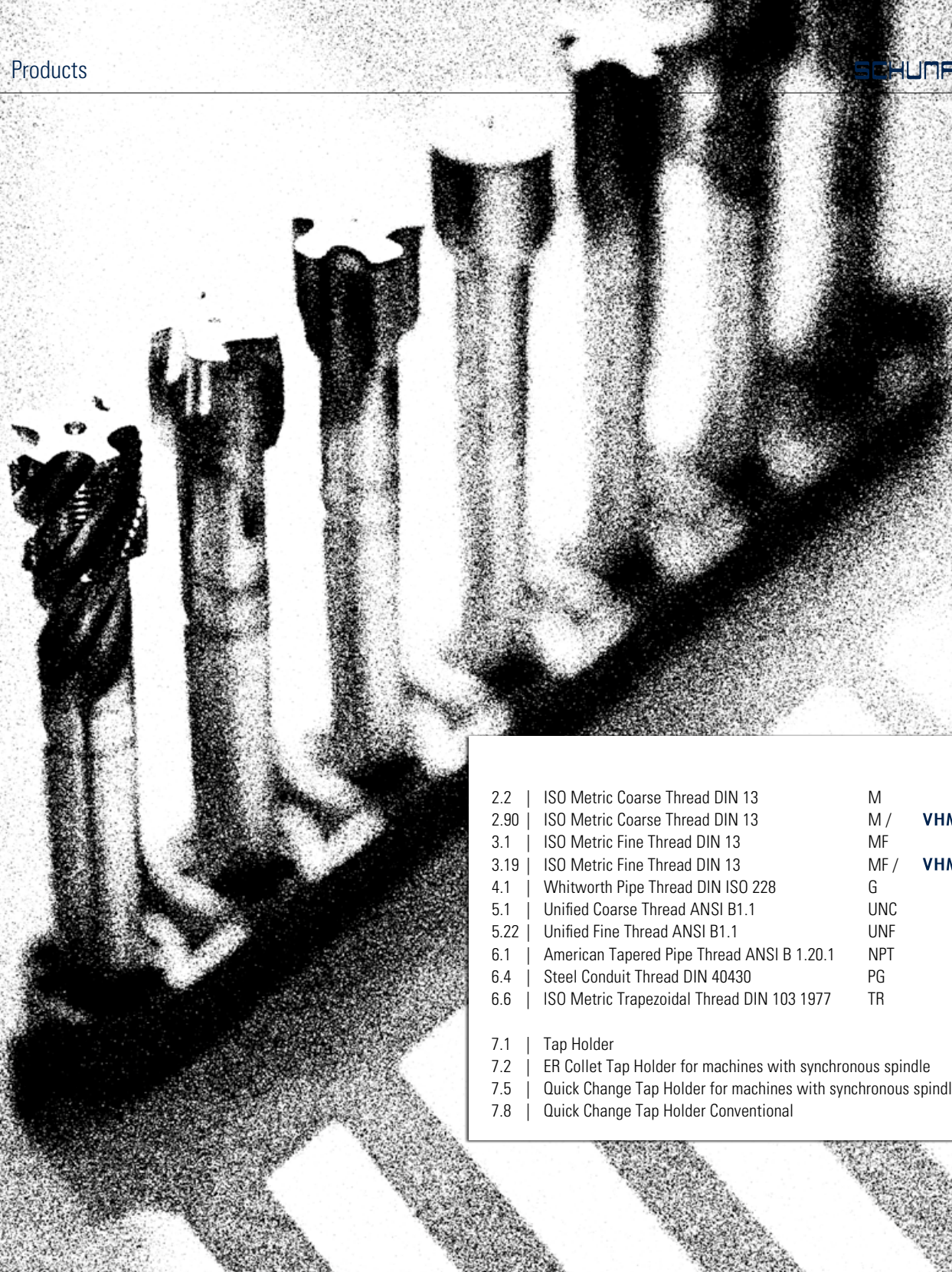
2.57	2.59	2.59	2.62	2.64	2.66	2.66	2.68	2.70	2.70	2.72	2.72	2.74	2.76	2.76	Thread former
	3.14				3.15	3.15									
	4.8				4.9	4.9									
	5.18				5.16	5.16									
	5.38				5.35	5.35									

															
ST, CNC HSS-E/PM	Uni HSS-E	Uni HSS-E	Uni HSS/PM	VG HSS-E/PM	VA HSS-E	VA HSS-E	VA HSS-E/PM	AL HSS-E/PM	AL HSS-E/PM	VG HSS-E	VG HSS-E	Uni HSS-E/PM	AL HSS-E/PM	AL HSS-E/PM	
■	■	■	■	■		■	■			□	□	■			
■	■	■	■	■	■	■	■			■	■	■			
□										■	■				
■	■	■	■	■	■	■	■					■			
■	■	■	■	■	■	■	■					■			
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■	■	■	■												
□	■	■	■					■	■			■	■	■	
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	■	■						■	■						
	■	■						■	■			■	■	■	
□	■	■						■	■						
						□	□	□							
4	1	1	1	4	1	1	4	4	4	1	1	3	3	3	

2.78	2.80	2.82	2.82	2.82						2.90	2.91	2.91	2.92	2.93	2.93	
												3.19				
		5.20	5.20							VHMtec CARBIDE by Schumacher						
Thread former					6.1	6.2										
								6.6	6.6							

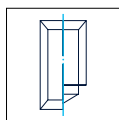


ST, CNC HSS-E/PM	VG HSS-E/PM	ST HSS-E	ST HSS-E	ST 6GX HSS-E	ST HSS-E	VG HSS-E/PM	ST HSS-E	ST LH HSS-E	Hard VHM	Hard VHM	Hard VHM	Uni VHM	ST VHM	ST VHM	
■	■	■	■	■	■	□	■	■				■	■	■	
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	□								■	■	■				
3	3	3	3	3	3	1	2	2	2	3	3	1	3	3	



2.2	ISO Metric Coarse Thread DIN 13	M	
2.90	ISO Metric Coarse Thread DIN 13	M /	VHM
3.1	ISO Metric Fine Thread DIN 13	MF	
3.19	ISO Metric Fine Thread DIN 13	MF /	VHM
4.1	Whitworth Pipe Thread DIN ISO 228	G	
5.1	Unified Coarse Thread ANSI B1.1	UNC	
5.22	Unified Fine Thread ANSI B1.1	UNF	
6.1	American Tapered Pipe Thread ANSI B 1.20.1	NPT	
6.4	Steel Conduit Thread DIN 40430	PG	
6.6	ISO Metric Trapezoidal Thread DIN 103 1977	TR	
7.1	Tap Holder		
7.2	ER Collet Tap Holder for machines with synchronous spindle		
7.5	Quick Change Tap Holder for machines with synchronous spindle		
7.8	Quick Change Tap Holder Conventional		

Cutting Data



Ø d ₁	P _{mm}	L ₁	L ₂	d ₂										
M 6	1	80	17	4.5	3.4	5.0								
M 7	1	80	17	5.5	4.3	6.0								
M 8	1.25	90	20	6	4.9	6.8								
M 9	1.25	90	20	7	5.5	7.8								
M 10	1.5	100	22	7	5.5	8.5								
M 12	1.75	110	24	9	7	10.2								
M 14	2	110	26	11	9	12.0								
M 16	2	110	27	12	9	14.0								
M 18	2.5	125	30	14	11	15.5								
M 20	2.5	140	32	16	12	17.5								
M 22	2.5	140	32	18	14.5	19.5								
M 24	3	160	34	18	14.5	21.0								
M 27	3	160	36	20	16	24.0								
M 30	3.5	180	40	22	18	26.5								
M 33	3.5	180	40	25	20	29.5								
M 36	4	200	50	28	22	32.0								

■ available – intermediate size on request

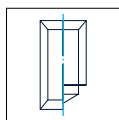
Machine Taps White Ring

DIN 376 HSS-E

straight flutes
for cast iron

Group 4030
for blind and through holes

CAST
IRON

 $2x d_1$ 

High Speed Cutting
by Schumacher

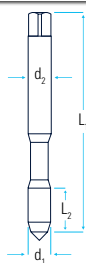


High Speed Cutting
by Schumacher

Cutting Data



Art.-No.

Technology  Page 8.1Champfer Length Page 8.4Surface Page 8.2Tolerance Page 8.5Cutting Data  Page 8.6

40300/01	40300/25	40300/2540
High Volume 	High Volume 	Internal coolant
White Ring	White Ring	White Ring
	C / 2-3 x P	
nitrided	TiN	TiN
6HX	6HX	6HX
K1 grey cast iron N7 duroplastics		

Ø d ₁	P _{mm}	L ₁	L ₂	d ₂	□	▩						
M 6	1	80	17	4.5	3.4	5.0						
M 7	1	80	17	5.5	4.3	6.0						
M 8	1.25	90	20	6	4.9	6.8						
M 9	1.25	90	20	7	5.5	7.8						
M 10	1.5	100	22	7	5.5	8.5						
M 12	1.75	110	24	9	7	10.2	■		■		■	
M 14	2	110	26	11	9	12.0	■					
M 16	2	110	27	12	9	14.0	■		■		■	
M 18	2.5	125	30	14	11	15.5	■					
M 20	2.5	140	32	16	12	17.5	■		■		■	
M 22	2.5	140	32	18	14.5	19.5	■					
M 24	3	160	34	18	14.5	21.0	■					
M 27	3	160	36	20	16	24.0	■					
M 30	3.5	180	40	22	18	26.5	■					
M 33	3.5	180	40	25	20	29.5						
M 36	4	200	50	28	22	32.0						

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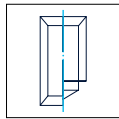
Cutting Data



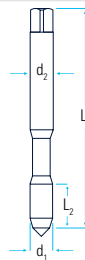
DIN 371 HSS-E PM

straight flutes
for hard materials

Group 3080
for blind and through holes

 $2x d_1$ 

Art.-No.

Technology Page 8.1Champfer Length Page 8.4Surface Page 8.2Tolerance  Page 8.5Cutting Data Page 8.6

30800/54

PM-Line

Hard Steel 

A / 6-8 x P

TiAlN

IS02 (6H)

H1 hard materials

[illegible]

■ available – intermediate size on request

Machine Taps

DIN 371 HSS-E PM

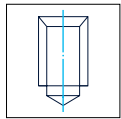
straight flutes

for magnesium alloys

Group 3090

for blind holes

MG

 $2x d_1$ 

Cutting Data

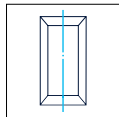
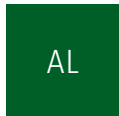
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Machine Taps - MISTRAL

DIN 371 HSS-E PM

Spiral point for aluminium and bronze alloys

Group 3100
for through holes

 $2x d_1$ 

High Speed Cutting
by Schumacher



High Speed Cutting

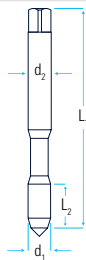


DLC

Diamond like Carbon

Innovative surface coating technologies with high hardness and low frictional coefficient

Art-No.		
Technology		Page 8.1
Chamfer Length		Page 8.4
Surface		Page 8.2
Tolerance		Page 8.5
Cutting Data		Page 8.6



31000/02	31000/24
PM-Line 🌐	PM-Line 🌐
B / 3,5-5 x P	
CrN	DLC
ISO2 (6H)	ISO2 (6H)
N1 aluminium alloys	N6 thermoplastics

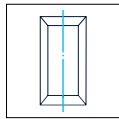
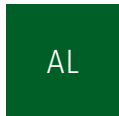
[illegible]

Machine Taps - MISTRAL

DIN 376 HSS-E PM

Spiral point for aluminium and bronze alloys

Group 4100
for through holes

 $2x d_1$ 

High Speed Cutting
by Schumacher



High Speed Cutting
by Schumacher

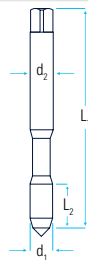


DLC

Diamond like Carbon

Innovative surface coating technologies with high hardness and low frictional coefficient

Art.-No.		
Technology		Page 8.1
Chamfer Length		Page 8.4
Surface		Page 8.2
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41000/02	41000/24
PM-Line	PM-Line
B / 3,5-5 x P	
CrN	DLC
ISO2 (6H)	ISO2 (6H)
N1 aluminium alloys	N6 thermoplastics

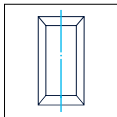
Ø d ₁	P _{mm}	L ₁	L ₂	d ₂	□	▩											
M 6	1	80	17	4.5	3.4	5.0											
M 7	1	80	17	5.5	4.3	6.0											
M 8	1.25	90	20	6	4.9	6.8											
M 9	1.25	90	20	7	5.5	7.8											
M 10	1.5	100	22	7	5.5	8.5											
M 12	1.75	110	24	9	7	10.2	■	■									
M 14	2	110	26	11	9	12.0											
M 16	2	110	27	12	9	14.0	■	■									
M 18	2.5	125	30	14	11	15.5											
M 20	2.5	140	32	16	12	17.5											
M 22	2.5	140	32	18	14.5	19.5											
M 24	3	160	34	18	14.5	21.0											
M 27	3	160	36	20	16	24.0											
M 30	3.5	180	40	22	18	26.5											
M 33	3.5	180	40	25	20	29.5											
M 36	4	200	50	28	22	32.0											

Machine Taps

DIN 371 HSS-E

Spiral point
for general construction steel

Group 3110
for through holes



2xd₁

Cutting Data



Art.-No.

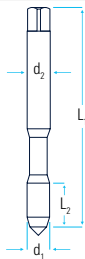
Technology Page 8.1

Chamfer Length Page 8.4

Surface Page 8.2

Tolerance Page 8.5

Cutting Data Page 8.6



31100
High Volume

31100 B

31100 E

B / 3,5-5 x P

bright

bright

bright

ISO2 (6H)

ISO3 (6G)

7G

P1 general construction steel K2+K3 spheroidal and malleable cast iron

Ø d ₁	P _{mm}	L ₁	L ₂	d ₂		
M 3	0.5	56	11	3.5	2.7	2.5
M 3.5	0.6	56	12	4	3	2.9
M 4	0.7	63	13	4.5	3.4	3.3
M 5	0.8	70	15	6	4.9	4.2
M 6	1	80	17	6	4.9	5.0
M 7	1	80	17	7	5.5	6.0
M 8	1.25	90	20	8	6.2	6.8
M 9	1.25	90	20	9	7	7.8
M 10	1.5	100	22	10	8	8.5
M 12	1.75	110	24	12	9	10.2

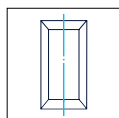
Machine Taps

DIN 371 HSS-E

Spiral point
for general construction steel

Group 3110
for through holes

STEEL

 $2x d_1$ 

High Speed Cutting
für Schmalmer

Cutting Data



Art.-No.

Technology  Page 8.1Champfer Length Page 8.4Surface  Page 8.2Tolerance Page 8.5Cutting Data  Page 8.6

31105	31100/25	31100/42
	High Volume 	
LH		2 x L1
	B / 3,5-5 x P	
bright	TiN	bright
ISO2 (6H)	ISO2 (6H)	ISO2 (6H)
P1 general construction steel	K2+K3 spheroidal and malleable cast iron	

Ø d ₁	P _{mm}	L ₁	L ₂	d ₂								
M 1.7	0.35	40	8	2.5	2.1	1.35						
M 1.8	0.35	40	8	2.5	2.1	1.45						
M 2	0.4	45	8	2.8	2.1	1.6						
M 2.2	0.45	45	8	2.8	2.1	1.75						
M 2.3	0.4	45	8	2.8	2.1	1.9						
M 2.5	0.45	50	9	2.8	2.1	2.05						
M 2.6	0.45	50	9	2.8	2.1	2.15						
M 3	0.5	56	11	3.5	2.7	2.5		■		■		■
M 3.5	0.6	56	12	4	3	2.9						
M 4	0.7	63	13	4.5	3.4	3.3		■		■		■
M 5	0.8	70	15	6	4.9	4.2		■		■		■
M 6	1	80	17	6	4.9	5.0		■		■		■
M 7	1	80	17	7	5.5	6.0						
M 8	1.25	90	20	8	6.2	6.8		■		■		■
M 9	1.25	90	20	9	7	7.8						
M 10	1.5	100	22	10	8	8.5		■		■		■

■ available – intermediate size on request

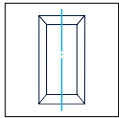
Machine Taps

DIN 376 HSS-E

Spiral point
for general construction steel

Group 4110
for through holes

STEEL

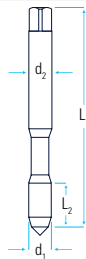
 $2x d_1$ 

High Speed Cutting
by Schumacher

Cutting Data



Art.-No.

Technology Page 8.1Champfer Length Page 8.4Surface Page 8.2Tolerance  Page 8.5Cutting Data Page 8.6

41100/25	41100/42
High Volume 	
	2 x L1
B / 3,5-5 x P	
TiN	bright
ISO2 (6H)	ISO2 (6H)
P1 general construction steel	K2+K3 spheroidal and malleable cast iron

[illegible]

■ available – intermediate size on request

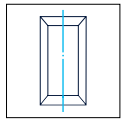
Machine Taps - NUMERIC

DIN 371 HSS-E PM

Spiral point
for steel

Group 3113
for through holes

STEEL

 $2x d_1$ 

High Speed Cutting
by Schumacher

Cutting Data

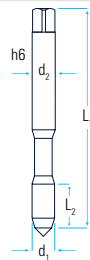


NUMERIC

Supporting Digital Production

For use on CNC machines
with synchronized machining

Art.-No.

Technology  Page 8.1Champfer Length Page 8.4Surface Page 8.2Tolerance  Page 8.5Cutting Data Page 8.6

31130/48

PM-Line

B / 3,5-5 x P

TiCN

6HX

P1 general construction steel P2 high strength steel M1 chemical resistant steel

[illegible]

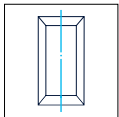
Machine Taps - NUMERIC

DIN 376 HSS-E PM

Spiral point
for steel

Group 4113
for through holes

STEEL

 $2x d_1$ 

High Speed Cutting
by Schumacher

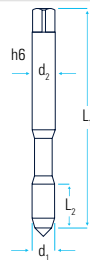
Cutting Data



NUMERIC
Supporting Digital Production

For use on CNC machines
with synchronized machining

Art.-No.

Technology Page 8.1Champfer Length Page 8.4Surface Page 8.2Tolerance  Page 8.5Cutting Data Page 8.6

41130/48

PM-Line 

B / 3,5-5 x P

TiCN

6HX

P1 general construction steel P2 high strength steel M1 chemical resistant steel

Ø d ₁	P _{mm}	L ₁	L ₂	d ₂		
M 6	1	80	10	4.5	3.4	5.0
M 7	1	80	10	5.5	4.3	6.0
M 8	1.25	90	14	6	4.9	6.8
M 9	1.25	90	14	7	5.5	7.8
M 10	1.5	100	16	7	5.5	8.5
M 12	1.75	110	18	9	7	10.2
M 14	2	110	20	11	9	12.0
M 16	2	110	20	12	9	14.0
M 18	2.5	125	25	14	11	15.5
M 20	2.5	140	25	16	12	17.5
M 22	2.5	140	25	18	14.5	19.5
M 24	3	160	30	18	14.5	21.0
M 27	3	160	30	20	16	24.0
M 30	3.5	180	35	22	18	26.5
M 33	3.5	180	35	25	20	29.5
M 36	4	200	40	28	22	32.0

■ available – intermediate size on request

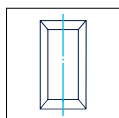
Machine Taps Blue Ring

DIN 371 HSS-E

Spiral point
for chemical resistant steel

Group 3120
for through holes

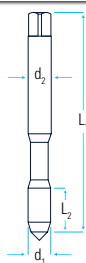
INOX
Stainless

 $2x d_1$ 

Cutting Data



Art.-No.

Technology  Page 8.1Champfer Length  Page 8.4Surface i Page 8.2Tolerance Page 8.5Cutting Data  Page 8.6

31200/26	31200/25
High Volume 	High Volume 
Blue Ring	Blue Ring
B / 3,5-5 x P	
VAP	TiN
ISO2 (6H)	ISO2 (6H)
P2 high strength steel	M1 chemical resistant steel

[illegible]

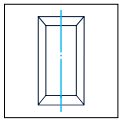
Machine Taps Blue Ring - POLAR

DIN 376 HSS-E PM

Spiral point
for chemical resistant steel

Group 4121
for through holes

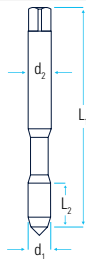
INOX
Stainless

 $2x d_1$ 

Cutting Data



Art.-No.

Technology Page 8.1Champfer Length Page 8.4Surface Page 8.2Tolerance  Page 8.5Cutting Data Page 8.6

41210/48

PM-Line 

Blue Ring

B / 3,5-5 x P

TiCN

6HX

P2 high strength steel M1+M2 chemical resistant steel

Ø d ₁	P _{mm}	L ₁	L ₂	d ₂		
M 6	1	80	17	4.5	3.4	5.0
M 7	1	80	17	5.5	4.3	6.0
M 8	1.25	90	20	6	4.9	6.8
M 9	1.25	90	20	7	5.5	7.8
M 10	1.5	100	22	7	5.5	8.5
M 12	1.75	110	24	9	7	10.2
M 14	2	110	26	11	9	12.0
M 16	2	110	27	12	9	14.0
M 18	2.5	125	30	14	11	15.5
M 20	2.5	140	32	16	12	17.5
M 22	2.5	140	32	18	14.5	19.5
M 24	3	160	34	18	14.5	21.0
M 27	3	160	36	20	16	24.0
M 30	3.5	180	40	22	18	26.5
M 33	3.5	180	40	25	20	29.5
M 36	4	200	50	28	22	32.0

■ available – intermediate size on request

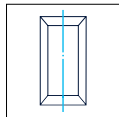
Machine Taps Red Ring - TYPHOON B

DIN 371 HSS-E PM

Spiral point
for high strength steel

Group 3130
for through holes

HIGH
STRENGTH

 $2x d_1$ 

Cutting Data



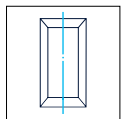
Art.-No.							31300/48
Technology		Page 8.1					PM-Line 
Chamfer Length		Page 8.4					Red Ring
Surface		Page 8.2					B / 3,5-5 x P
Tolerance		Page 8.5					TiCN
Cutting Data		Page 8.6					ISO2 (6H)
							P2 high strength steel M1 chemical resistant steel
$\emptyset d_1$	P_{mm}	L_1	L_2	d_2			
M 1.7	0.35	40	8	2.5	2.1	1.35	
M 1.8	0.35	40	8	2.5	2.1	1.45	
M 2	0.4	45	8	2.8	2.1	1.6	
M 2.2	0.45	45	8	2.8	2.1	1.75	
M 2.3	0.4	45	8	2.8	2.1	1.9	
M 2.5	0.45	50	9	2.8	2.1	2.05	
M 2.6	0.45	50	9	2.8	2.1	2.15	
M 3	0.5	56	11	3.5	2.7	2.5	
M 3.5	0.6	56	12	4	3	2.9	
M 4	0.7	63	13	4.5	3.4	3.3	
M 5	0.8	70	15	6	4.9	4.2	
M 6	1	80	17	6	4.9	5.0	
M 7	1	80	17	7	5.5	6.0	
M 8	1.25	90	20	8	6.2	6.8	
M 9	1.25	90	20	9	7	7.8	
M 10	1.5	100	22	10	8	8.5	

Machine Taps Red Ring

DIN 371 HSS-E PM

Spiral point for nickel alloys

Group 3140
for through holes

 $2x d_1$ 

Cutting Data



Art.-No.							31400
Technology		Page 8.1					PM-Line 
Chamfer Length		Page 8.4					Red Ring
Surface		Page 8.2					B / 3,5-5 x P
Tolerance		Page 8.5					bright
Cutting Data		Page 8.6					ISO2 (6H)
							P2 high strength steel S1 titanium alloys S2 nickel alloys
$\emptyset d_1$	P_{mm}	L_1	L_2	d_2			
M 1.7	0.35	40	8	2.5	2.1	1.35	
M 1.8	0.35	40	8	2.5	2.1	1.45	
M 2	0.4	45	8	2.8	2.1	1.6	
M 2.2	0.45	45	8	2.8	2.1	1.75	
M 2.3	0.4	45	8	2.8	2.1	1.9	
M 2.5	0.45	50	9	2.8	2.1	2.05	
M 2.6	0.45	50	9	2.8	2.1	2.15	
M 3	0.5	56	11	3.5	2.7	2.5	
M 3.5	0.6	56	12	4	3	2.9	
M 4	0.7	63	13	4.5	3.4	3.3	
M 5	0.8	70	15	6	4.9	4.2	
M 6	1	80	17	6	4.9	5.0	
M 7	1	80	17	7	5.5	6.0	
M 8	1.25	90	20	8	6.2	6.8	
M 9	1.25	90	20	9	7	7.8	
M 10	1.5	100	22	10	8	8.5	

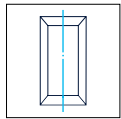
Machine Taps

DIN 376 HSS-E

Spiral point and interrupted thread
for general construction steel

Group 4160
for through holes

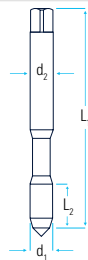
STEEL

 $2x d_1$ 

Cutting Data



Art.-No.

Technology Page 8.1Champfer Length Page 8.4Surface Page 8.2Tolerance  Page 8.5Cutting Data Page 8.6

41600

High Volume

AZ

B / 3,5-5 x P

bright

IS02 (6H)

P1 general construction steel

[illegible]

■ available – intermediate size on request

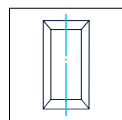
Cutting Data



DIN 371 HSS-E

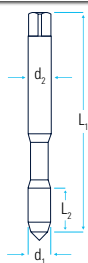
Spiral point
for high strength steel

Group 3170
for through holes

 $2x d_1$ 

Art.-No.

Technology		Page 8.1
Chamfer Length		Page 8.4
Surface		Page 8.2
Tolerance		Page 8.5
Cutting Data		Page 8.6



31700	31700/48
High Volume 	High Volume 
Red Ring	Red Ring
B / 3,5-5 x P	
bright	TiCN
ISO2 (6H)	ISO2 (6H)
P2 high strength steel	

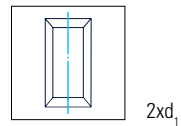
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Machine Taps Red Ring

DIN 376 HSS-E

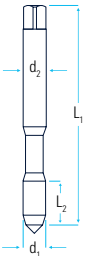
Spiral point
for high strength steel

Group 4170
for through holes



Cutting Data



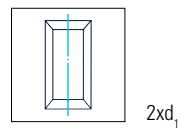
Art.-No.							41700		41700/48		
Technology		Page 8.1					High Volume 		High Volume 		
Chamfer Length		Page 8.4					Red Ring		Red Ring		
Surface		Page 8.2					B / 3,5-5 x P				
Tolerance		Page 8.5					bright		TiCN		
Cutting Data		Page 8.6					ISO2 (6H)		ISO2 (6H)		
							P2 high strength steel				
											
Ø d ₁	P _{mm}	L ₁	L ₂	d ₂							
M 6	1	80	17	4.5	3.4	5.0					
M 7	1	80	17	5.5	4.3	6.0					
M 8	1.25	90	20	6	4.9	6.8					
M 9	1.25	90	20	7	5.5	7.8					
M 10	1.5	100	22	7	5.5	8.5					
M 12	1.75	110	24	9	7	10.2					
M 14	2	110	26	11	9	12.0					
M 16	2	110	27	12	9	14.0					
M 18	2.5	125	30	14	11	15.5					
M 20	2.5	140	32	16	12	17.5					
M 22	2.5	140	32	18	14.5	19.5					
M 24	3	160	34	18	14.5	21.0					
M 27	3	160	36	20	16	24.0					
M 30	3.5	180	40	22	18	26.5					
M 33	3.5	180	40	25	20	29.5					
M 36	4	200	50	28	22	32.0					

Machine Taps Black Ring

DIN 371 HSS-E

Spiral point
for universal use

Group 3190
for through holes



Cutting Data

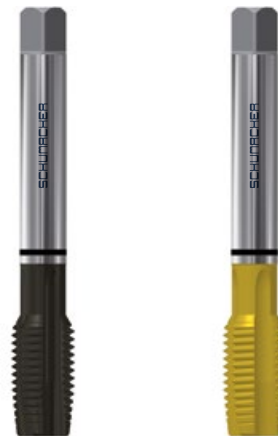
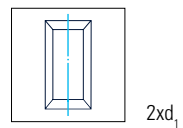
[illegible]

Machine Taps Black Ring

DIN 376 HSS-E

Spiral point
for universal use

Group 4190
for through holes



Cutting Data



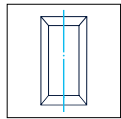
Art.-No.							41900/26		41900/25	
Technology		Page 8.1						High Volume 	High Volume 	
Chamfer Length		Page 8.4						Black Ring	Black Ring	
Surface		Page 8.2						B / 3,5-5 x P	B / 3,5-5 x P	
Tolerance		Page 8.5						VAP	TiN	
Cutting Data		Page 8.6						ISO2 (6H)	ISO2 (6H)	
								P1 general construction steel	M1 chemical resistant steel	N1 aluminium alloys N3 copper alloys
Ø d ₁	P _{mm}	L ₁	L ₂	d ₂						
M 6	1	80	17	4.5	3.4	5.0				
M 7	1	80	17	5.5	4.3	6.0				
M 8	1.25	90	20	6	4.9	6.8				
M 9	1.25	90	20	7	5.5	7.8				
M 10	1.5	100	22	7	5.5	8.5				
M 12	1.75	110	24	9	7	10.2				
M 14	2	110	26	11	9	12.0				
M 16	2	110	27	12	9	14.0				
M 18	2.5	125	30	14	11	15.5				
M 20	2.5	140	32	16	12	17.5				
M 22	2.5	140	32	18	14.5	19.5				
M 24	3	160	34	18	14.5	21.0				
M 27	3	160	36	20	16	24.0				
M 30	3.5	180	40	22	18	26.5				
M 33	3.5	180	40	25	20	29.5				
M 36	4	200	50	28	22	32.0				

Machine Taps Black Ring

DIN 376 HSS-E-PM

Spiral point
for universal use

Group 4190
for through holes

 $2x d_1$ 

Cutting Data

[illegible]

Cutting Data



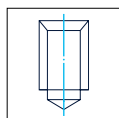
DIN 371 HSS-E

RH spiral flutes 15°

for general construction steel

Group 3200
for blind holes

STEEL

 $2x d_1$ 

Art.-No.

Technology  Page 8.1Champfer Length Page 8.4Surface Page 8.2Tolerance Page 8.5Cutting Data  Page 8.6

32000	32000/40	32000/2540
High Volume 		
	Internal coolant	Internal coolant
	C / 2-3 x P	
bright	bright	TiN
ISO2 (6H)	ISO2 (6H)	ISO2 (6H)
P1 general construction steel	K2+K3 spheroidal and malleable cast iron	

Ø d ₁	P _{mm}	L ₁	L ₂	d ₂							
M 1.7	0.35	40	8	2.5	2.1	1.35					
M 1.8	0.35	40	8	2.5	2.1	1.45					
M 2	0.4	45	8	2.8	2.1	1.6					
M 2.2	0.45	45	8	2.8	2.1	1.75					
M 2.3	0.4	45	8	2.8	2.1	1.9					
M 2.5	0.45	50	9	2.8	2.1	2.05					
M 2.6	0.45	50	9	2.8	2.1	2.15					
M 3	0.5	56	6	3.5	2.7	2.5	■				
M 3.5	0.6	56	7	4	3	2.9					
M 4	0.7	63	7	4.5	3.4	3.3	■				
M 5	0.8	70	8	6	4.9	4.2	■				
M 6	1	80	10	6	4.9	5.0	■		■	■	
M 7	1	80	10	7	5.5	6.0					
M 8	1.25	90	13	8	6.2	6.8	■		■	■	
M 9	1.25	90	13	9	7	7.8					
M 10	1.5	100	15	10	8	8.5	■		■	■	

■ available – intermediate size on request

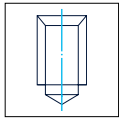
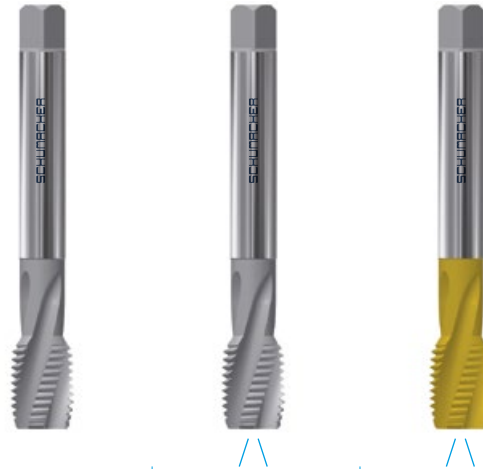
Machine Taps

DIN 376 HSS-E

RH spiral flutes 15°
for general construction steel

Group 4200
for blind holes

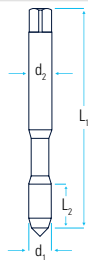
STEEL

 $2x d_1$ 

Cutting Data



Art.-No.		
Technology		Page 8.1
Chamfer Length		Page 8.4
Surface		Page 8.2
Tolerance		Page 8.5
Cutting Data		Page 8.6



42000	42000/40	42000/2540
High Volume 	Internal coolant	Internal coolant
	C / 2-3 x P	
bright	bright	TiN
ISO2 (6H)	ISO2 (6H)	ISO2 (6H)
P1 general construction steel	K2+K3 spheroidal and malleable cast iron	

Ø d ₁	P _{mm}	L ₁	L ₂	d ₂	□	▩						
M 6	1	80	10	4.5	3.4	5.0						
M 7	1	80	10	5.5	4.3	6.0						
M 8	1.25	90	14	6	4.9	6.8						
M 9	1.25	90	14	7	5.5	7.8						
M 10	1.5	100	16	7	5.5	8.5						
M 12	1.75	110	18	9	7	10.2	■		■		■	
M 14	2	110	20	11	9	12.0	■		■		■	
M 16	2	110	20	12	9	14.0	■		■		■	
M 18	2.5	125	25	14	11	15.5						
M 20	2.5	140	25	16	12	17.5	■		■		■	
M 22	2.5	140	25	18	14.5	19.5						
M 24	3	160	30	18	14.5	21.0	■					
M 27	3	160	30	20	16	24.0						
M 30	3.5	180	35	22	18	26.5	■					
M 33	3.5	180	35	25	20	29.5						
M 36	4	200	40	28	22	32.0	■					

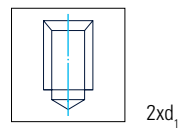
■ available – intermediate size on request

Machine Taps Red Ring

DIN 371 HSS-E

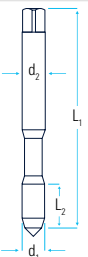
RH spiral flutes 20°
for high strength steel

Group 3240
for blind holes



Cutting Data



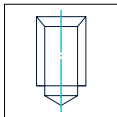
Art.-No.							32400		32400/48	
Technology  Page 8.1							Red Ring		Red Ring	
Chamfer Length  Page 8.4							3-4 x P			
Surface  Page 8.2							bright		TiCN	
Tolerance  Page 8.5							ISO2 (6H)		ISO2 (6H)	
Cutting Data  Page 8.6		P2 high strength steel								
Ø d ₁	P _{mm}	L ₁	L ₂	d ₂						
M 1.7	0.35	40	8	2.5	2.1	1.35				
M 1.8	0.35	40	8	2.5	2.1	1.45				
M 2	0.4	45	8	2.8	2.1	1.6				
M 2.2	0.45	45	8	2.8	2.1	1.75				
M 2.3	0.4	45	8	2.8	2.1	1.9				
M 2.5	0.45	50	9	2.8	2.1	2.05				
M 2.6	0.45	50	9	2.8	2.1	2.15				
M 3	0.5	56	6	3.5	2.7	2.5				
M 3.5	0.6	56	7	4	3	2.9				
M 4	0.7	63	7	4.5	3.4	3.3				
M 5	0.8	70	8	6	4.9	4.2				
M 6	1	80	10	6	4.9	5.0				
M 7	1	80	10	7	5.5	6.0				
M 8	1.25	90	13	8	6.2	6.8				
M 9	1.25	90	13	9	7	7.8				
M 10	1.5	100	15	10	8	8.5				

Machine Taps Red Ring

DIN 376 HSS-E

RH spiral flutes 20°
for high strength steel

Group 4240
for blind holes



2xd₁

Cutting Data



Art.-No.

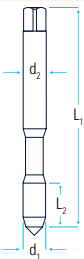
Technology Page 8.1

Chamfer Length Page 8.4

Surface Page 8.2

Tolerance Page 8.5

Cutting Data Page 8.6



42400

42400/48

Red Ring

Red Ring

3-4 x P

bright

TiCN

ISO2 (6H)

ISO2 (6H)

P2 high strength steel

Ø d₁

P_{mm}

L₁

L₂

d₂

□

▨

M 6

1

80

10

4.5

3.4

5.0

M 7

1

80

10

5.5

4.3

6.0

M 8

1.25

90

14

6

4.9

6.8

M 9

1.25

90

14

7

5.5

7.8

M 10

1.5

100

16

7

5.5

8.5

M 12

1.75

110

18

9

7

10.2

■

■

M 14

2

110

20

11

9

12.0

■

■

M 16

2

110

20

12

9

14.0

■

■

M 18

2.5

125

25

14

11

15.5

M 20

2.5

140

25

16

12

17.5

■

■

M 22

2.5

140

25

18

14.5

19.5

M 24

3

160

30

18

14.5

21.0

■

■

M 27

3

160

30

20

16

24.0

M 30

3.5

180

35

22

18

26.5

■

■

M 33

3.5

180

35

25

20

29.5

M 36

4

200

40

28

22

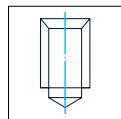
32.0

Machine Taps Red Ring

DIN 371 HSS-E PM

RH spiral flutes 20°
for nickel alloys

Group 3260
for blind holes

 $2x d_1$ 

Cutting Data



Art.-No.							32600
Technology		Page 8.1					PM-Line 
Chamfer Length		Page 8.4					Red Ring
Surface		Page 8.2					3-4 x P
Tolerance		Page 8.5					bright
Cutting Data		Page 8.6					ISO2 (6H)
P2 high strength steel S1 titanium alloys S2 nickel alloys							

Technical drawing of a red ring. The drawing shows a side view of the ring with dimensions labeled: d_1 is the outer diameter, d_2 is the inner diameter, L_1 is the total length, and L_2 is the length of the chamfered section.

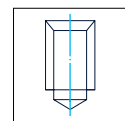
$\varnothing d_1$	P_{mm}	L_1	L_2	d_2			
M 1.7	0.35	40	8	2.5	2.1	1.35	
M 1.8	0.35	40	8	2.5	2.1	1.45	
M 2	0.4	45	8	2.8	2.1	1.6	
M 2.2	0.45	45	8	2.8	2.1	1.75	
M 2.3	0.4	45	8	2.8	2.1	1.9	
M 2.5	0.45	50	9	2.8	2.1	2.05	
M 2.6	0.45	50	9	2.8	2.1	2.15	
M 3	0.5	56	11	3.5	2.7	2.5	
M 3.5	0.6	56	12	4	3	2.9	
M 4	0.7	63	13	4.5	3.4	3.3	
M 5	0.8	70	15	6	4.9	4.2	
M 6	1	80	17	6	4.9	5.0	
M 7	1	80	17	7	5.5	6.0	
M 8	1.25	90	20	8	6.2	6.8	
M 9	1.25	90	20	9	7	7.8	
M 10	1.5	100	22	10	8	8.5	

Machine Taps Red Ring

DIN 376 HSS-E PM

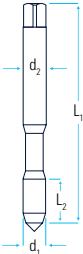
RH spiral flutes 20°
for nickel alloys

Group 4260
for blind holes

 $2x d_1$ 

Cutting Data



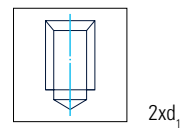
Art-No.							42600
Technology		Page 8.1					PM-Line 
Chamfer Length		Page 8.4					Red Ring
Surface		Page 8.2					3-4 x P
Tolerance		Page 8.5					bright
Cutting Data		Page 8.6					ISO2 (6H)
							P2 high strength steel S1 titanium alloys S2 nickel alloys
							
Ø d ₁	P _{mm}	L ₁	L ₂	d ₂			
M 6	1	80	17	4.5	3.4	5.0	
M 7	1	80	17	5.5	4.3	6.0	
M 8	1.25	90	20	6	4.9	6.8	
M 9	1.25	90	20	7	5.5	7.8	
M 10	1.5	100	22	7	5.5	8.5	
M 12	1.75	110	24	9	7	10.2	■
M 14	2	110	26	11	9	12.0	
M 16	2	110	27	12	9	14.0	■
M 18	2.5	125	30	14	11	15.5	
M 20	2.5	140	32	16	12	17.5	■
M 22	2.5	140	32	18	14.5	19.5	
M 24	3	160	34	18	14.5	21.0	
M 27	3	160	36	20	16	24.0	
M 30	3.5	180	40	22	18	26.5	
M 33	3.5	180	40	25	20	29.5	
M 36	4	200	50	28	22	32.0	

Machine Taps Yellow Ring

DIN 371 HSS-E PM

RH spiral flutes 20°
for titanium alloys

Group 3280
for blind holes



Cutting Data



Art.-No.							32800					
Technology		Page 8.1					PM-Line 					
Chamfer Length		Page 8.4					Yellow Ring					
Surface		Page 8.2					3-4 x P					
Tolerance		Page 8.5					bright					
Cutting Data		Page 8.6					ISO2 (6H)					
							P2 high strength steel S1 titanium alloys					

Ø d ₁	P _{mm}	L ₁	L ₂	d ₂			
M 1.7	0.35	40	8	2.5	2.1	1.35	
M 1.8	0.35	40	8	2.5	2.1	1.45	
M 2	0.4	45	8	2.8	2.1	1.6	
M 2.2	0.45	45	8	2.8	2.1	1.75	
M 2.3	0.4	45	8	2.8	2.1	1.9	
M 2.5	0.45	50	9	2.8	2.1	2.05	
M 2.6	0.45	50	9	2.8	2.1	2.15	
M 3	0.5	56	11	3.5	2.7	2.5	
M 3.5	0.6	56	12	4	3	2.9	
M 4	0.7	63	13	4.5	3.4	3.3	
M 5	0.8	70	15	6	4.9	4.2	
M 6	1	80	17	6	4.9	5.0	
M 7	1	80	17	7	5.5	6.0	
M 8	1.25	90	20	8	6.2	6.8	
M 9	1.25	90	20	9	7	7.8	
M 10	1.5	100	22	10	8	8.5	

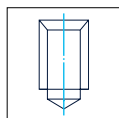
Machine Taps

DIN 371 HSS-E

RH spiral flutes 40°
for general construction steel

Group 3300
for blind holes

STEEL

2xd₁

Cutting Data



Art.-No.

Technology Page 8.1

Chamfer Length Page 8.4

Surface Page 8.2

Tolerance Page 8.5

Cutting Data Page 8.6

33000
High Volume

33000 B

33000 E

C / 2-3 x P

bright
ISO2 (6H) | ISO1 (4H)bright
ISO3 (6G)bright
7G

P1 general construction steel K2+K3 spheroidal and malleable cast iron

Ø d ₁	P _{mm}	L ₁	L ₂	d ₂		
M 1	0.25	40	5.5	2.5	2.1	0.75
M 1.2	0.25	40	5.5	2.5	2.1	0.95
M 1.4	0.3	40	7	2.5	2.1	1.1
M 1.6	0.35	40	8	2.5	2.1	1.25
M 1.7	0.35	40	8	2.5	2.1	1.35
M 1.8	0.35	40	8	2.5	2.1	1.45
M 2	0.4	45	8	2.8	2.1	1.6
M 2.2	0.45	45	8	2.8	2.1	1.75
M 2.3	0.4	45	8	2.8	2.1	1.9
M 2.5	0.45	50	9	2.8	2.1	2.05
M 2.6	0.45	50	9	2.8	2.1	2.15

Continuation »

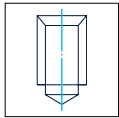
Machine Taps

DIN 371 HSS-E

RH spiral flutes 40°
for general construction steel

Group 3300
for blind holes

STEEL

 $2x d_1$ 

Cutting Data



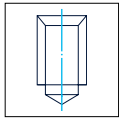
Machine Taps

DIN 371 HSS-E

RH spiral flutes 40°
for general construction steel

Group 3300
for blind holes

STEEL

2xd₁

Art.-No.

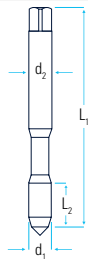
Technology Page 8.1

Chamfer Length Page 8.4

Surface Page 8.2

Tolerance Page 8.5

Cutting Data Page 8.6



High Speed Cutting by Schumacher

Cutting Data



Ø d ₁	P _{mm}	L ₁	L ₂	d ₂					
M 1.7	0.35	40	8	2.5	2.1	1.35			
M 1.8	0.35	40	8	2.5	2.1	1.45			
M 2	0.4	45	8	2.8	2.1	1.6			
M 2.2	0.45	45	8	2.8	2.1	1.75			
M 2.3	0.4	45	8	2.8	2.1	1.9			
M 2.5	0.45	50	9	2.8	2.1	2.05			
M 2.6	0.45	50	9	2.8	2.1	2.15			
M 3	0.5	56	6	3.5	2.7	2.5	■	■	■
M 3.5	0.6	56	7	4	3	2.9			
M 4	0.7	63	7	4.5	3.4	3.3	■	■	■
M 5	0.8	70	8	6	4.9	4.2	■	■	■
M 6	1	80	10	6	4.9	5.0	■	■	■
M 7	1	80	10	7	5.5	6.0			
M 8	1.25	90	13	8	6.2	6.8	■	■	■
M 9	1.25	90	13	9	7	7.8			
M 10	1.5	100	15	10	8	8.5	■	■	■

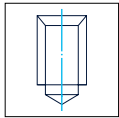
Machine Taps

DIN 376 HSS-E

RH spiral flutes 40°
for general construction steel

Group 4300
for blind holes

STEEL

2xd₁

Cutting Data



Art.-No.

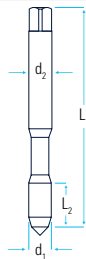
Technology Page 8.1

Chamfer Length Page 8.4

Surface Page 8.2

Tolerance Page 8.5

Cutting Data Page 8.6



43000/25

High Volume

43000/42

2 x L1

C / 2-3 x P

TiN

bright

ISO2 (6H)

ISO2 (6H)

P1 general construction steel K2+K3 spheroidal and malleable cast iron

Ø d ₁	P _{mm}	L ₁	L ₂	d ₂		
M 6	1	80	10	4.5	3.4	5.0
M 7	1	80	10	5.5	4.3	6.0
M 8	1.25	90	14	6	4.9	6.8
M 9	1.25	90	14	7	5.5	7.8
M 10	1.5	100	16	7	5.5	8.5
M 12	1.75	110	18	9	7	10.2
M 14	2	110	20	11	9	12.0
M 16	2	110	20	12	9	14.0
M 18	2.5	125	25	14	11	15.5
M 20	2.5	140	25	16	12	17.5
M 22	2.5	140	25	18	14.5	19.5
M 24	3	160	30	18	14.5	21.0
M 27	3	160	30	20	16	24.0
M 30	3.5	180	35	22	18	26.5
M 33	3.5	180	35	25	20	29.5
M 36	4	200	40	28	22	32.0

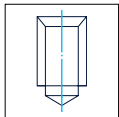
Machine Taps - BLIZZARD

DIN 371 HSS-E-PM

RH spiral flutes 45°
for general construction steel

Group 3301
for blind holes

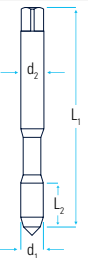
STEEL

 $3x d_1$ 

High Speed Cutting
by Schumacher

Cutting Data



Art.-No.							33010/6368
Technology		Page 8.1					PM-Line 
Chamfer Length		Page 8.4					C / 2-3 x P
Surface		Page 8.2					SG 7
Tolerance		Page 8.5					6HX
Cutting Data		Page 8.6					P1 general construction steel N1 aluminium alloys N6 thermoplastics
							
Ø d ₁	P _{mm}	L ₁	L ₂	d ₂			
M 1.7	0.35	40	8	2.5	2.1	1.35	
M 1.8	0.35	40	8	2.5	2.1	1.45	
M 2	0.4	45	8	2.8	2.1	1.6	
M 2.2	0.45	45	8	2.8	2.1	1.75	
M 2.3	0.4	45	8	2.8	2.1	1.9	
M 2.5	0.45	50	9	2.8	2.1	2.05	
M 2.6	0.45	50	9	2.8	2.1	2.15	
M 3	0.5	56	6	3.5	2.7	2.5	
M 3.5	0.6	56	7	4	3	2.9	
M 4	0.7	63	7	4.5	3.4	3.3	
M 5	0.8	70	8	6	4.9	4.2	
M 6	1	80	10	6	4.9	5.0	
M 7	1	80	10	7	5.5	6.0	
M 8	1.25	90	13	8	6.2	6.8	
M 9	1.25	90	13	9	7	7.8	
M 10	1.5	100	15	10	8	8.5	

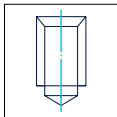
Machine Taps - BLIZZARD

DIN 376 HSS-E-PM

RH spiral flutes 45°
for general construction steel

Group 4301
for blind holes

STEEL

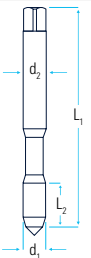
 $3x d_1$ 

High Speed Cutting
by Schumacher

Cutting Data



Art.-No.		43010/63				
Technology	 Page 8.1	PM-Line 				
Chamfer Length	 Page 8.4	C / 2-3 x P				
Surface	 Page 8.2	SG 7				
Tolerance	 Page 8.5	6HX				
Cutting Data	 Page 8.6	P1 general construction steel N1 aluminium alloys N6 thermoplastics				



Ø d ₁	P _{mm}	L ₁	L ₂	d ₂		
M 6	1	80	10	4.5	3.4	5.0
M 7	1	80	10	5.5	4.3	6.0
M 8	1.25	90	14	6	4.9	6.8
M 9	1.25	90	14	7	5.5	7.8
M 10	1.5	100	16	7	5.5	8.5
M 12	1.75	110	18	9	7	10.2
M 14	2	110	20	11	9	12.0
M 16	2	110	20	12	9	14.0
M 18	2.5	125	25	14	11	15.5
M 20	2.5	140	25	16	12	17.5
M 22	2.5	140	25	18	14.5	19.5
M 24	3	160	30	18	14.5	21.0
M 27	3	160	30	20	16	24.0
M 30	3.5	180	35	22	18	26.5
M 33	3.5	180	35	25	20	29.5
M 36	4	200	40	28	22	32.0

■ available – intermediate size on request

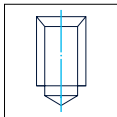
Machine Taps - NUMERIC

DIN 371 HSS-E PM

RH spiral flutes 45°
for steel

Group 3303
for blind holes

STEEL

 $2x d_1$ 

High Speed Cutting
by Schumacher



High Speed Cutting
for Schumacher

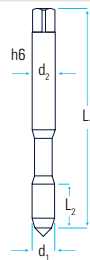
DIN 1835-B



NUMERIC
Supporting Digital Production

For use on CNC machines
with synchronized machining

Art.-No.		
Technology		Page 8.1
Chamfer Length		Page 8.4
Surface		Page 8.2
Tolerance		Page 8.5
Cutting Data		Page 8.6



33030/48	33030/4048
PM-Line 	PM-Line 
	internal coolant
C / 2-3 x P	
TiCN	TiCN
6HX	6HX
P1 general construction steel	P2 high strength steel
	M1 chemical resistant steel

[illegible]

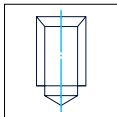
Machine Taps - NUMERIC

DIN 376 HSS-E PM

RH spiral flutes 45°
for steel

Group 4303
for blind holes

STEEL

 $2x d_1$ 

High Speed Cutting
by Schumacher

Cutting Data

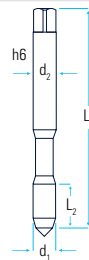


NUMERIC

Supporting Digital Production

For use on CNC machines
with synchronized machining

Art.-No.

Technology  Page 8.1Champfer Length  Page 8.4Surface Page 8.2Tolerance Page 8.5Cutting Data  Page 8.6

43030/48

PM-Line

C / 2-3 x P

TiCN

6HX

P1 general construction steel P2 high strength steel M1 chemical resistant steeltant steel

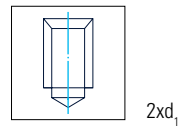
■ available – intermediate size on request

Machine Taps Black Ring

DIN 371 HSS-E

RH spiral flutes 40°
for universal use

Group 3330
for blind holes



Cutting Data



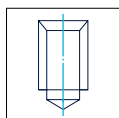
Machine Taps Black Ring

DIN 371 HSS-E

RH spiral flutes 40°
for universal use

Group 3330
for blind holes

UNI

 $2x d_1$ 

Cutting Data



Art.-No.

Technology  Page 8.1Champfer Length Page 8.4Surface  Page 8.2Tolerance Page 8.5Cutting Data  Page 8.6

33300/26

High Volume 

Black Ring

C / 2-3 x P

VAP

IS02 (6H)

P1 general construction steel

33300/25

High Volume 

Black Ring

C / 2-3 x P

TiN

IS02 (6H)

M1 chemical resistant steel

N1 aluminium alloys N3 copper alloys

[illegible]

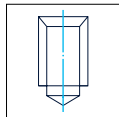
■ available – intermediate size on request

Machine Taps Black Ring

DIN 376 HSS-E

RH spiral flutes 40°
for universal use

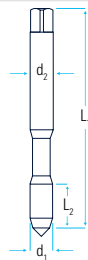
Group 4330
for blind holes

 $2x d_1$ 

Cutting Data



Art.-No.

Technology  Page 8.1Champfer Length  Page 8.4Surface Page 8.2Tolerance Page 8.5Cutting Data  Page 8.6

43300/26

High Volume

Black Ring

C / 2-3 x P

VAP

ISO2 (6H)

P1 general construction steel M1 chemical resistant steel N1 aluminium alloys N3 copper alloys

43300/25

High Volume

Black Ring

TiN

IS02 (6H)

N1 aluminium alloys N3 copper alloys

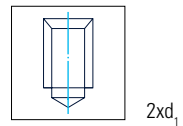
[illegible]

Machine Taps Black Ring

DIN 371 HSS-E-PM

RH spiral flutes 40°
for universal use

Group 3330
for blind holes



Cutting Data



Art.-No.

Technology

i

Page 8.1

Chamfer Length

i

Page 8.4

Surface

i

Page 8.2

Tolerance

i

Page 8.5

Cutting Data

i

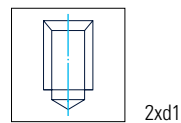
Page 8.6

Machine Taps Black Ring

DIN 376 HSS-E PM

RH spiral flutes 45°
for high strength steel

Group 43300
for blind holes



Cutting Data

[illegible]

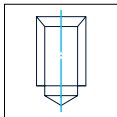
Machine Taps Blue Ring

DIN 371 HSS-E

RH spiral flutes 40°
for chemical resistant steel

Group 3350
for blind holes

INOX
Stainless

 $2x d_1$ 

Cutting Data



Art.-No.									
Technology		Page 8.1							
Chamfer Length		Page 8.4							
Surface		Page 8.2							
Tolerance		Page 8.5							
Cutting Data		Page 8.6							

33500/26	33500/25
High Volume	High Volume
Blue Ring	Blue Ring
C / 2-3 x P	
VAP	TiN
ISO2 (6H)	ISO2 (6H)
P2 high strength steel	M1 chemical resistant steel

Ø d ₁	P _{mm}	L ₁	L ₂	d ₂															
M 1.7	0.35	40	8	2.5	2.1	1.35													
M 1.8	0.35	40	8	2.5	2.1	1.45													
M 2	0.4	45	8	2.8	2.1	1.6													
M 2.2	0.45	45	8	2.8	2.1	1.75													
M 2.3	0.4	45	8	2.8	2.1	1.9													
M 2.5	0.45	50	9	2.8	2.1	2.05													
M 2.6	0.45	50	9	2.8	2.1	2.15													
M 3	0.5	56	6	3.5	2.7	2.5													
M 3.5	0.6	56	7	4	3	2.9													
M 4	0.7	63	7	4.5	3.4	3.3													
M 5	0.8	70	8	6	4.9	4.2													
M 6	1	80	10	6	4.9	5.0													
M 7	1	80	10	7	5.5	6.0													
M 8	1.25	90	13	8	6.2	6.8													
M 9	1.25	90	13	9	7	7.8													
M 10	1.5	100	15	10	8	8.5													

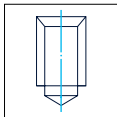
Machine Taps Blue Ring

DIN 376 HSS-E

RH spiral flutes 40°
for chemical resistant steel

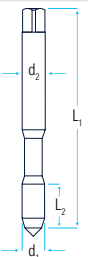
Group 4350
for blind holes

INOX
Stainless

 $2x d_1$ 

Cutting Data



Art.-No.							43500/26		43500/25		
Technology	 Page 8.1						High Volume 		High Volume 		
Chamfer Length	 Page 8.4						Blue Ring		Blue Ring		
Surface	 Page 8.2						C / 2-3 x P				
Tolerance	 Page 8.5						VAP		TiN		
Cutting Data	 Page 8.6						ISO2 (6H)		ISO2 (6H)		
		P2 high strength steel		M1 chemical resistant steel							
Ø d ₁	P _{mm}	L ₁	L ₂	d ₂							
M 6	1	80	10	4.5	3.4	5.0					
M 7	1	80	10	5.5	4.3	6.0					
M 8	1.25	90	14	6	4.9	6.8					
M 9	1.25	90	14	7	5.5	7.8					
M 10	1.5	100	16	7	5.5	8.5					
M 12	1.75	110	18	9	7	10.2					
M 14	2	110	20	11	9	12.0					
M 16	2	110	20	12	9	14.0					
M 18	2.5	125	25	14	11	15.5					
M 20	2.5	140	25	16	12	17.5					
M 22	2.5	140	25	18	14.5	19.5					
M 24	3	160	30	18	14.5	21.0					
M 27	3	160	30	20	16	24.0					
M 30	3.5	180	35	22	18	26.5					
M 33	3.5	180	35	25	20	29.5					
M 36	4	200	40	28	22	32.0					

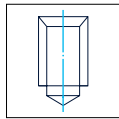
Machine Taps Blue Ring - POLAR

DIN 376 HSS-E PM

RH spiral flutes 45°
for chemical resistant steel

Group 4351
for deep blind holes $\leq 2.5 \times d_1$

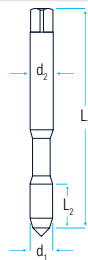
INOX
Stainless

 $2,5x d_1$ 

Cutting Data



Art.-No.

Technology  Page 8.1Champfer Length  Page 8.4Surface Page 8.2Tolerance  Page 8.5Cutting Data  Page 8.6

43510/48

PM-Line

Blue Ring

C / 2-3 x P

TiCN

6HX

P2 high strength steel M1+M2 chemical resistant steel

[illegible]

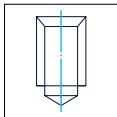
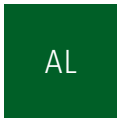
■ available – intermediate size on request

Machine Taps - MISTRAL

DIN 371 HSS-E PM

RH spiral flutes 45°
for aluminium and bronze alloys

Group 3360
for blind holes



2xd₁

Cutting Data



DLC

Diamond like Carbon

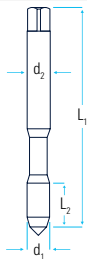
Innovative surface coating technologies with high hardness and low frictional coefficient



High Speed Cutting
by Schumacher



High Speed Cutting
by Schumacher



Art.-No.

Technology Page 8.1

Chamfer Length Page 8.4

Surface Page 8.2

Tolerance Page 8.5

Cutting Data Page 8.6

33600/02

PM-Line

33600/24

PM-Line

C / 2-3 x P

CrN

DLC

ISO2 (6H)

ISO2 (6H)

N1 aluminium alloys N6 thermoplastics

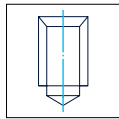
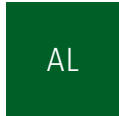
Ø d ₁	P _{mm}	L ₁	L ₂	d ₂		
M 1.7	0.35	40	8	2.5	2.1	1.35
M 1.8	0.35	40	8	2.5	2.1	1.45
M 2	0.4	45	8	2.8	2.1	1.6
M 2.2	0.45	45	8	2.8	2.1	1.75
M 2.3	0.4	45	8	2.8	2.1	1.9
M 2.5	0.45	50	9	2.8	2.1	2.05
M 2.6	0.45	50	9	2.8	2.1	2.15
M 3	0.5	56	6	3.5	2.7	2.5
M 3.5	0.6	56	7	4	3	2.9
M 4	0.7	63	7	4.5	3.4	3.3
M 5	0.8	70	8	6	4.9	4.2
M 6	1	80	10	6	4.9	5.0
M 7	1	80	10	7	5.5	6.0
M 8	1.25	90	13	8	6.2	6.8
M 9	1.25	90	13	9	7	7.8
M 10	1.5	100	15	10	8	8.5

Machine Taps - MISTRAL

DIN 376 HSS-E PM

RH spiral flutes 45°
for aluminium and bronze alloys

Group 4360
for blind holes

 $2x d_1$ 

High Speed Cutting
by Schumacher



High Speed Cutting 
by Schumacher

Cutting Data



DLC

Diamond like Carbon

Innovative surface coating technologies with high hardness and low frictional coefficient

Art.-No.							43600/02	43600/24
Technology		Page 8.1						
Chamfer Length		Page 8.4						
Surface		Page 8.2						
Tolerance		Page 8.5						
Cutting Data		Page 8.6						

PM-Line 	PM-Line 
C / 2-3 x P	
CrN	DLC
ISO2 (6H)	ISO2 (6H)
N1 aluminium alloys	N6 thermoplastics

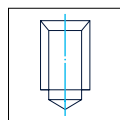
Ø d ₁	P _{mm}	L ₁	L ₂	d ₂		
M 6	1	80	10	4.5	3.4	5.0
M 7	1	80	10	5.5	4.3	6.0
M 8	1.25	90	14	6	4.9	6.8
M 9	1.25	90	14	7	5.5	7.8
M 10	1.5	100	16	7	5.5	8.5
M 12	1.75	110	18	9	7	10.2
M 14	2	110	20	11	9	12.0
M 16	2	110	20	12	9	14.0
M 18	2.5	125	25	14	11	15.5
M 20	2.5	140	25	16	12	17.5
M 22	2.5	140	25	18	14.5	19.5
M 24	3	160	30	18	14.5	21.0
M 27	3	160	30	20	16	24.0
M 30	3.5	180	35	22	18	26.5
M 33	3.5	180	35	25	20	29.5
M 36	4	200	40	28	22	32.0

Machine Taps Red Ring

DIN 371 HSS-E

RH spiral flutes 40°
for high strength steel

Group 3380
for blind holes

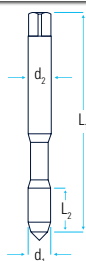
 $2x d_1$ 

Cutting Data



Art.-No.

Technology		Page 8.1
Chamfer Length		Page 8.4
Surface		Page 8.2
Tolerance		Page 8.5
Cutting Data		Page 8.6



33800	33800/48
High Volume 	High Volume 
Red Ring	Red Ring
C / 2-3 x P	
bright	TiCN
ISO2 (6H)	ISO2 (6H)
P2 high strength steel	

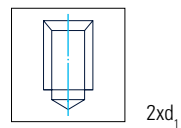
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Machine Taps Red Ring

DIN 376 HSS-E

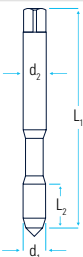
RH spiral flutes 40°
for high strength steel

Group 4380
for blind holes



Cutting Data



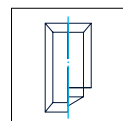
Art.-No.							43800		43800/48		
Technology	 Page 8.1						High Volume 		High Volume 		
Chamfer Length	 Page 8.4						Red Ring		Red Ring		
Surface	 Page 8.2						C / 2-3 x P				
Tolerance	 Page 8.5						bright		TiCN		
Cutting Data	 Page 8.6						ISO2 (6H)		ISO2 (6H)		
							P2 high strength steel				
Ø d ₁	P _{mm}	L ₁	L ₂	d ₂							
M 6	1	80	10	4.5	3.4	5.0					
M 7	1	80	10	5.5	4.3	6.0					
M 8	1.25	90	14	6	4.9	6.8					
M 9	1.25	90	14	7	5.5	7.8					
M 10	1.5	100	16	7	5.5	8.5					
M 12	1.75	110	18	9	7	10.2					
M 14	2	110	20	11	9	12.0					
M 16	2	110	20	12	9	14.0					
M 18	2.5	125	25	14	11	15.5					
M 20	2.5	140	25	16	12	17.5					
M 22	2.5	140	25	18	14.5	19.5					
M 24	3	160	30	18	14.5	21.0					
M 27	3	160	30	20	16	24.0					
M 30	3.5	180	35	22	18	26.5					
M 33	3.5	180	35	25	20	29.5					
M 36	4	200	40	28	22	32.0					

Forming Taps Black Ring - TORNADO

DIN 376 HSS-E PM

straight oil grooves for steel, heat treatable steel
and chemical resistant steel

Group 4050
for blind and through holes

 $2x d_1$ 

Cutting Data

[illegible]

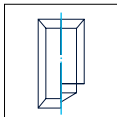
Forming Taps - MISTRAL

DIN 371 HSS-E PM

straight oil grooves for aluminium
and bronze alloys

Group 3051
for blind and through holes

AL

 $2x d_1$ 

High Speed Cutting
by Schumacher



High Speed Cutting

Cutting Data

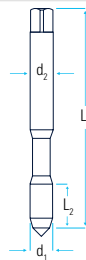


DLC

Diamond like Carbon

Innovative surface coating technologies with high hardness and low frictional coefficient

Art.-No.		
Technology		Page 8.1
Chamfer Length		Page 8.4
Surface		Page 8.2
Tolerance		Page 8.5
Cutting Data		Page 8.6



30510/0253	30510/2453
PM-Line 	PM-Line 
C / 2-3 x P	
CrN	DLC
6HX	6HX
N1 aluminium alloys	N5 Bronze alloys N6 thermoplastics

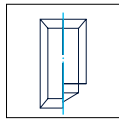
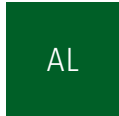
Ø d ₁	P _{mm}	L ₁	L ₂	d ₂	□	▨											
M 1.7	0.35	40	8	2.5	2.1	1.55											
M 1.8	0.35	40	8	2.5	2.1	1.65											
M 2	0.4	45	8	2.8	2.1	1.85											
M 2.2	0.45	45	8	2.8	2.1	2.0											
M 2.3	0.4	45	8	2.8	2.1	2.1											
M 2.5	0.45	50	9	2.8	2.1	2.3											
M 2.6	0.45	50	9	2.8	2.1	2.4											
M 3	0.5	56	11	3.5	2.7	2.8		■						■			
M 3.5	0.6	56	12	4	3	3.25											
M 4	0.7	63	13	4.5	3.4	3.7		■						■			
M 5	0.8	70	15	6	4.9	4.65		■						■			
M 6	1	80	17	6	4.9	5.55		■						■			
M 7	1	80	17	7	5.5	6.55											
M 8	1.25	90	20	8	6.2	7.4		■						■			
M 9	1.25	90	20	9	7	8.4											
M 10	1.5	100	22	10	8	9.3		■						■			

Forming Taps - MISTRAL

DIN 376 HSS-E PM

straight oil grooves for aluminium
and bronze alloys

Group 4051
for blind and through holes

 $2x d_1$ 

High Speed Cutting
by Schumacher



High Speed Cutting 
by Schumacher

Cutting Data



DLC

Diamond like Carbon

Innovative surface coating technologies with high hardness and low frictional coefficient

[illegible]

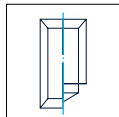
Forming Taps - NUMERIC

DIN 371 HSS-E PM

straight oil grooves for steel, heat treatable steel
and chemical resistant steel

Group 3053
for blind and through holes

STEEL

 $2x d_1$ 

High Speed Cutting
by Schumacher

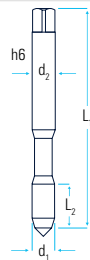
Cutting Data



NUMERIC
Supporting Digital Production

For use on CNC machines
with synchronized machining

Art.-No.		
Technology		Page 8.1
Chamfer Length		Page 8.4
Surface		Page 8.2
Tolerance		Page 8.5
Cutting Data		Page 8.6



30530/4853			
PM-Line			
C / 2-3 x P			
TiCN			
6HX			
P1 general construction steel	P2 high strength steel	M1 chemical resistant steel	

[illegible]

■ available – intermediate size on request

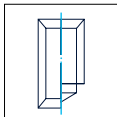
Forming Taps - NUMERIC

DIN 376 HSS-E PM

straight oil grooves for steel, heat treatable steel
and chemical resistant steel

Group 4053
for blind and through holes

STEEL

 $2x d_1$ 

High Speed Cutting
by Schumacher

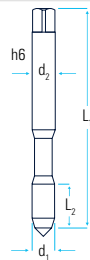
Cutting Data



NUMERIC
Supporting Digital Production

For use on CNC machines
with synchronized machining

Art.-No.

Technology  Page 8.1Champfer Length  Page 8.4Surface Page 8.2Tolerance Page 8.5Cutting Data  Page 8.6

40530/4853

PM-Line

C / 2-3 x P

TiCN

6HX

P1 general construction steel P2 high strength steel M1 chemical resistant steel

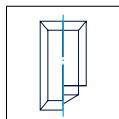
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Forming Taps - CONDOR

DIN 371 HSS-E PM

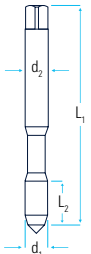
straight oil grooves for high strength steel, heat treatable steel
and chemical resistant steel

Group 3055
for blind and through holes

 $2x d_1$ 

Cutting Data



Art.-No.				30550/5367			
Technology	 Page 8.1			PM-Line 			
Chamfer Length	 Page 8.4			Red Ring			
Surface	 Page 8.2			C / 2-3 x P			
Tolerance	 Page 8.5			SG 6			
Cutting Data	 Page 8.6			6HX			
				P3 high strength steel		M1 chemical resistant steel	S1 titanium alloys

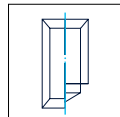
Ø d ₁	P _{mm}	L ₁	L ₂	d ₂		
M 1.7	0.35	40	8	2.5	2.1	1.55
M 1.8	0.35	40	8	2.5	2.1	1.65
M 2	0.4	45	8	2.8	2.1	1.85
M 2.2	0.45	45	8	2.8	2.1	2.0
M 2.3	0.4	45	8	2.8	2.1	2.1
M 2.5	0.45	50	9	2.8	2.1	2.3
M 2.6	0.45	50	9	2.8	2.1	2.4
M 3	0.5	56	6	3.5	2.7	2.8
M 3.5	0.6	56	7	4	3	3.25
M 4	0.7	63	7	4.5	3.4	3.7
M 5	0.8	70	8	6	4.9	4.65
M 6	1	80	10	6	4.9	5.55
M 7	1	80	10	7	5.5	6.55
M 8	1.25	90	13	8	6.2	7.4
M 9	1.25	90	13	9	7	8.4
M 10	1.5	100	15	10	8	9.3

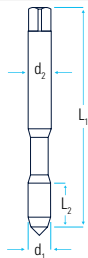
Forming Taps - CONDOR

DIN 376 HSS-E PM

straight oil grooves for high strength steel, heat treatable steel
and chemical resistant steel

Group 4055
for blind and through holes

 $2x d_1$ 

Art-No.						
Technology ⓘ Page 8.1						
Chamfer Length ⓘ Page 8.4						
Surface ⓘ Page 8.2						
Tolerance ⓘ Page 8.5						
Cutting Data ⓘ Page 8.6						
						
40550/5367						
PM-Line ⓘ						
Red Ring						
C / 2-3 x P						
SG 6						
6HX						
P3 high strength steel M1 chemical resistant steel S1 titanium alloys						

Ø d ₁	P _{mm}	L ₁	L ₂	d ₂		
M 6	1	80	17	4.5	3.4	5.55
M 7	1	80	17	5.5	4.3	6.55
M 8	1.25	90	20	6	4.9	7.4
M 9	1.25	90	20	7	5.5	8.4
M 10	1.5	100	22	7	5.5	9.3
M 12	1.75	110	24	9	7	11.2
M 14	2	110	26	11	9	13.1
M 16	2	110	27	12	9	15.1
M 18	2.5	125	30	14	11	16.9
M 20	2.5	140	32	16	12	18.9
M 22	2.5	140	32	18	14.5	20.9
M 24	3	160	34	18	14.5	22.65
M 27	3	160	36	20	16	25.65

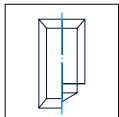
Forming Taps

DIN 371 HSS-E

straight oil grooves for steel, non-ferrous steel
and heat treatable steel

Group 3060
for blind and through holes

STEEL

 $2x d_1$ 

High Speed Cutting
by Schumacher



High Speed Cutting
by Schumacher

Cutting Data



Art.-No.

Technology

Chamfer Length

Surface

Tolerance

Cutting Data

Page 8.1

Page 8.4

Page 8.2

Page 8.5

Page 8.6

</

■ without oil grooves ■ available – intermediate size on request

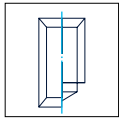
Forming Taps

DIN 371 HSS-E

straight oil grooves for steel, non-ferrous steel
and heat treatable steel

Group 3060
for blind and through holes

STEEL

 $2x d_1$ 

High Speed Cutting 
by Schumacher



High Speed Cutting
by Schumacher

Cutting Data

[illegible]

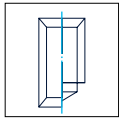
Forming Taps

DIN 376 HSS-E

straight oil grooves for steel, non-ferrous steel
and heat treatable steel

Group 4060
for blind and through holes

STEEL

2xd₁

Cutting Data



High Speed Cutting
by Schumacher

Art.-No.

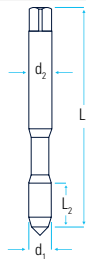
Technology Page 8.1

Chamfer Length Page 8.4

Surface Page 8.2

Tolerance Page 8.5

Cutting Data Page 8.6



40600/53

High Volume

40600/2553

High Volume

C / 2-3 x P

bright

TiN

6HX

6HX

P1 general construction steel P2 high strength steel N3 copper alloys

Ø d ₁	P _{mm}	L ₁	L ₂	d ₂		
M 6	1	80	17	4.5	3.4	5.55
M 7	1	80	17	5.5	4.3	6.55
M 8	1.25	90	20	6	4.9	7.4
M 9	1.25	90	20	7	5.5	8.4
M 10	1.5	100	22	7	5.5	9.3
M 12	1.75	110	24	9	7	11.2
M 14	2	110	26	11	9	13.1
M 16	2	110	27	12	9	15.1
M 18	2.5	125	30	14	11	16.9
M 20	2.5	140	32	16	12	18.9
M 22	2.5	140	32	18	14.5	20.9
M 24	3	160	34	18	14.5	22.65
M 27	3	160	36	20	16	25.65

Cutting Data

 $2x d_1$ Cutting Data Page 8.6[illegible]

■ available – intermediate size on request

Cutting Data

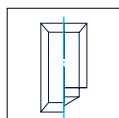


DIN 352 HSS

set of 3 pieces, straight flutes
for general construction steel

Group 1000
for blind and through holes

STEEL

 $2x d_1$ 

Art.-No.

Technology  Page 8.1Champfer Length Page 8.4

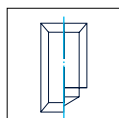
Page 8.2

Tolerance Page 8.5Cutting Data Page 8.6

10100	10200	10300
High Volume 🌐	High Volume 🌐	High Volume 🌐
D / 3,5-5 x P	3-4 x P	C / 2-3 x P
bright	bright	bright
Nr. 1	Nr. 2	Nr. 3 = ISO2 (6H)
P1 general construction steel	K2+K3 spheroidal and malleable cast iron	

[illegible]

Cutting Data



10105	10205	10305
LH	LH	LH
D / 3,5-5 x P	3-4 x P	C / 2-3 x P
bright	bright	bright
Nr. 1	Nr. 2	Nr. 3 = ISO2 (6H)
P1 general construction steel	K2+K3 spheroidal and malleable cast iron	

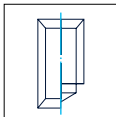
Ø d ₁	P _{mm}	L ₁	L ₂	d ₂	□	⬡							
M 2	0.4	36	8	2.8	2.1	1.6		■		■			■
M 2.2	0.45	36	9	2.8	2.1	1.75							
M 2.3	0.4	36	9	2.8	2.1	1.9							
M 2.5	0.45	40	9	2.8	2.1	2.05		■		■			■
M 2.6	0.45	40	9	2.8	2.1	2.15							
M 3	0.5	40	11	3.5	2.7	2.5		■		■			■
M 4	0.7	45.5	13	4.5	3.4	3.3		■		■			■
M 5	0.8	52	16	6	4.9	4.2		■		■			■
M 6	1	56	18	6	4.9	5.0		■		■			■

Set of Taps

DIN 352 HSS

set of 3 pieces, straight flutes
for general construction steel

Group 1000 LH
for blind and through holes



2x d_1

Cutting Data



Art.-No.

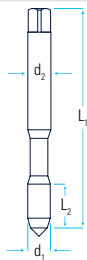
Technology Page 8.1

Chamfer Length Page 8.4

Surface Page 8.2

Tolerance Page 8.5

Cutting Data Page 8.6



10105

10205

10305

LH

LH

LH

D / 3,5-5 x P

3-4 x P

C / 2-3 x P

bright

bright

bright

Nr. 1

Nr. 2

Nr. 3 = ISO2 (6H)

P1 general construction steel K2+K3 spheroidal and malleable cast iron

$\varnothing d_1$

P_{mm}

L_1

L_2

d_2

M 7

1

56

18

6

4.9

6.0

M 8

1.25

63

20

6

4.9

6.75

M 9

1.25

63

20

7

5.5

7.75

M 10

1.5

70

22

7

5.5

8.5

M 12

1.75

80

24

9

7

10.25

M 14

2

80

26

11

9

12.0

M 16

2

80

27

12

9

14.0

M 18

2.5

95

30

14

11

15.5

M 20

2.5

95

32

16

12

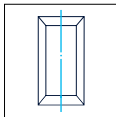
17.5

Set of Taps

DIN 352 HSS-E

set of 3 pieces, straight flutes
for high strength steel

Group 2000
for through holes



2x d₁

Art.-No.

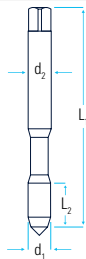
Technology Page 8.1

Chamfer Length Page 8.4

Surface Page 8.2

Tolerance Page 8.5

Cutting Data Page 8.6



Cutting Data



20100	20200	20300
D / 3,5-5 x P	3-4 x P	C / 2-3 x P
bright	bright	bright
Nr. 1	Nr. 2	Nr. 3 = ISO2 (6H)
P2 high strength steel		

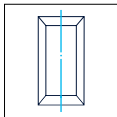
Ø d ₁	P _{mm}	L ₁	L ₂	d ₂						
M 3	0.5	40	11	3.5	2.7	2.5	■		■	■
M 4	0.7	45	13	4.5	3.4	3.3	■		■	■
M 5	0.8	52	16	6	4.9	4.2	■		■	■
M 6	1	56	18	6	4.9	5.0	■		■	■
M 7	1	56	18	6	4.9	6.0				
M 8	1.25	63	20	6	4.9	6.75	■		■	■
M 9	1.25	63	20	7	5.5	7.75				
M 10	1.5	70	22	7	5.5	8.5	■		■	■
M 12	1.75	80	24	9	7	10.25	■		■	■
M 14	2	80	26	11	9	12.0				
M 16	2	80	27	12	9	14.0	■		■	■
M 18	2.5	95	30	14	11	15.5				
M 20	2.5	95	32	16	12	17.5	■		■	■

Carbide Machine Taps

DIN 371/376 VHM

straight flutes
for hard materials

Group G010
for through holes



2xd₁

Cutting Data



Art.-No.

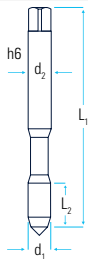
Technology Page 8.1

Chamfer Length Page 8.4

Surface Page 8.2

Tolerance Page 8.5

Cutting Data Page 8.6



G0100/41

VHMtec

Internal coolant radial

5-6 x P

bright

6HX

K1 grey cast iron N3 copper alloys H1 hard materials

Ø d ₁	P _{mm}	L ₁	L ₂	d ₂		
M 3	0.5	56	11	3.5	2.7	2.5
M 3.5	0.6	56	12	4	3	2.9
M 4	0.7	63	13	4.5	3.4	3.3
M 5	0.8	70	15	6	4.9	4.2
M 6	1	80	17	6	4.9	5.0
M 7	1	80	17	7	5.5	6.0
M 8	1.25	90	20	8	6.2	6.8
M 9	1.25	90	20	9	7	7.8
M 10	1.5	100	22	10	8	8.5
M 12	1.75	110	24	9	7	10.2
M 16	2	110	27	12	9	14.0

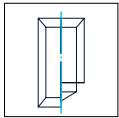
Carbide Machine Taps

DIN 371/376 VHM

straight flutes
for hard materials

Group G080
for blind and through holes

HARD

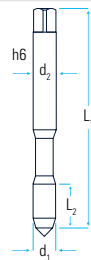
 $2x d_1$ 

Cutting Data



VHM tec
CARBIDE by Schumacher

Art-No.		
Technology		Page 8.1
Chamfer Length		Page 8.4
Surface		Page 8.2
Tolerance		Page 8.5
Cutting Data		Page 8.6



G0800	G0800/40
VHM 	VHM 
	Internal coolant
3-4 x P	
bright	bright
6HX	6HX
K1 grey cast iron	N3 copper alloys H1 hard materials

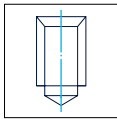
[illegible]

Carbide Machine Taps

DIN 371/376 VHM

RH spiral flutes 20°
for universal use

Group G260
for blind holes

 $2x d_1$ 

Cutting Data

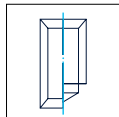
[illegible]

Carbide Forming Taps

DIN 371/376 VHM

straight oil grooves
for high strength steel

Group G060/G070
for blind and through holes

 $2x d_1$ 

Cutting Data

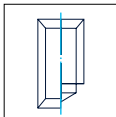
[illegible]

Machine Taps

DIN 374 HSS-E

straight flutes
for general construction steel

Group 5000
for blind and through holes



2xd₁



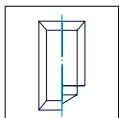
Cutting Data



Art.-No.								50000							
Technology	Page 8.1														
Chamfer Length	Page 8.4							C / 2-3 x P							
Surface	Page 8.2							bright							
Tolerance	Page 8.5							ISO2 (6H)							
Cutting Data	Page 8.6							P1 general construction steel							
Ø d ₁	P _{mm}	L ₁	L ₂	d ₂											
M 4	0.5	63	10	2.8	2.1	3.5									
M 5	0.5	70	11	3.5	2.7	4.5									
M 6	0.5	80	13	4.5	3.4	5.5									
M 6	0.75	80	13	4.5	3.4	5.3									
M 8	0.75	80	14	6	4.9	7.3									
M 10	0.75	90	18	7	5.5	9.3									
M 8	1	90	17	6	4.9	7.0									
M 10	1	90	18	7	5.5	9.0									
M 12	1	100	18	9	7	11.0									
M 14	1	100	18	11	9	13.0									
M 16	1	100	18	12	9	15.0									
M 18	1	110	20	14	11	17.0									
M 20	1	125	20	16	12	19.0									

Continuation »

Cutting Data

[illegible]

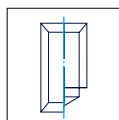
Machine Taps

DIN 374 HSS-E

straight flutes
for general construction steel

Group 5000
for blind and through holes

STEEL

 $2x d_1$ 

Cutting Data



Art.-No.

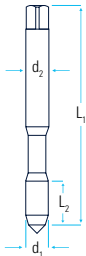
Technology  Page 8.1

Chamfer Length  Page 8.4

Surface  Page 8.2

Tolerance  Page 8.5

Cutting Data  Page 8.6



50000

C / 2-3 x P

bright

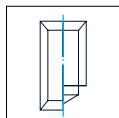
ISO2 (6H)

P1 general construction steel

$\varnothing d_1$	P_{mm}	L_1	L_2	d_2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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Continuation »

Cutting Data

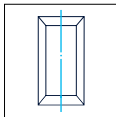
[illegible]

Machine Taps

DIN 374 HSS-E

Spiral point
for general construction steel

Group 5100
for through holes



2xd₁

Cutting Data



High Speed Cutting
by Schumacher

Art.-No.

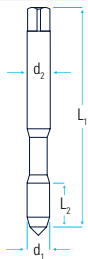
Technology Page 8.1

Chamfer Length Page 8.4

Surface Page 8.2

Tolerance Page 8.5

Cutting Data Page 8.6



51000	51000/25
High Volume	High Volume
B / 3,5-5 x P	
bright	TiN
ISO2 (6H)	ISO2 (6H)
P1 general construction steel	K2+K3 spheroidal and malleable cast iron

Ø d ₁	P _{mm}	L ₁	L ₂	d ₂								
M 4	0.5	63	10	2.8	2.1	3.5		■				
M 5	0.5	70	11	3.5	2.7	4.5		■				
M 6	0.5	80	13	4.5	3.4	5.5		■				
M 6	0.75	80	13	4.5	3.4	5.2		■				
M 8	0.75	80	14	6	4.9	7.3		■				
M 10	0.75	90	18	7	5.5	9.3		■				
M 8	1	90	17	6	4.9	7.0		■		■		
M 10	1	90	18	7	5.5	9.0		■		■		
M 12	1	100	18	9	7	11.0		■		■		
M 14	1	100	18	11	9	13.0		■		■		
M 16	1	100	18	12	9	15.0		■				
M 18	1	110	20	14	11	17.0		■				

Continuation »

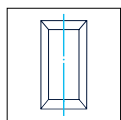
Machine Taps

DIN 374 HSS-E

Spiral point
for general construction steel

Group 5100
for through holes

STEEL

2x d₁

High Speed Cutting
by Schumacher

Cutting Data



Art.-No.

Technology Page 8.1

Chamfer Length Page 8.4

Surface Page 8.2

Tolerance Page 8.5

Cutting Data Page 8.6



51000

High Volume

51000/25

High Volume

B / 3,5-5 x P

bright

TiN

ISO2 (6H)

ISO2 (6H)

P1 general construction steel K2+K3 spheroidal and malleable cast iron

Ø d ₁	P _{mm}	L ₁	L ₂	d ₂		
M 20	1	125	20	16	12	19.0
M 22	1	125	20	18	14.5	21.0
M 24	1	140	20	18	14.5	23.0
M 10	1.25	100	22	7	5.5	8.8
M 12	1.25	100	22	9	7	10.8
M 14	1.25	100	22	11	9	12.8
M 12	1.5	100	22	9	7	10.5
M 14	1.5	100	22	11	9	12.5
M 16	1.5	100	22	12	9	14.5
M 18	1.5	110	25	14	11	16.5
M 20	1.5	125	25	16	12	18.5
M 22	1.5	125	25	18	14.5	20.5
M 24	1.5	140	25	18	14.5	22.5

Continuation »



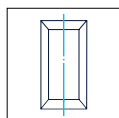
Machine Taps

DIN 374 HSS-E

Spiral point
for general construction steel

Group 5100
for through holes

STEEL

2xd₁

High Speed Cutting
by Schumacher

Art.-No.

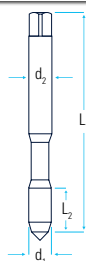
Technology Page 8.1

Chamfer Length Page 8.4

Surface Page 8.2

Tolerance Page 8.5

Cutting Data Page 8.6



51000

High Volume

51000/25

High Volume

B / 3,5-5 x P

bright

TiN

ISO2 (6H)

ISO2 (6H)

P1 general construction steel K2+K3 spheroidal and malleable cast iron

Ø d ₁	P _{mm}	L ₁	L ₂	d ₂						
M 26	1.5	140	28	18	14.5	24.5	■			
M 28	1.5	140	28	20	16	26.5	■			
M 30	1.5	150	30	22	18	28.5	■			
M 32	1.5	150	30	22	18	30.5	■			
M 34	1.5	170	33	28	22	32.5	■			
M 36	1.5	170	33	28	22	34.5	■			
M 38	1.5	170	33	28	22	36.5	■			
M 40	1.5	170	33	32	24	38.5	■			
M 42	1.5	170	33	32	24	40.5	■			
M 45	1.5	180	33	36	29	43.5	■			
M 48	1.5	190	36	36	29	46.5	■			
M 18	2	125	26	14	11	16.0	■			
M 20	2	140	27	16	12	18.0	■			
M 22	2	140	27	18	14.5	20.0	■			

Continuation »

Cutting Data

High Volume 

bright

ISO2 (6H)

P1 general construction steel K2+K3 spheroidal and malleable cast iron

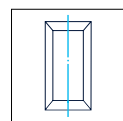
[illegible]

Machine Taps Blue Ring

DIN 374 HSS-E

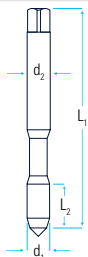
Spiral point
for chemical resistant steel

Group 5120
for through holes

 $2x d_1$ 

Cutting Data



Art.-No.							51200		51200/25					
Technology							i		Page 8.1		Blue Ring		Blue Ring	
Chamfer Length							i		Page 8.4		B / 3,5-5 x P			
Surface							i		Page 8.2		bright		TiN	
Tolerance							i		Page 8.5		ISO2 (6H)		ISO2 (6H)	
Cutting Data							i		Page 8.6		P2 high strength steel		M1 chemical resistant steel	
Ø d ₁	P _{mm}	L ₁	L ₂	d ₂										
M 5	0.5	70	11	3.5	2.7	4.5								
M 6	0.5	80	13	4.5	3.4	5.5								
M 6	0.75	80	13	4.5	3.4	5.3								
M 8	1	90	17	6	4.9	7.0								
M 10	1	90	18	7	5.5	9.0								
M 12	1	100	18	9	7	11.0								
M 14	1	100	18	11	9	13.0								
M 10	1.25	100	22	7	5.5	8.8								
M 12	1.25	100	22	9	7	10.8								
M 12	1.5	100	22	9	7	10.5								
M 14	1.5	100	22	11	9	12.5								
M 16	1.5	100	22	12	9	14.5								
M 18	1.5	110	25	14	11	16.5								
M 20	1.5	125	25	16	12	18.5								
M 22	1.5	125	25	18	14.5	20.5								
M 24	1.5	140	27	18	14.5	22.5								

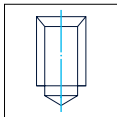
Machine Taps Blue Ring

DIN 374 HSS-E

RH spiral flutes 40°
for chemical resistant steel

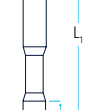
Group 5350
for blind holes

INOX
Stainless

 $2x d_1$ 

Cutting Data



Art.-No.							53500		53500/25						
Technology		Page 8.1						Blue Ring		Blue Ring					
Chamfer Length		Page 8.4						C / 2-3 x P							
Surface		Page 8.2						bright		TiN					
Tolerance		Page 8.5						ISO2 (6H)		ISO2 (6H)					
Cutting Data		Page 8.6						P2 high strength steel		M1 chemical resistant steel					
															
Ø d ₁	P _{mm}	L ₁	L ₂	d ₂											
M 5	0.5	70	5	3.5	2.7	4.5									
M 6	0.5	80	5	4.5	3.4	5.5									
M 6	0.75	80	8	4.5	3.4	5.2									
M 8	1	90	10	6	4.9	7.0									
M 10	1	90	10	7	5.5	9.0									
M 12	1	100	11	9	7	11.0									
M 14	1	100	11	11	9	13.0									
M 10	1.25	100	16	7	5.5	8.8									
M 12	1.25	100	15	9	7	10.8									
M 12	1.5	100	15	9	7	10.5									
M 14	1.5	100	15	11	9	12.5									
M 16	1.5	100	15	12	9	14.5									
M 18	1.5	110	17	14	11	16.5									
M 20	1.5	125	17	16	12	18.5									
M 22	1.5	125	17	18	14.5	20.5									
M 24	1.5	140	20	18	14.5	22.5									

■ available – intermediate size on request

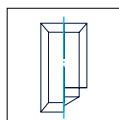
Set of Taps

DIN 2181 HSS-E

set of 2 pieces, straight flutes
for general construction steel

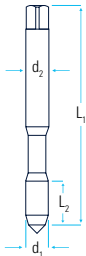
Group 1200
for blind and through holes

STEEL

 $2x d_1$ 

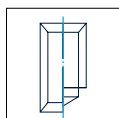
Cutting Data



Art.-No.							12100		12200	
Technology							i		Page 8.1	
Chamfer Length							i		Page 8.4	
Surface							i		Page 8.2	
Tolerance							i		Page 8.5	
Cutting Data							i		Page 8.6	
							D / 3,5-5 x P		C / 2-3 x P	
							bright		bright	
							Nr. 1		Nr. 2 = ISO2 (6H)	
							P1 general construction steel		K2+K3 spheroidal and malleable cast iron	
Ø d ₁	P _{mm}	L ₁	L ₂	d ₂						
M 6	0.5	56	13	6	4.9	5.5	■		■	
M 6	0.75	56	14	6	4.9	5.3	■		■	
M 8	0.75	63	14	6	4.9	7.3	■		■	
M 10	0.75	63	18	7	5.5	9.3	■		■	
M 8	1	63	17	6	4.9	7.0	■		■	
M 10	1	63	18	7	5.5	9.0	■		■	
M 12	1	70	18	9	7	11.0	■		■	
M 14	1	70	18	11	9	13.0	■		■	
M 16	1	70	20	12	9	15.0	■		■	
M 18	1	80	18	14	11	17.0	■		■	
M 20	1	80	18	16	12	19.0	■		■	
M 10	1.25	70	22	7	5.5	8.8	■		■	
M 12	1.25	70	20	9	7	10.8	■		■	
M 14	1.25	70	20	11	9	12.8	■		■	

Continuation »

Cutting Data



Art.-No.

Technology

Chamfer Length

Surface

Tolerance

Cutting Data

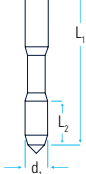
Page 8.1

Page 8.4

Page 8.2

Page 8.5

Page 8.6



12100

12200

D / 3,5-5 x P

C / 2-3 x P

bright

bright

Nr. 1

Nr. 2 = ISO2 (6H)

P1 general construction steel

K2+K3 spheroidal and malleable cast iron

Ø d ₁	P _{mm}	L ₁	L ₂	d ₂				
M 12	1.5	70	20	9	7	10.5		
M 14	1.5	70	20	11	9	12.5		
M 16	1.5	70	20	12	9	14.5		
M 18	1.5	80	22	14	11	16.5		
M 20	1.5	80	22	16	12	18.5		
M 22	1.5	80	22	18	14.5	20.5		
M 24	1.5	90	22	18	14.5	22.5		
M 25	1.5	90	22	18	14.5	23.5		
M 26	1.5	90	22	18	14.5	24.5		
M 27	1.5	90	22	20	16	25.5		
M 28	1.5	90	22	20	16	26.5		
M 30	1.5	90	22	22	18	28.5		
M 32	1.5	90	25	22	18	30.5		
M 33	1.5	100	25	25	20	31.5		
M 34	1.5	100	25	28	22	32.5		

Continuation »

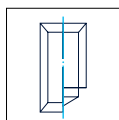
Set of Taps

DIN 2181 HSS-E

set of 2 pieces, straight flutes
for general construction steel

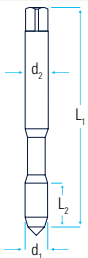
Group 1200
for blind and through holes

STEEL

 $2x d_1$ 

Cutting Data



Art.-No.							12100		12200	
Technology	 Page 8.1									
Chamfer Length	 Page 8.4									
Surface	 Page 8.2									
Tolerance	 Page 8.5									
Cutting Data	 Page 8.6									
							D / 3,5-5 x P		C / 2-3 x P	
							bright		bright	
							Nr. 1		Nr. 2 = ISO2 (6H)	
							P1 general construction steel		K2+K3 spheroidal and malleable cast iron	
Ø d ₁	P _{mm}	L ₁	L ₂	d ₂						
M 35	1.5	100	25	28	22	33.5				
M 36	1.5	100	25	28	22	34.5				
M 18	2	80	22	14	11	16.0				
M 20	2	80	22	16	12	18.0				
M 22	2	80	22	18	14.5	20.0				
M 24	2	90	22	18	14.5	22.0				
M 27	2	90	22	20	16	25.0				
M 30	2	90	22	22	18	28.0				
M 36	3	125	36	28	22	33.0				
M 39	3	125	36	32	24	36.0				
M 42	3	125	36	32	24	39.0				
M 45	3	125	36	36	29	42.0				
M 48	3	140	36	36	29	45.0				

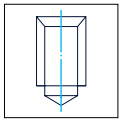
Carbide Machine Taps

DIN 374 Solid Carbide

straight flutes
for hard materials

Group G580
for blind holes

HARD

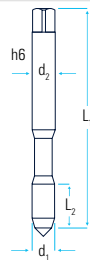
 $2x d_1$ 

Cutting Data



VHM tec
CARBIDE by Schumacher

Art.-No.

Technology Page 8.1Champfer Length Page 8.4Surface Page 8.2Tolerance  Page 8.5Cutting Data Page 8.6

G5800/40

Internal coolant

C / 2-3 x P

bright

6HX

K1 grey cast iron N3 copper alloys H1 hard materials

[illegible]

■ available – intermediate size on request



High Speed Cutting 
by Schumacher

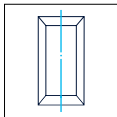


Machine Taps Blue Ring

DIN 5156 HSS-E

Spiral point
for chemical resistant steel

Group 5620
for through holes



2xd₁



Cutting Data



Art.-No.

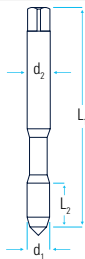
Technology Page 8.1

Chamfer Length Page 8.4

Surface Page 8.2

Tolerance Page 8.5

Cutting Data Page 8.6



56200

56200/25

Blue Ring

Blue Ring

B / 3,5-5 x P

bright

TiN

P2 high strength steel M1 chemical resistant steel

Ø d₁

P

L₁

L₂

d₂

G 1/8"

28

90

20

7

5.5

8.8

■

■

G 1/4"

19

100

22

11

9

11.8

■

■

G 3/8"

19

100

22

12

9

15.3

■

■

G 1/2"

14

125

25

16

12

19.0

■

■

G 5/8"

14

125

25

18

14.5

21.0

G 3/4"

14

140

28

20

16

24.5

■

■

G 7/8"

14

150

28

22

18

28.3

G 1"

11

160

30

25

20

30.8

■

■

G 1 1/4"

11

170

30

32

24

39.5

G 1 1/2"

11

190

32

36

29

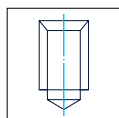
45.3

Cutting Data



for general construction steel

STEEL

 $2x d_1$ 

High Speed Cutting  Post: September 2008

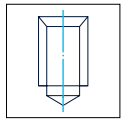


P1 general construction steel K2+K3 spheroidal and malleable cast iron

[illegible]

Cutting Data

UNI

[illegible]

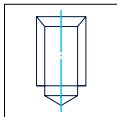
Machine Taps Blue Ring

DIN 5156 HSS-E

RH spiral flutes 40°
for chemical resistant steel

Group 5850
for blind holes

INOX
Stainless

 $2x d_1$ 

Cutting Data

[illegible]

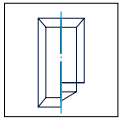
Short Machine Taps

DIN 5157 HSS-E

straight flutes
for copper alloys

Group 1350
for blind and through holes

MS

 $2x d_1$ 

Cutting Data



Art.-No.

TechnologyPage 8.1

Chamfer LengthPage 8.4

SurfacePage 8.2

TolerancePage 8.5

Cutting DataPage 8.6

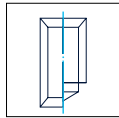
Short Machine Taps

DIN 5157 HSS-E

straight flutes
for cast iron

Group 1360
for blind and through holes

CAST
IRON

 $2x d_1$ 

Cutting Data

[illegible]

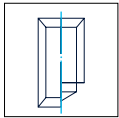
Machine Taps

DIN 376 HSS-E

straight flutes
for general construction steel

Group 4400
for blind and through holes

STEEL

 $2x d_1$ 

Cutting Data

[illegible]

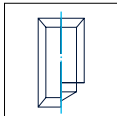
Machine Taps White Ring

DIN 371 HSS-E

straight flutes
for cast iron

Group 3430
for blind and through holes

CAST
IRON

 $2x d_1$ 

Cutting Data

[illegible]

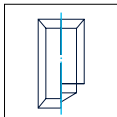
Machine Taps White Ring

DIN 376 HSS-E

straight flutes
for cast iron

Group 4430
for blind and through holes

CAST
IRON



2x d₁



Cutting Data



Art.-No.

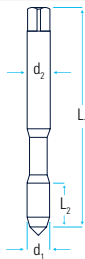
Technology Page 8.1

Chamfer Length Page 8.4

Surface Page 8.2

Tolerance Page 8.5

Cutting Data Page 8.6



44300/01

White Ring

C / 2-3 x P

nitrided

2 B

K1 grey cast iron N7 duroplastics

Ø d ₁	P	L ₁	L ₂	d ₂		
7/16"	14	100	22	8	6.2	9.4
1/2"	13	110	25	9	7	10.8
9/16"	12	110	26	11	9	12.2
5/8"	11	110	27	12	9	13.6
3/4"	10	125	30	14	11	16.5
7/8"	9	140	32	18	14.5	19.5
1"	8	160	36	18	14.5	22.3



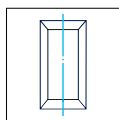
Machine Taps

DIN 371 HSS-E

Spiral point
for general construction steel

Group 3450
for through holes

STEEL

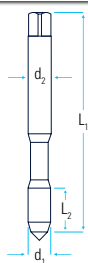
 $2x d_1$ 

High Speed Cutting
by Schumacher

Cutting Data



Art.-No.

Technology  Page 8.1Champfer Length Page 8.4Surface Page 8.2Tolerance Page 8.5Cutting Data  Page 8.6

34500	34500/25
High Volume 	High Volume 
B / 3,5-5 x P	
bright	TiN
2 B	2 B
P1 general construction steel	K2+K3 spheroidal and malleable cast iron

[illegible]

■ available – intermediate size on request

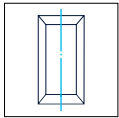
Machine Taps

DIN 376 HSS-E

Spiral point
for general construction steel

Group 4450
for through holes

STEEL

 $2x d_1$ 

High Speed Cutting  by Seibacher

Cutting Data

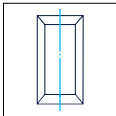
[illegible]

Machine Taps Blue Ring

DIN 371 HSS-E

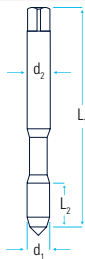
Spiral point
for chemical resistant steel

Group 3460
for through holes



2xd₁

Cutting Data



Art.-No.

Technology Page 8.1

Chamfer Length Page 8.4

Surface Page 8.2

Tolerance Page 8.5

Cutting Data Page 8.6

34600/26

34600/25

Blue Ring

Blue Ring

B / 3,5-5 x P

VAP

TiN

2 B

2 B

P2 high strength steel M1 chemical resistant steel

Ø d ₁	P	L ₁	L ₂	d ₂		
Nr. 4	40	56	11	3.5	2.7	2.35
Nr. 5	40	56	11	3.5	2.7	2.65
Nr. 6	32	56	12	4	3	2.85
Nr. 8	32	63	13	4.5	3.4	3.5
Nr. 10	24	70	15	6	4.9	3.9
Nr. 12	24	80	17	6	4.9	4.5
1/4"	20	80	17	7	5.5	5.2
5/16"	18	90	20	8	6.2	6.6
3/8"	16	100	22	9	7	8.0

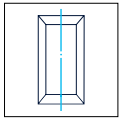
Machine Taps Blue Ring

DIN 376 HSS-E

Spiral point
for chemical resistant steel

Group 4460
for through holes

INOX
Stainless

 $2x d_1$ 

Cutting Data

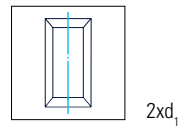
[illegible]

Machine Taps Black Ring

DIN 376 HSS-E

Spiral point
for universal use

Group 3490
for through holes



Cutting Data

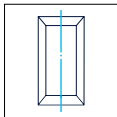
[illegible]

Machine Taps Black Ring

DIN 376 HSS-E

Spiral point
for universal use

Group 4490
for through holes



2xd₁



Cutting Data



Art.-No.

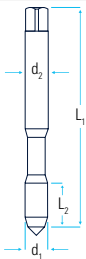
Technology Page 8.1

Chamfer Length Page 8.4

Surface Page 8.2

Tolerance Page 8.5

Cutting Data Page 8.6



44900/26

Black Ring

B / 3,5-5 x P

VAP

2 B

P1 general construction steel M1 chemical resistant steel N1 Aluminium N3 copper alloys

Ø d ₁	P _{mm}	L ₁	L ₂	d ₂		
7/16"	14	100	22	8	6.2	9.4
1/2"	13	110	25	9	7	10.8
9/16"	12	110	26	11	9	12.2
5/8"	11	110	27	12	9	13.6
3/4"	10	125	30	14	11	16.5
7/8"	9	140	32	18	14.5	19.5
1"	8	160	36	18	14.5	22.3



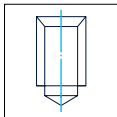
■ available – intermediate size on request

Machine Taps Red Ring

DIN 371 HSS-E PM

RH spiral flutes 20°
for nickel alloys

Group 3480
for blind holes



2xd₁



Cutting Data



Art.-No.

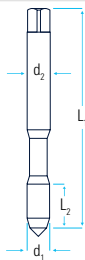
Technology Page 8.1

Chamfer Length Page 8.4

Surface Page 8.2

Tolerance Page 8.5

Cutting Data Page 8.6



34800

PM-Line

Red Ring

3-4 x P

bright

2 B

P2 high strength steel S1 titanium alloys S2 nickel alloys

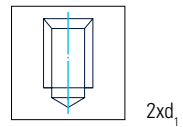
Ø d ₁	P	L ₁	L ₂	d ₂		
Nr. 4	40	56	11	3.5	2.7	2.35
Nr. 5	40	56	11	3.5	2.7	2.65
Nr. 6	32	56	12	4	3	2.85
Nr. 8	32	63	13	4.5	3.4	3.5
Nr. 10	24	70	15	6	4.9	3.9
Nr. 12	24	80	17	6	4.9	4.5
1/4"	20	80	17	7	5.5	5.2
5/16"	18	90	20	8	6.2	6.6
3/8"	16	100	22	9	7	8.0

Machine Taps Red Ring

DIN 371 HSS-E PM

RH spiral flutes 20°
for nickel alloys

Group 4480
for blind holes



Cutting Data

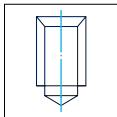
[illegible]

Machine Taps Blue Ring

DIN 371 HSS-E

RH spiral flutes 40°
for chemical resistant steel

Group 3530
for blind holes



2xd₁

Cutting Data



Art.-No.

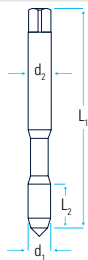
Technology Page 8.1

Chamfer Length Page 8.4

Surface Page 8.2

Tolerance Page 8.5

Cutting Data Page 8.6



35300/26

35300/25

Blue Ring

Blue Ring

C / 2-3 x P

VAP

TiN

2 B

2 B

P2 high strength steel M1 chemical resistant steel

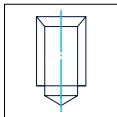
Ø d ₁	P	L ₁	L ₂	d ₂		
Nr. 4	40	56	6	3.5	2.7	2.35
Nr. 5	40	56	7	3.5	2.7	2.65
Nr. 6	32	56	7	4	3	2.85
Nr. 8	32	63	8	4.5	3.4	3.5
Nr. 10	24	70	10	6	4.9	3.9
Nr. 12	24	80	10	6	4.9	4.5
1/4"	20	80	13	7	5.5	5.2
5/16"	18	90	14	8	6.2	6.6
3/8"	16	100	16	9	7	8.0

Machine Taps Black Ring

DIN 371 HSS-E

RH spiral flutes 40°
for universal use

Group 3590
for blind holes



2xd₁



Cutting Data



Art.-No.

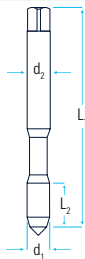
Technology Page 8.1

Chamfer Length Page 8.4

Surface Page 8.2

Tolerance Page 8.5

Cutting Data Page 8.6



35900/26

Black Ring

C / 2-3 x P

VAP

2 B

P1 general construction steel M1 chemical resistant steel N1 Aluminium N3 copper alloys

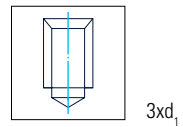
Ø d ₁	P _{mm}	L ₁	L ₂	d ₂		
Nr. 4	40	56	6	3.5	2.7	2.35
Nr. 5	40	56	7	3.5	2.7	2.65
Nr. 6	32	56	7	4	3	2.85
Nr. 8	32	63	8	4.5	3.4	3.5
Nr. 10	24	70	10	6	4.9	3.9
Nr. 12	24	80	10	6	4.9	4.5
1/4"	20	80	13	7	5.5	5.2
5/16"	18	90	14	8	6.2	6.6
3/8"	16	100	16	9	7	8.0

Machine Taps Black Ring

DIN 371 HSS-E

RH spiral flutes 40°
for universal use

Group 4590
for blind holes



Cutting Data

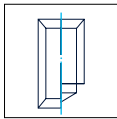
[illegible]

Forming Taps

DIN 371 HSS-E

straight oil grooves for steel, non-ferrous steel
and heat treatable steel

Group 3560
for blind and through holes



2xd₁



High Speed Cutting
by Schumacher

Cutting Data



Art.-No.

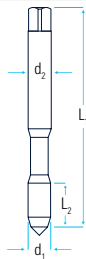
Technology Page 8.1

Chamfer Length Page 8.4

Surface Page 8.2

Tolerance Page 8.5

Cutting Data Page 8.6



35600/53

High Volume

35600/2553

High Volume

C / 2-3 x P

bright

TiN

2 BX

2 BX

P1 general construction steel P2 high strength steel N3 copper alloys

Ø d ₁	P	L ₁	L ₂	d ₂		
Nr. 4	40	56	11	3.5	2.7	2.55
Nr. 5	40	56	11	3.5	2.7	2.9
Nr. 6	32	56	12	4	3	3.15
Nr. 8	32	63	13	4.5	3.4	3.8
Nr. 10	24	70	15	6	4.9	4.35
Nr. 12	24	80	17	6	4.9	4.95
1/4"	20	80	17	7	5.5	5.8
5/16"	18	90	20	8	6.2	7.3
3/8"	16	100	22	9	7	8.8

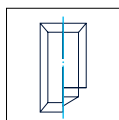
Set of Taps

DIN 351 HSS-E

set of 3 pieces, straight flutes
for general construction steel

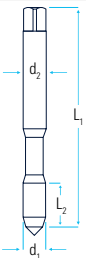
Group 1500
for blind and through holes

STEEL

 $2x d_1$ 

Cutting Data



Art.-No.							15100		15200		15300	
Technology		 Page 8.1										
Chamfer Length		 Page 8.4										
Surface		 Page 8.2										
Tolerance		 Page 8.5										
Cutting Data		 Page 8.6										
							D / 3,5-5 x P		3-4 x P		C / 2-3 x P	
							bright		bright		bright	
							Nr. 1		Nr. 2		Nr. 3 = 2 B	
							P1 general construction steel		K2+K3 spheroidal and malleable cast iron			
Ø d ₁	P	L ₁	L ₂	d ₂								
Nr. 4	40	40	12	3.5	2.7	2.3						
Nr. 5	40	40	12	3.5	2.7	2.6						
Nr. 6	32	45	14	4	3	2.8						
Nr. 8	32	45	14	4.5	3.4	3.5						
Nr. 10	24	50	16	6	4.9	3.9						
Nr. 12	24	50	16	6	4.9	4.5						
1/4"	20	50	18	6	4.9	5.2						
5/16"	18	56	18	6	4.9	6.6						
3/8"	16	70	23	7	5.5	8.0						
7/16"	14	70	25	8	6.2	9.4						
1/2"	13	75	28	9	7	10.8						
9/16"	12	80	30	11	9	12.2						
5/8"	11	80	30	12	9	13.6						
3/4"	10	95	35	14	11	16.5						
7/8"	9	110	38	18	14.5	19.5						
1"	8	110	38	20	16	22.3						

■ available – intermediate size on request

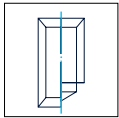
Machine Taps

DIN 371 HSS-E

straight flutes
for general construction steel

Group 3600
for blind and through holes

STEEL

 $2x d_1$ 

Cutting Data

[illegible]

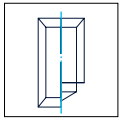
Machine Taps

DIN 374 HSS-E

straight flutes
for general construction steel

Group 4600
for blind and through holes

STEEL

 $2x d_1$ 

Cutting Data

[illegible]

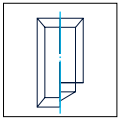
Machine Taps White Ring

DIN 371 HSS-E

straight flutes
for cast iron

Group 3630
for blind and through holes

CAST
IRON

 $2x d_1$ 

Cutting Data

[illegible]

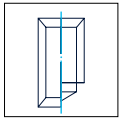
Machine Taps White Ring

DIN 374 HSS-E

straight flutes
for cast iron

Group 4630
for blind and through holes

CAST
IRON

 $2x d_1$ 

Cutting Data

[illegible]

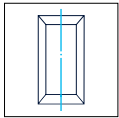
Machine Taps

DIN 371 HSS-E

Spiral point
for general construction steel

Group 3650
for through holes

STEEL

 $2x d_1$ 

High Speed Cutting

Cutting Data

[illegible]

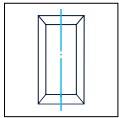
Machine Taps

DIN 374 HSS-E

Spiral point
for general construction steel

Group 4650
for through holes

STEEL

 $2x d_1$ 

High Speed Cutting 
by Schumacher

Cutting Data

[illegible]

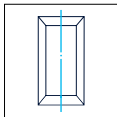
■ available – intermediate size on request

Machine Taps Blue Ring

DIN 371 HSS-E

Spiral point
for chemical resistant steel

Group 3660
for through holes



2xd₁

Cutting Data



Art.-No.

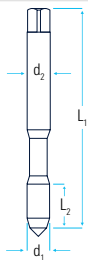
Technology Page 8.1

Chamfer Length Page 8.4

Surface Page 8.2

Tolerance Page 8.5

Cutting Data Page 8.6



36600

36600/25

Blue Ring

Blue Ring

B / 3,5-5 x P

bright

TiN

2 B

2 B

P2 high strength steel M1 chemical resistant steel

Ø d₁

P

L₁

L₂

d₂

□

Nr. 5

44

56

11

3.5

2.7

2.7

Nr. 6

40

56

12

4

3

3.0

Nr. 8

36

63

13

4.5

3.4

3.5

Nr. 10

32

70

15

6

4.9

4.1

Nr. 12

28

80

17

6

4.9

4.7

1/4"

28

80

17

7

5.5

5.5

5/16"

24

90

18

8

6.2

6.9

3/8"

24

100

18

9

7

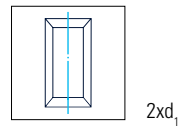
8.5

Machine Taps Black Ring

DIN 371 HSS-E

Spiral point
for universal use

Group 3690
for through holes



Cutting Data

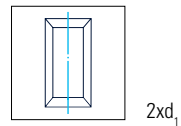
[illegible]

Machine Taps Black Ring

DIN 374 HSS-E

Spiral point
for universal use

Group 4690
for through holes



Cutting Data

[illegible]

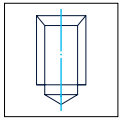
Machine Taps Red Ring

DIN 371 HSS-E PM

RH spiral flutes 20°
for nickel alloys

Group 3680
for blind holes

HIGH
STRENGTH

 $2x d_1$ 

Cutting Data

[illegible]

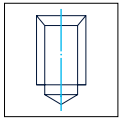
Machine Taps

DIN 371 HSS-E

RH spiral flutes 40°
for general construction steel

Group 3720
for blind holes

STEEL

 $2x d_1$ 

High Speed Cutting 

Cutting Data

[illegible]

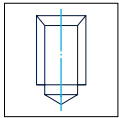
Machine Taps

DIN 374 HSS-E

RH spiral flutes 40°
for general construction steel

Group 4720
for blind holes

STEEL

 $2x d_1$ 

High Speed Cutting
für Schumacher

Cutting Data

[illegible]

■ available – intermediate size on request

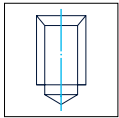
Machine Taps Blue Ring

DIN 371 HSS-E

RH spiral flutes 40°
for chemical resistant steel

Group 3730
for blind holes

INOX
Stainless

 $2x d_1$ 

Cutting Data

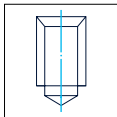
[illegible]

Machine Taps Blue Ring

DIN 374 HSS-E

RH spiral flutes 40°
for chemical resistant steel

Group 4730
for blind holes



2xd₁

Cutting Data



Art.-No.

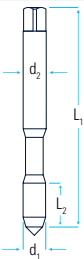
Technology Page 8.1

Chamfer Length Page 8.4

Surface Page 8.2

Tolerance Page 8.5

Cutting Data Page 8.6



47300

47300/25

Blue.Ring

Blue Ring

C / 2-3 x P

bright

TiN

2 B

2 B

P2 high strength steel M1 chemical resistant steel

Ø d₁

P

L₁

L₂

d₂

7/16"

20

100

13

8

6.2

9.9

1/2"

20

100

13

9

7

11.5

■

■

9/16"

18

100

15

11

9

12.9

5/8"

18

100

15

12

9

14.5

■

■

3/4"

16

110

17

14

11

17.5

■

■

7/8"

14

125

17

18

14.5

20.4

■

■

1"

12

140

20

18

14.5

23.3

■

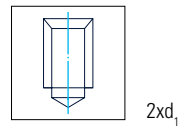
■

Machine Taps Black Ring

DIN 371 HSS-E

RH spiral flutes 40°
for universal use

Group 3790
for blind holes



Cutting Data

[illegible]

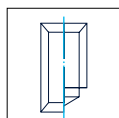
Set of Taps

DIN 2181 HSS-E

set of 2 pieces, straight flutes
for general construction steel

Group 1600
for blind and through holes

STEEL

 $2x d_1$ 

Cutting Data

[illegible]

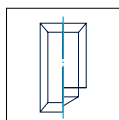
Machine Taps

DIN 40433 HSS-E

straight flutes
for general construction steel

Group 1830
for blind and through holes

STEEL

 $2x d_1$ 

Cutting Data

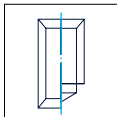
[illegible]

Set of Taps

DIN 40432 HSS-E

set of 2 pieces, straight flutes
for general construction steel

Group 1800
for blind and through holes



2xd₁



Art.-No.

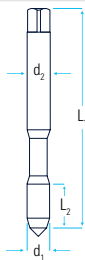
Technology Page 8.1

Chamfer Length Page 8.4

Surface Page 8.2

Tolerance Page 8.5

Cutting Data Page 8.6



18100

18200

D / 3,5-5 x P

C / 2-3 x P

bright

bright

Nr.1

Nr.2

P1 general construction steel K2+K3 spheroidal and malleable cast iron

Ø d ₁	P	L ₁	L ₂	d ₂		
Pg 7	20	70	20	9	7	11.4
Pg 9	18	70	20	12	9	14.0
Pg 11	18	80	22	14	11	17.4
Pg 13.5	18	80	22	16	12	19.2
Pg 16	18	80	22	18	14.5	21.3
Pg 21	16	90	22	22	18	27.0
Pg 29	16	100	25	28	22	35.6
Pg 36	16	140	25	36	29	45.6

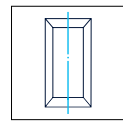


Single Finishing Machine Taps

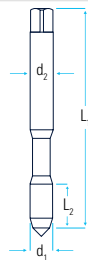
internal standard HSS-E

2-step design, RH thread - LH spiral flutes 6°

LH thread - RH spiral flutes 6°, for general construction steel

Group 6850
for through holes2x d₁

Art.-No.

Technology  Page 8.1Chamfer Length  Page 8.4Surface  Page 8.2Tolerance  Page 8.5Cutting Data  Page 8.6

Cutting Data

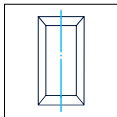


Ø d ₁	P _{mm}	L ₁	L ₂	d ₂						
Tr 10	2	110	65	7	5.5	8.2	■		■	
Tr 12	3	160	110	8	6.2	9.25	■		■	
Tr 14	3	160	110	10	8	11.25	■		■	
Tr 16	4	200	130	11	9	12.3	■		■	
Tr 18	4	200	130	12	9	14.3	■		■	
Tr 20	4	200	130	15	12	16.3	■		■	
Tr 22	5	240	155	16	12	17.3	■		■	
Tr 24	5	240	155	18	14.5	19.3	■		■	
Tr 26	5	260	165	20	16	21.3	■		■	
Tr 28	5	270	170	22	18	23.3	■		■	
Tr 30	6	290	190	22	18	24.3	■		■	
Tr 32	6	300	190	25	20	26.3	■		■	
Tr 36	6	320	200	28	22	30.3	■		■	
Tr 40	7	390	250	32	24	33.5	■		■	

Set of Taps

internal standard HSS-E
set of 3 pieces, LH spiral flutes 6°
for general construction steel

Group 6800
for through holes



Cutting Data



Art.-No.

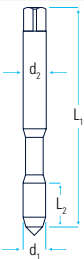
Technology Page 8.1

Chamfer Length Page 8.4

Surface Page 8.2

Tolerance Page 8.5

Cutting Data Page 8.6



68100

68200

68300

bright

bright

bright

Nr. 1

Nr. 2

Nr. 3 = 7H

P1 general construction steel K2+K3 spheroidal and malleable cast iron

Ø d₁

P_{mm}

L₁

L₂

d₂

Tr 10

2

90

35

7

5.5

8.2

■

■

■

Tr 12

3

110

45

8

6.2

9.25

■

■

■

Tr 14

3

130

45

10

8

11.25

■

■

■

Tr 16

4

140

55

11

9

12.3

■

■

■

Tr 18

4

150

55

12

9

14.3

■

■

■

Tr 20

4

160

55

15

12

16.3

■

■

■

Tr 22

5

180

70

16

12

17.3

■

■

■

Tr 24

5

190

70

18

14.5

19.3

■

■

■

Tr 26

5

210

70

20

16

21.3

■

■

■

Tr 28

5

220

70

22

18

23.3

■

■

■

Tr 30

6

240

85

22

18

24.3

■

■

■

Tr 32

6

255

85

25

20

26.3

■

■

■

Tr 36

6

280

85

28

22

30.3

■

■

■

Tr 40

7

310

100

32

24

33.5

■

■

■

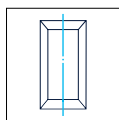
Set of Taps

internal standard HSS-E

set of 3 pieces, RH spiral flutes 6°
for general construction steel

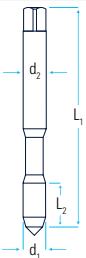
Group 6800 LH
for through holes

STEEL

 $2x d_1$ 

Cutting Data



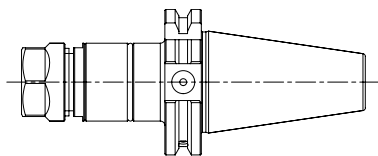
Art.-No.							68105			68205			68305		
Technology	 Page 8.1						LH			LH			LH		
Chamfer Length	 Page 8.4						bright			bright			bright		
Surface	 Page 8.2						Nr. 1			Nr. 2			Nr. 3 = 7H		
Tolerance	 Page 8.5						P1 general construction steel								
Cutting Data	 Page 8.6						K2+K3 spheroidal and malleable cast iron								
Ø d ₁	P _{mm}	L ₁	L ₂	d ₂											
Tr 10	2	90	35	7	5.5	8.2									
Tr 12	3	110	45	8	6.2	9.25									
Tr 14	3	130	45	10	8	11.25									
Tr 16	4	140	55	11	9	12.3									
Tr 18	4	150	55	12	9	14.3									
Tr 20	4	160	55	15	12	16.3									
Tr 22	5	180	70	16	12	17.3									
Tr 24	5	190	70	18	14.5	19.3									
Tr 26	5	210	70	20	16	21.3									
Tr 28	5	220	70	22	18	23.3									
Tr 30	6	240	85	22	18	24.3									
Tr 32	6	255	85	25	20	26.3									
Tr 36	6	280	85	28	22	30.3									
Tr 40	7	310	100	32	24	33.5									

SCHUMACHER
PRECISION TOOLS SINCE 1918

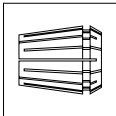
Developed by:

ToolDesign 
by Schumacher

CATALOGUE NO. 125 S - THREADING TECHNOLOGY



Edition
Tap Holder
New product development



Supporting Digital Production

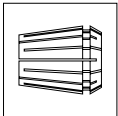
[illegible]

DIN 69893 HSK-A

[illegible][illegible]

DIN 1835 B + E

minimum length compensation

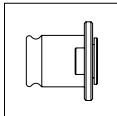


Supporting Digital Production

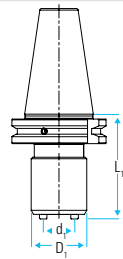
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DIN 69871 AD/B

minimum length compensation



NUMERIC
Supporting Digital Production

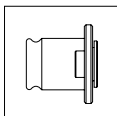
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Tap Holder - NUMERIC

DIN 69893 HSK-A

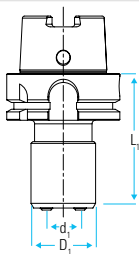
Group S4200
for machines with synchronous spindle

minimum length compensation



NUMERIC
Supporting Digital Production

Art-No.
Technology
Tool Adaptation
Shank Types
Cooling & Lubrication

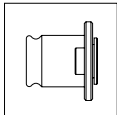


S4200
NUMERIC
Quick Change Adapter
Hollow taper shanks
—

HSK-Size	Taps	Ø d ₁	Ø D ₁	L ₁	$\zeta \sqrt{\frac{L}{E}}$	Size	Dimension	Availability
32	M 3 - M 12	19	36	75	0.4 0.2	1	75/36	■
50	M 3 - M 12	19	36	72	0.4 0.2	1	72/36	■
	M 8 - M 20	31	53	91	0.4 0.2	2	91/53	■
63	M 3 - M 12	19	36	75	0.4 0.2	1	75/36	■
	M 3 - M 12	19	36	80	0.4 0.2	1	80/36	■
	M 3 - M 12	19	36	120	0.4 0.2	1	120/36	■
	M 3 - M 12	19	36	152	0.4 0.2	1	152/36	■
	M 3 - M 12	19	36	180	0.4 0.2	1	180/36	■
	M 8 - M 20	31	53	89	0.4 0.2	2	89/53	■
	M 14 - M 33	48	78	121	0.4 0.2	3	121/78	■
100	M 3 - M 12	19	36	75	0.4 0.2	1	75/36	■
	M 3 - M 12	19	36	160	0.4 0.2	1	160/36	■
	M 8 - M 20	31	53	94	0.4 0.2	2	94/53	■
	M 8 - M 20	31	53	160	0.4 0.2	2	160/53	■
	M 14 - M 33	48	78	127	0.4 0.2	3	127/78	■
	M 14 - M 33	48	78	160	0.4 0.2	3	160/78	■

DIN 1835 B

minimum length compensation



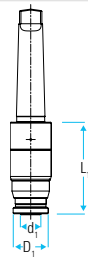
NUMERIC
Supporting Digital Production

[illegible]

DIN 69893 HSK-A

[illegible]

DIN 228 B

[illegible]

Color Ring Series

The color ring line comprises machine taps from five different product groups which meet the requirements of highly sophisticated industries such as automotive, aerospace or chemicals. By their color marking, the appropriate use of these taps is facilitated. Selected hard material coatings increase the range of employment.



White Ring

Product line for grey cast iron



Red Ring

Product line for high strength heat treatable steel and nickel alloys



Blue Ring

Product line for use in INOX/stainless steel



Black Ring

Product line for general purpose »Black Power«



Yellow Ring

Product line for use in titanium alloys



Coatings

Technologies for hard material coatings of HSS and solid carbide tools are increasingly important since they bring about advantages such as:

- › an increase in tool life
- › a reduction of set-up times

and a substantial

- › increase of working speeds

These factors justify the extra expenditures compared to tools without hard material coatings.

TiN Coating

Allround coating designed to improve tool life and optimize cutting speed. With a surface hardness of 2600 HV 0.05 and a frictional coefficient of 0.40 this coating can be applied in working temperatures of up to 450°C. The thickness of the layer ranges between 2 - 4 µm. TiN coatings have a internal compressive stress of approx. 3.1 GPa.



TiCN Coating

Improved tribological characteristics compared to TiN. Micro hardness at 3000 HV 0.05; frictional coefficient reduced to 0.35 compared to steel. Temperature stability of TiCN layers (thickness of 2 - 4 µm) extends up to 350°C. Internal compressive stress is at 3.5 GPa.



TiAlN Coating

Optimized PVD layer system, for hard materials of up to 50 HRC. Enhanced range of employment due to temperature stability up to 800°C and micro hardness of 3000 HV 0,05. This layer system features an oxidizing protection layer which provides the tool with a 'renewal effect.' Internal compressive stress of 1.9 GPa. The coating system is applied with a layer thickness of 2-4 µm.



SG4 Coating

Special coating made of super hard coating layer and solid state lubrication layer. Sectors of use comprise dry cutting and minimum lubrication. Wide range of applications due to optimum friction results and reduced tendency of adhesion.



CrN Coating

PVD layer system for non-ferrous materials and thermoplastics. It can be applied in working temperatures up to 600°C and has a low frictional coefficient of 0.3 compared to steel. The layer system has a thickness of 6 µm and a micro hardness of 1750 HV 0.05.



DLC Coating

The diamond like carbon layer is the best solution for non-ferrous materials. The high surface hardness of 5000 HV 0,05 is combined with a very low friction coefficient of 0.1 compared to steel. The characteristics are completed by the reduced layer thickness of 0.8-1.2 µm and a high temperature stability up to 500°C. Because of this the material adhesion is significantly reduced.



The SG6 coating

HiPIMS of the latest generation with outstanding layer smoothness and density. It can withstand a high thermal load of more than 1000°C and is therefore ideal for difficult thread forming processes.



The SG7 coating

Droplet-free HiPIMS process of the latest technology for reliable blind hole machining in steel. Improved chip removal and reduced friction between workpiece and tool ensure longer tool life.

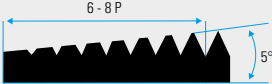
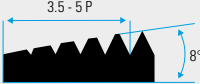
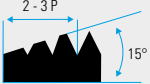
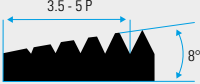
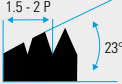
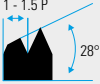


The SG8 coating

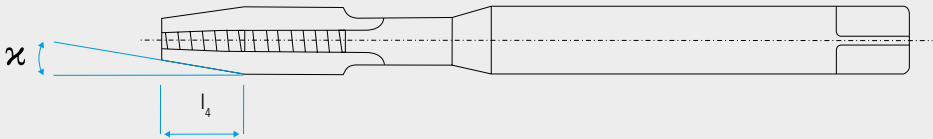
Innovative PVD coating system characterised by good oxidation resistance and high hardness. The coating is ideal for machining hard materials and for dry machining at very high application temperatures.



Chamfer Types

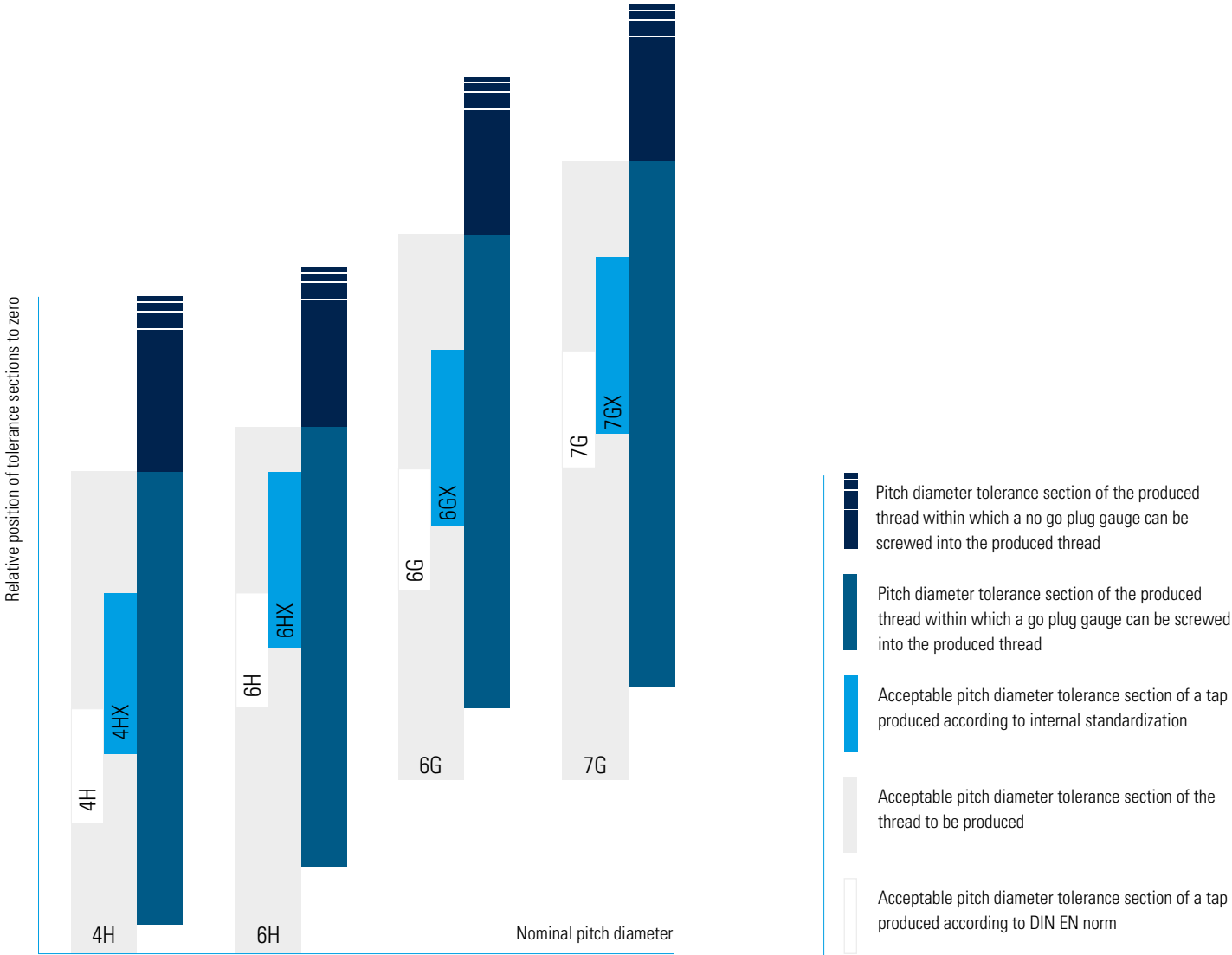
Form	Chamfer length $l_4^{1)}$ [x pitch]	Chamfer angle α [°]	Main field of application:	
A	6 to 8	5°	short through holes	
B	3.5 to 5	8°	through holes in mid and long chipping materials	
C	2 to 3	15°	blind holes and through holes in short chipping materials	
D	3.5 to 5	8°	blind holes with long thread run-out and through holes	
E	1.5 to 2	23°	blind holes with very short thread run-out	
F	1 to 1.5	> 28°	blind holes with very short thread run-out	

¹⁾ The number of pitches is a simple, practice-oriented criterion for defining the chamfer length of taps



Tolerance Levels

Schematic description of production tolerances applicable for metric internal thread – in addition please also find below the specific tolerance fields for tap production.



Cutting Data

Definition of rotation and cutting speeds for threading tools.

The table below contains the calculated values of rotation and cutting speeds for threading tools between M 3 and M 42. In most cases these calculations will serve for workshop use in practice. If interim values should be required, these can be calculated by drawing upon the formulas listed below.

nominal/diameter		round per minute [1/min]											
M3	425	530	635	850	1060	1270	1590	2120	2330	2650	2965	3180	3390
M4	319	398	480	635	795	955	1190	1590	1750	1990	2230	2390	2550
M5	255	318	382	510	635	765	955	1270	1400	1590	1785	1910	2040
M6	212	265	318	425	530	635	795	1060	1170	1325	1485	1590	1700
M8	159	198	238	318	398	478	598	795	875	995	1115	1195	1275
M10	127	159	191	255	318	382	478	636	700	795	892	955	1020
M12	106	133	159	212	265	318	398	531	584	664	744	795	850
M14	91	114	136	182	228	273	342	455	500	568	636	682	728
M16	80	100	119	159	199	239	299	398	438	497	557	597	637
M18	71	88	106	142	177	212	265	354	388	442	495	530	565
M20	64	80	95	127	159	192	239	318	350	398	446	478	510
M22	58	72	87	116	145	174	217	290	318	362	405	435	463
M24	53	66	80	106	133	159	200	266	292	332	372	398	425
M27	47	59	71	95	118	142	177	236	260	295	330	355	378
M30	42	53	64	85	106	127	159	212	234	265	297	318	340
M33	39	48	58	77	96	116	145	193	212	242	270	290	309
M36	35	44	53	71	88	106	133	177	195	221	248	265	283
M39	33	41	49	65	82	98	122	163	180	205	228	245	262
M42	30	38	45	61	76	91	114	152	167	190	212	228	243
	4	5	6	8	10	12	15	20	22	25	28	30	32
	Cutting speed v [m/min]												

legend:

v = Cutting speed [m/min]
d = Nominal tap diameter [m]
n = Tool spindle rotation [1/min]
 $\pi = 3.14$

$v = d \times \pi \times n$

$n = \frac{v}{d \times \pi}$

Work Piece Material Groups/Cutting Data

Material Groups		Description	DIN Description	DIN 17 007 Material-No.	Strength [N/mm ²]	Cutting Speed v _c [m/min] v _c forming taps = v _c + 30-50% HSS-E / VHM	
DIN ISO 513	Schumacher					bright	coated
P	P1	Carbon steels	St 33	1.0035	290	10 - 15	15 - 25
	P1	Carbon steels	St 37	1.0120	340 - 370	10 - 15	15 - 25
	P1	Carbon steels	St 50	1.0531	470 - 610	10 - 15	15 - 25
	P1	Carbon steels	St 60 - 2	1.0060	570 - 710	10 - 15	15 - 25
	P1	Carbon steels	St 70 - 2	1.0070	670 - 830	10 - 15	15 - 25
	P1	Heat-treatable steels	C 45	1.0503	650 - 800	10 - 15	15 - 25
	P1	Tool steels	21 MnCr 5	1.2162	720	8 - 10	10 - 15
	P1	Free-cutting steels	9 S 20 K	1.0711	360	10 - 15	15 - 25
	P1	Free-cutting steels	9 SMnPb 28	1.0718	380	10 - 15	15 - 25
	P1	Free-cutting steels	35 SMn 20	1.0726	490 - 610	10 - 15	15 - 25
	P1	Hot-Work steels	X 10 CrSi 13	1.4722	690	3 - 5	5 - 8
	P1	Cast Steels	GS 45	1.0443	440	10 - 15	15 - 25
	P1	Cast Steels	GS 60	1.0553	590	10 - 15	15 - 25
	P1	Cast Steels	GS 70	1.0554	685	10 - 15	15 - 25
	P1	Case-hardened steels	C 15	1.0401	600 - 800	10 - 15	15 - 25
	P1	Case-hardened steels	Ck 15	1.1141	500 - 800	10 - 15	15 - 25
	P2	Case-hardened steels	20 MnCr 5	1.7147	1000 - 1300	10 - 15	15 - 25
	P2	Case-hardened steels	17 CrNiMo 6	1.6587	1050 - 1350	2 - 5	5 - 10
	P2	Heat-treatable steels	C 60	1.0601	800 - 850	10 - 15	15 - 25
	P2	Heat-treatable steels	46 Cr 2	1.7003	700 - 850	2 - 5	5 - 10
	P2	Heat-treatable steels	25 CrMo 4	1.7218	800 - 950	2 - 5	5 - 10
	P2	Tool steels	105 WCr 6	1.2419		8 - 10	10 - 15
	P2	Tool steels	X 45 NiCrMo 4	1.2767	850	8 - 10	10 - 15
	P2	Tool steels	55 Ni Cr Mo V 6	1.2713	810	8 - 10	10 - 15
	P2	Nitriding Steels	31 CrMo 12	1.8515	1000 - 1200	3 - 5	5 - 8
	P2	Nitriding Steels	34 CrAlMo 5	1.8505	800 - 950	3 - 5	5 - 8
	P2	Nitriding Steels	34 CrAlNi 7	1.8550	850 - 1050	3 - 5	5 - 8

Work Piece Material Groups/Cutting Data

Material Groups		Description	DIN Description	DIN 17 007 Material-No.	Strength [N/mm2]	Cutting Speed v_c [m/min] v_c forming taps = $v_c + 30\text{-}50\%$ HSS-E / VHM	
DIN ISO 513	Schumacher					bright	coated
M	M1	Stainless steels ferritic	X 6 Cr 13	1.4000	400 - 600	3 - 5	5 - 8
	M1	Stainless steels ferritic	X 4 CrMoS 18	1.4105	450 - 650	3 - 5	5 - 8
	M1	Stainless steels martensitic	X 30Cr 13	1.4028	800 - 1000	3 - 5	5 - 8
	M1	Stainless steels martensitic	X 12 CrMoS 17	1.4104	600 - 840	3 - 5	5 - 8
	M1	Stainless steels austenitic	X 5 CrNi 18 10	1.4301	500 - 700	3 - 5	5 - 8
	M1	Stainless steels austenitic	X 6 CrNiMoTi 17 12 2	1.4571	500 - 730	3 - 5	5 - 8
	M1	Stainless steels austenitic	X 2 CrNiMo 18 14 3	1.4435	490 - 690	3 - 5	5 - 8
	M1	Cast Steels	G X 6 CrNiMo 18 10	1.4408	440 - 640	3 - 5	5 - 8
	M1	Cast Steels	G X 2 CrNiMoN 17 13 5	1.4439	490 - 690	3 - 5	5 - 8
	M2	Duplex steels	X 2 CrNiMoN22-5-3	1.4462	880	3 - 5	5 - 8
K	K1	Grey cast iron	EN-GJL-100 (GG 10)	0.6010	88	8 - 12 25 - 30	12 - 20
	K1	Grey cast iron	EN-GJL-200 (GG 20)	0.6020	195	8 - 12 25 - 30	12 - 20
	K1	Grey cast iron	EN-GJL-300 (GG 30)	0.6030	295	8 - 12 25 - 30	12 - 20
	K1	Grey cast iron	EN-GJL-400 (GG 40)	0.6040	390	8 - 12 25 - 30	12 - 20
	K2	Nodular cast iron	EN-GJS-400-15 (GGG 40)	0.7040	400	5 - 8	10 - 20
	K2	Nodular cast iron	EN-GJS-500-7 (GGG 50)	0.7045	500	5 - 8	10 - 20
	K2	Nodular cast iron	EN-GJS-600-3 (GGG 60)	0.7060	600	5 - 8	10 - 20
	K3	Malleable cast iron	EN-GJMW-400-5 (GTW-40)	0.8040	400	10 - 15	15 - 20
	K3	Malleable cast iron	EN-GJMW-450-7 (GTW-45)	0.8045	450	10 - 15	15 - 20
	K3	Malleable cast iron	EN-GJMW-550-4 (GTW-55)	0.8055	550	10 - 15	15 - 20
	K3	Malleable cast iron	EN-GJMB-350-10 (GTS-35)	0.8135	350	10 - 15	15 - 20
	K3	Malleable cast iron	EN-GJMB-450-6 (GTS-45)	0.8145	450	10 - 15	15 - 20
	K3	Malleable cast iron	EN-GJMB-550-4 (GTS-55)	0.8155	550	10 - 15	15 - 20
N	N1	Aluminium wrought alloys	AlMn 1	3.0515	150 - 200	20 - 25	25 - 35
	N1	Aluminium wrought alloys	AlMg 3	3.3535	200 - 300	20 - 25	25 - 35
	N1	Aluminium wrought alloys	AlMgSiPb	3.0615	200 - 270	20 - 25	25 - 35
	N1	Aluminium wrought alloys	AlZn 4.5 Mg 1	3.4335		20 - 25	25 - 35
	N2	Aluminium cast alloys	G-Al Mg 3	3.3541	140 - 200	20 - 30	30 - 40
	N2	Aluminium cast alloys	G-Al Cu 4	3.1841	280 - 400	20 - 30	30 - 40
	N2	Aluminium cast alloys	G-Al Si 10 Mg	3.2381	250 - 320	20 - 30	30 - 40
	N3	Copper alloys	E-Cu	2.0060	250	10 - 15	15 - 20
	N3	Copper alloys	SE-Cu	2.0070	300	10 - 15	15 - 20
	N3	Special copper alloys	Ampco 18		159 - 183	2 - 4	4 - 6
	N3	Special copper alloys	Ampco 21		285 - 311	2 - 4	4 - 6
	N3	Special copper alloys	Ampco 25		356 - 394	2 - 4	4 - 6

Work Piece Material Groups/Cutting Data

Material Groups		Description	DIN Description	DIN 17 007 Material-No.	Strength [N/mm2]	Cutting Speed v_c [m/min] v_c forming taps = $v_c + 30\text{-}50\%$ HSS-E / VHM	
DIN ISO 513	Schumacher					bright	coated
N	N4	Brass long chipping	Cu Zn 30 (Ms 70)	2.0265		20 - 25 30 - 50	25 - 35
	N4	Brass short chipping	CuZn 39 Pb 2 (Ms 58)	2.0380		20 - 25 30 - 50	25 - 35
	N4	Brass short chipping	Cu Zn 40 Al 2	2.0550		20 - 25 30 - 50	25 - 35
	N5	Bronze short chipping	CuPb 5 Sn 5	2.1170	250	10 - 15	15 - 20
	N5	Bronze long chipping	Cu Sn 6	2.1030	400 - 550	10 - 15	15 - 20
	N5	Bronze	G-CuPb 10 Sn	2.1176	230	10 - 15	15 - 20
	N6	Thermoplastics long chipping	Hostalen			20 - 30	30 - 40
	N6	Thermoplastics long chipping	Makrolon			20 - 30	30 - 40
	N6	Thermoplastics long chipping	PS Polystyrol			20 - 30	30 - 40
	N6	Thermoplastics long chipping	POM Polymethylen			20 - 30	30 - 40
	N6	Thermoplastics long chipping	PVC Ployvinylchlorid			20 - 30	30 - 40
	N6	Thermoplastics long chipping	PA Polyamid			20 - 30	30 - 40
	N7	Duroplastics short chipping	Bakelit			3 - 5	5 - 8
	N7	Duroplastics short chipping	Pertinax			3 - 5	5 - 8
	N7	Duroplastics short chipping	Ferrozell			3 - 5	5 - 8
	N7	Duroplastics short chipping	Resopal			3 - 5	5 - 8
	N8	Magnesium alloys	AZ 91			-	15 - 20
S	S1	Pure titanium	Ti 99.5	3.7024.1	290 - 410	2 - 4	4 - 6
	S1	Pure titanium	Ti 99.4	3.7055	450 - 550	2 - 4	4 - 6
	S1	Titanium alloys	TiAl 5 Sn 2	3.7114	840 - 990	2 - 4	4 - 6
	S1	Titanium alloys	Ti Al 6V4	3.7165	910 - 1100	2 - 4	4 - 6
	S2	Pure nickel	Ni 99.6	2.4060	370 - 590	2 - 4	4 - 6
	S2	Pure nickel	Ni 99.2	2.4068	340 - 540	2 - 4	4 - 6
	S2	Nickel alloys	Monel 400	2.4360	800	2 - 4	4 - 6
	S2	Nickel alloys	Hastelloy C	2.4812	900	2 - 4	4 - 6
	S2	Nickel alloys	Inconel 600	2.4816	700	2 - 4	4 - 6
	S2	Nickel alloys	Nimonic 90	2.4632	1200	2 - 4	4 - 6
H	H1	Hardened steels	up to 50 HRC			6 - 8	2 - 4
	H2	Hardened steels	up to 55 HRC			1 - 3	1 - 3
	H2	Hardened steels	up to 60 HRC			1 - 3	-

item code	catalog page	item code	catalog page	item code	catalog page
10100	2.85	30300/25	2.6	31700/48	2.32
10105	2.85	30300/2540	2.6	31800	2.34
10200	2.85	30500/4853	2.74	31900/25	2.36
10205	2.87	30510/0253	2.76	31900/26	2.36
10300	2.87	30510/2453	2.76	31900/5760	2.39
10305	2.87	30530/4853	2.78	32000	2.41
12100	3.16	30550/5367	2.80	32000/25	2.41
12200	3.16	30600/2553	2.82	32000/2540	2.41
13100	4.12	30600/53	2.82	32400	2.43
13200	4.12	30600 B/2553	2.82	32400/48	2.43
13500	4.10	30800/54	2.8	32600	2.46
13600	4.11	30810/4064	2.10	32800	2.48
15100	5.21	30810/64	2.10	33000	2.50
15200	5.21	30900/4060	2.12	33000/25	2.53
15300	5.21	31000/02	2.13	33000/42	2.53
16100	5.39	31000/24	2.13	33000 B	2.50
16200	5.39	31100	2.15	33000 E	2.50
17100	6.3	31100/25	2.18	33005	2.53
17200	6.3	31100/42	2.18	33010/6368	2.55
17300	6.1	31100 B	2.15	33030/4048	2.57
17500	6.2	31100 E	2.15	33030/48	2.57
18100	6.5	31105	2.18	33300/25	2.59
18200	6.5	31130/48	2.20	33300/26	2.59
18300	6.4	31200/25	2.22	33300/5760	2.62
20100	2.89	31200/26	2.22	33400/48	2.64
20200	2.89	31210/48	2.24	33500/25	2.66
20300	2.89	31300/48	2.26	33500/26	2.66
30000	2.2	31400	2.28	33510/48	2.68
30200	2.5	31600	2.30	33600/02	2.70
30300/01	2.6	31700	2.32	33600/24	2.70

item code	catalog page	item code	catalog page	item code	catalog page
33800	2.72	40000	2.4	41800	2.35
33800/48	2.72	40300/01	2.7	41900/25	2.38
34000	5.1	40300/25	2.7	41900/26	2.38
34300/01	5.3	40300/2540	2.7	41900/5760	2.40
34500	5.5	40500/4853	2.75	42000	2.42
34500/25	5.5	40510/0253	2.77	42000/25	2.42
34600/25	5.7	40510/2453	2.77	42000/2540	2.42
34600/26	5.7	40530/4853	2.79	42400	2.44
34800	5.12	40550/5367	2.81	42400/48	2.44
34900/26	5.9	40600/2553	2.84	42410/4048	2.45
35200	5.14	40600/53	2.84	42600	2.47
35200/25	5.14	40800/54	2.9	42800	2.49
35300/25	5.16	40810/4064	2.11	43000	2.52
35300/26	5.16	40810/64	2.11	43000/25	2.54
35600/2553	5.20	41000/02	2.14	43000/42	2.54
35600/53	5.20	41000/24	2.14	43000 B	2.52
35900/26	5.18	41100	2.17	43005	2.52
36000	5.22	41100/25	2.19	43010/63	2.56
36300/01	5.24	41100/42	2.19	43030/48	2.58
36500	5.26	41100 B	2.17	43300/25	2.61
36500/25	5.26	41105	2.17	43300/26	2.61
36600	5.28	41130/48	2.21	43300/5760	2.63
36600/25	5.28	41200/25	2.23	43400/48	2.65
36800	5.32	41200/26	2.23	43500/25	2.67
36900/26	5.30	41210/48	2.25	43500/26	2.67
37200	5.33	41300/48	2.27	43510/48	2.69
37200/25	5.33	41400	2.29	43600/02	2.71
37300	5.35	41600	2.31	43600/24	2.71
37300/25	5.35	41700	2.33	43800	2.73
37900/26	5.37	41700/48	2.33	43800/48	2.73

item code	catalog page	item code	catalog page	item code	catalog page
44000	5.2	51200	3.10	G0100/41	2.90
44300/01	5.4	51200/25	3.10	G0600/5360	2.93
44500	5.6	51900/26	3.11	G0700/5360	2.93
44500/25	5.6	52000	3.12	G0800/40	2.91
44600/25	5.8	53000	3.13	G0800	2.91
44600/26	5.8	53000/25	3.13	G2600/40	2.92
44710/4048	5.11	53300/26	3.14	G5800/40	3.19
44800	5.13	53500	3.15	S1000	7.8
44900/26	5.10	53500/25	3.15	S1200	7.9
45200	5.15	55000	4.1	S1400	7.10
45200/25	5.15	55300/01	4.2	S2000	7.2
45300/25	5.17	56000	4.3	S2200	7.3
45300/26	5.17	56000/25	4.3	S2400	7.4
45900/26	5.19	56200	4.4	S4000	7.5
46000	5.23	56200/25	4.4	S4200	7.6
46300/01	5.25	56900/26	4.5	S4400	7.7
46500	5.27	57000	4.6		
46500/25	5.27	58000	4.7		
46600	5.29	58000/25	4.7		
46600/26	5.29	58300/26	4.8		
46900/26	5.31	58500	4.9		
47200	5.34	58500/25	4.9		
47200/25	5.34	68100	6.7		
47300	5.36	68105	6.8		
47300/25	5.36	68200	6.7		
47900/26	5.38	68205	6.8		
50000	3.1	68300	6.7		
50300/01	3.5	68305	6.8		
51000	3.6	68500	6.6		
51000/25	3.6	68505	6.6		

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Responsible

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Concept, Design und Production

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www.jpg-grafik.de

Date

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