Paramètres de coupe indicatifs
Empfohlene Schnittwerte
Standard machining data

ISO-Line G tolerance class	Tough grade, for normal to difficult machining conditions	Wear resistant grade, for finishing and light machining	P Acier / Stahl / Steel						M Inox / Rostfreistahl / Stainless steel			
			Acier de décolletage / Automatenstahl / Free-cutting steel		Acier faiblement allié / Leicht legierter Stahl / Low alloyed steel		Acier fortement allié / Hochlegierter Stahl / High alloyed steel		Austénitique / Austenitisch / Austenitic		Martensitique / Martensitisch / Martensitic	
			VC (m/min)	F (mm/U)	VC (m/min)	F (mm/U)	VC (m/min)	F (mm/U)	VC (m/min)	F (mm/U)	VC (m/min)	F (mm/U)
FN-X8	TiAlN	HTA	80-180	0.01-0.12	60-150	0.01-0.10	50-120	0.01-0.08	60-140	0.01-0.12	60-140	0.01-0.12
	TiAlX	HTAX	80-180	0.01-0.12	60-150	0.01-0.10	50-120	0.01-0.08	60-140	0.01-0.12	60-140	0.01-0.12
	TiN		80-170	0.01-0.12	60-140	0.01-0.10			60-120	0.01-0.12	60-120	0.01-0.12
	N	HN										
ENP-X8	TiAlN	HTA	80-180	0.03-0.15	60-160	0.03-0.12	50-120	0.03-0.10	60-140	0.03-0.12	60-140	0.03-0.15
	TiN		80-170	0.03-0.15	60-150	0.03-0.12			60-120	0.03-0.12	60-120	0.03-0.15
	N	HN										
FN-X17	TiAlN	HTA	80-180	0.01-0.12	60-150	0.01-0.10			60-140	0.01-0.15	60-140	0.01-0.15
	TiAlX	HTAX	80-180	0.01-0.12	60-150	0.01-0.10	50-120	0.01-0.08	60-140	0.01-0.12	60-140	0.01-0.12
	TiN		80-170	0.01-0.12					60-120	0.01-0.15	60-120	0.01-0.15
	N	HN										
ENP-X17	TiAlN	HTA	80-180	0.03-0.15	60-160	0.03-0.12	50-120	0.03-0.10	60-140	0.03-0.15	60-140	0.03-0.18
	TiAlX	HTAX	80-180	0.01-0.12	60-150	0.01-0.10	50-120	0.01-0.08	60-140	0.01-0.12	60-140	0.01-0.12
	TiN		80-170	0.03-0.15	60-150	0.03-0.12			60-120	0.01-0.15	60-120	0.03-0.18
	N	HN										
FN-X25	TiAlN	HTA							60-140	0.01-0.12		
	TiN								60-120	0.01-0.12		
	N	HN										
ENP-X25	TiAlN	HTA							60-140	0.03-0.12	60-140	0.03-0.15
	TiAlX		80-180	0.01-0.12	60-150	0.01-0.10	50-120	0.01-0.08	60-140	0.01-0.12	60-140	0.01-0.12
	TiN								60-120	0.03-0.12	60-120	0.03-0.15
	N	HN										
ENP-X20	ZTA								60-140	0.03-0.18	60-140	0.03-0.18
		HTiX							60-140	0.03-0.18	60-140	0.03-0.18

G tolerance class Special 35° VC..-11												
FL / FR-X10	TiAlN	HTA	80-180	0.01-0.12	60-150	0.01-0.10	50-120	0.01-0.08	60-140	0.01-0.12	60-140	0.01-0.12
	TiAlX	HTAX	80-180	0.01-0.12	60-150	0.01-0.10	50-120	0.01-0.08	60-140	0.01-0.12	60-140	0.01-0.12
	TiN		80-170	0.01-0.12	60-140	0.01-0.10			60-120	0.01-0.12	60-120	0.01-0.12
	N	HN										
ELP/ERP-X10	TiAlN	HTA	80-180	0.03-0.15	60-160	0.03-0.12	50-120	0.03-0.10	60-140	0.03-0.12	60-140	0.03-0.15
	TiAlX	HTAX	80-180	0.03-0.15	60-160	0.03-0.12	50-120	0.03-0.10	60-140	0.03-0.12	60-140	0.03-0.15
	TiN		80-170	0.03-0.15	60-150	0.03-0.12			60-120	0.03-0.12	60-120	0.03-0.15
	N	HN										
FN-K18		HTA	80-180	0.01-0.10	60-150	0.01-0.10			60-140	0.01-0.10	60-140	0.01-0.10
		HTiN	80-170	0.01-0.10	60-140	0.01-0.10			60-120	0.01-0.10	60-120	0.01-0.10
		HN										
FN-0		HTA	80-150	0.01-0.10								
		HTiN	80-140	0.01-0.10								
		HN										

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N Alliages d'aluminium et non ferreux Aluminium- und Nichteisenlegierungen Aluminium and non-ferrous alloys								S Titane et superalliages Titan und Superlegierungen Titanium and superalloys					
Aluminium		Al-Si		Cuivre Kupfer Copper		Laiton & bronze Messing & Bronze Brass & bronze		Ti grade 1 - 3		Ti grade 4 - 6		Superalliages Superlegierungen Superalloys	
VC (m/min)	F (mm/U)	VC (m/min)	F (mm/U)	VC (m/min)	F (mm/U)	VC (m/min)	F (mm/U)	VC (m/min)	F (mm/U)	VC (m/min)	F (mm/U)	VC (m/min)	F (mm/U)
		150-1600	0.01-0.15	80-300	0.01-0.12	100-400	0.01-0.15			30-60	0.01-0.12	40-70	0.01-0.10
								30-70	0.01-0.12	30-60	0.01-0.12	40-70	0.01-0.10
120-2200	0.01-0.18	150-1600	0.01-0.15	80-300	0.01-0.12	100-400	0.01-0.15						
120-2000	0.01-0.18	150-1500	0.01-0.15	80-250	0.01-0.12	100-300	0.01-0.15	30-70	0.01-0.12				
		150-800	0.03-0.18	80-300	0.03-0.15					30-60	0.03-0.12	40-70	0.03-0.10
		150-800	0.03-0.18	80-300	0.03-0.15								
		150-800	0.03-0.18	80-250	0.03-0.15								
		150-1600	0.01-0.18	80-300	0.01-0.15	100-400	0.01-0.18			30-70	0.01-0.15	40-80	0.01-0.12
								30-70	0.01-0.12	30-60	0.01-0.12	40-70	0.01-0.10
120-2200	0.01-0.25	150-1600	0.01-0.18	80-300	0.01-0.15	100-400	0.01-0.18						
120-2000	0.01-0.25	150-1500	0.01-0.18	80-250	0.01-0.15	100-300	0.01-0.18	40-80	0.01-0.15				
		150-800	0.03-0.20	80-300	0.03-0.18					30-70	0.03-0.15	40-80	0.03-0.12
								30-70	0.01-0.12	30-60	0.01-0.12	40-70	0.01-0.10
		150-800	0.03-0.20	80-300	0.03-0.18								
		150-800	0.03-0.20	80-250	0.03-0.18								
		150-1600	0.01-0.22	80-300	0.01-0.18					30-60	0.01-0.12	40-70	0.01-0.10
120-2200	0.01-0.30	150-1600	0.01-0.22	80-300	0.01-0.18								
120-2000	0.01-0.30	150-1500	0.01-0.22	80-250	0.01-0.18			30-70	0.01-0.12				
		150-800	0.03-0.25	80-300	0.03-0.20					30-60	0.03-0.12	40-70	0.03-0.10
								30-70	0.01-0.12	30-60	0.01-0.12	40-70	0.01-0.10
		150-800	0.03-0.25	80-300	0.03-0.20								
		150-800	0.03-0.25	80-250	0.03-0.20								
		150-800	0.03-0.25	80-300	0.03-0.20					40-90	0.03-0.15	40-100	0.03-0.15
		150-800	0.03-0.25	80-300	0.03-0.20					40-80	0.03-0.15	40-90	0.03-0.15

		150-1600	0.01-0.18	80-300	0.01-0.15	100-400	0.01-0.18			30-60	0.01-0.12	40-70	0.01-0.10
								30-70	0.01-0.12	30-60	0.01-0.12	40-70	0.01-0.10
120-2200	0.01-0.20	150-1600	0.01-0.18	80-300	0.01-0.15	100-400	0.01-0.18						
120-2000	0.01-0.20	150-1500	0.01-0.18	80-250	0.01-0.15	100-300	0.01-0.18	30-70	0.01-0.12				
		150-1600	0.03-0.20	80-300	0.03-0.18					30-60	0.03-0.12	40-70	0.03-0.10
										30-60	0.03-0.12	40-70	0.03-0.10
		150-1600	0.03-0.20	80-300	0.01-0.18								
		150-1500	0.03-0.20	80-250	0.01-0.18								
		150-1600	0.01-0.12	80-300	0.01-0.10					30-70	0.01-0.10	40-80	0.01-0.10
120-2200	0.01-0.15	150-1600	0.01-0.12	80-300	0.01-0.10								
120-2000	0.01-0.15	150-1500	0.01-0.12	80-250	0.01-0.10			40-80	0.01-0.10				
						100-400	0.01-0.18						
						100-400	0.01-0.18						
						100-300	0.01-0.18						

Paramètres de coupe indicatifs
Empfohlene Schnittwerte
Standard machining data

ISO-Line M tolerance class	Tough grade, for normal to difficult machining conditions	Wear resistant grade, for finishing and light machining	P Acier / Stahl / Steel						M Inox / Rostfreistahl / Stainless steel			
			Acier de décolletage / Automatenstahl / Free-cutting steel		Acier faiblement allié / Leicht legierter Stahl / Low alloyed steel		Acier fortement allié / Hochlegierter Stahl / High alloyed steel		Austénitique / Austenitisch / Austenitic		Martensitique / Martensitisch / Martensitic	
			VC (m/min)	F (mm/U)	VC (m/min)	F (mm/U)	VC (m/min)	F (mm/U)	VC (m/min)	F (mm/U)	VC (m/min)	F (mm/U)
EN-XF3	TAC	HTAC	100-200	0.03-0.15	80-160	0.03-0.12	50-120	0.03-0.10	60-140	0.03-0.12	60-140	0.03-0.15
EN-XF2	TAC	HTAC	100-200	0.03-0.15	80-160	0.03-0.12	50-120	0.03-0.10	60-140	0.03-0.12	60-140	0.03-0.15
		HTi5	100-250	0.03-0.15	80-220	0.03-0.12	50-180	0.03-0.10	80-200	0.03-0.12	80-200	0.03-0.15
EN-MF2	TAC	HTAC	100-200	0.04-0.15	80-160	0.04-0.12	50-120	0.04-0.10	60-140	0.04-0.12	60-140	0.04-0.15
	Ti5	HTi5	100-250	0.04-0.15	80-220	0.04-0.12	50-180	0.04-0.10	80-200	0.04-0.12	80-200	0.04-0.15
EN-MF	Tmax		100-220	0.04-0.30	80-180	0.04-0.25	50-150	0.04-0.20	60-150	0.04-0.25	60-150	0.04-0.25
	Ti4		100-250	0.05-0.30	80-220	0.05-0.25	50-180	0.05-0.20	80-200	0.05-0.25	80-200	0.05-0.25
EN-HF3	TiX	HTiX	100-220	0.06-0.35	80-180	0.06-0.30	50-150	0.06-0.25	60-150	0.06-0.25	60-150	0.06-0.25
	Ti6		100-250	0.06-0.35	80-220	0.06-0.30	50-180	0.06-0.25	80-200	0.06-0.25	80-200	0.06-0.25
EN-HF	Tmax		100-220	0.08-0.40	80-180	0.08-0.35	50-150	0.08-0.30	60-150	0.08-0.30	60-150	0.08-0.30
	TAC		100-200	0.08-0.40	80-160	0.08-0.35	50-140	0.08-0.30	60-140	0.08-0.30	60-140	0.08-0.30
	Ti4		100-250	0.08-0.40	80-220	0.08-0.35	50-180	0.08-0.30	80-200	0.08-0.30	80-200	0.08-0.30
	Ti5	HTi5	100-280	0.08-0.40	80-250	0.08-0.35	50-200	0.08-0.30	80-220	0.08-0.30	80-220	0.08-0.30
ISO-Line CERMET												
FN-X8 CERMET	CTA		100-350	0.01-0.12	80-300	0.01-0.10	70-250	0.01-0.08	80-250	0.01-0.12	80-250	0.01-0.12
	CN6		100-300	0.01-0.12	80-250	0.01-0.10	70-200	0.01-0.08				
ENP-KX CERMET	CT7	HCT7	100-350	0.03-0.20	80-300	0.03-0.18	70-250	0.03-0.15	80-250	0.03-0.18	80-250	0.03-0.18
	CN6		100-300	0.03-0.20	80-250	0.03-0.18	70-200	0.03-0.15				
EN-KM CERMET	CT7	HCT7	100-350	0.03-0.25	80-300	0.03-0.20	70-250	0.03-0.18	80-250	0.03-0.20	80-250	0.03-0.20
	CN6		100-300	0.03-0.25	80-250	0.03-0.20	70-200	0.03-0.18				

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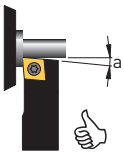
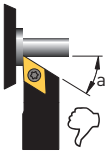
N Alliages d'aluminium et non ferreux Aluminium- und Nichteisenlegierungen Aluminium and non-ferrous alloys								S Titane et superalliages Titan und Superlegierungen Titanium and superalloys					
Aluminium		Al-Si		Cuivre Kupfer Copper		Laiton & bronze Messing & Bronze Brass & bronze		Ti grade 1 - 3		Ti grade 4 - 6		Superalliages Superlegierungen Superalloys	
VC (m/min)	F (mm/U)	VC (m/min)	F (mm/U)	VC (m/min)	F (mm/U)	VC (m/min)	F (mm/U)	VC (m/min)	F (mm/U)	VC (m/min)	F (mm/U)	VC (m/min)	F (mm/U)
		120-1500	0.03-0.20	80-300	0.03-0.15	100-400	0.03-0.18			30-70	0.03-0.15	40-80	0.03-0.12
						100-400	0.03-0.18			30-70	0.03-0.15	40-80	0.03-0.12
		120-1500	0.04-0.20	80-300	0.04-0.15	100-400	0.04-0.18			30-70	0.04-0.15	40-80	0.04-0.12
										30-70	0.06-0.20	40-80	0.06-0.20

Conseils d'utilisation
Anwendungsempfehlungen
Application recommendations

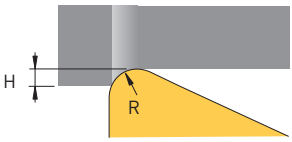


- pour un meilleur état de surface et une meilleure stabilité d'usinage, choisir une géométrie d'outil permettant un angle "a" le plus petit possible
- für bessere Oberflächegüte und Bearbeitungsstabilität, muss die Werkzeuggeometrie mit kleinstmöglichem Winkel "a" ausgewählt werden



- for a better surface finish and better machining stability, choose a tool geometry with angle "a" as small as possible

rapport hauteur de passe / rayon d'outil
Verhältnis zwischen Spantiefe und Werkzeugradius
machining depth / tool radius ratio



H min = 0.7 X R
R max = 1.4 X H