CUTTING DATA - TSN45 HIGH SHEAR MILLS

CUTTING DATA FOR FACE MILLS						Coated									Cermet			Uncoated		
ISO 513	MILLING CUTTER / MATERIAL					TN7525			TN25M			TN7535/TN450			TTI-25			TTM		
P	Cutter	Max. a_p	Carbide Insert			Feed fz inches per tooth [1]														
	TSN45 [1]	.236	SN..-1205 AZR-21 / SN..-1205 AZR-31			.006	**.013**	.018	.006	**.013**	.018	.006	**.014**	.020	.005	**.009**	.013	.006	**.013**	.018
	Work Material		Condition	Hardness HB	Mat. Gr.	Cutting Speeds in SFPM														
	Carbon steel, Unalloyed steel, cast steel and free cutting steel	< 0.25% C	annealed	125	1	1333	**1056**	910	1170	**910**	780	813	**699**	650	1463	**1121**	975	715	**634**	585
		≥ 0.25% C	annealed	190	2	1056	**813**	699	813	**618**	536	585	**488**	455	1235	**910**	780	520	**423**	390
		< 0.55% C	heat-treated	250	3	894	**683**	601	683	**520**	455	488	**423**	390	1008	**764**	650	423	**325**	293
		≥ 0.55% C	annealed	220	4	910	**699**	601	699	**536**	455	520	**455**	423	1138	**845**	715	455	**358**	325
			heat-treated	300	5	764	**553**	471	585	**423**	358	423	**358**	325	---	**---**	---	358	**293**	260
	Low alloy steel and cast steel		annealed	200	6	1024	**764**	634	780	**585**	488	585	**488**	455	1235	**910**	910	520	**423**	390
			heat-treated	275	7	764	**601**	520	585	**455**	390	455	**390**	358	---	**---**	---	390	**325**	293
			heat-treated	300	8	683	**520**	423	520	**390**	325	390	**325**	293	---	**---**	---	325	**260**	228
			heat-treated	350	9	601	**423**	---	455	**325**	---	325	**228**	---	---	**---**	---	293	**195**	---
	High alloy steel, cast steel & tool steel		annealed	200	10	764	**618**	553	585	**471**	423	520	**439**	390	1170	**861**	715	455	**358**	325
			heat-treated	325	11	520	**390**	---	390	**293**	---	325	**228**	---	---	**---**	---	293	**195**	---
M	Cutter	Max. a_p	Carbide Insert			Feed fz inches per tooth [1]														
	TSN45 [1]	.236	SN..-1205 AZR-21 / SN..-1205 AZR-31			.005	**.010**	.014	.005	**.010**	.014	.005	**.010**	.014	.004	**.008**	.010	.005	**.010**	.014
	Work Material		Condition	Hardness HB	Mat. Gr.	Cutting Speeds in SFPM														
	400 series Stainless & cast steel		ferrit./mart.	200	12	975	**910**	634	748	**569**	488	553	**488**	455	1138	**845**	715	488	**390**	358
			martensitic	240	13	845	**618**	520	650	**471**	390	455	**390**	358	975	**748**	650	423	**325**	293
	300 series Stainless & cast steel		austenitic	180	14	845	**520**	---	650	**390**	---	488	**293**	---	---	**---**	---	390	**260**	---

CUTTING DATA FOR FACE MILLS						Coated			Uncoated		
ISO 513	MILLING CUTTER / MATERIAL					TN5515			THM		
K	Cutter	Max. a_p	Carbide Insert			Feed fz inches per tooth [1]					
	TSN45 [1]	.236	SN..-1205 AZR-21 / SN..-1205 AZR-31			.007	**.014**	.020	.007	**.017**	.024
	Work Material		Condition	Hardness HB	Mat. Gr.	Cutting Speeds in SFPM					
	Grey cast iron		ferrit./pearl.	180	15	1235	**910**	764	520	**390**	325
			pearlitic	260	16	943	**699**	601	390	**293**	260
	Nodular cast iron		ferritic	160	17	1056	**764**	634	455	**341**	293
			pearlitic	250	18	764	**471**	---	325	**228**	---
	Malleable cast iron		ferritic	130	19	1056	**634**	---	455	**293**	---
			pearlitic	230	20	845	**520**	---	358	**228**	---
N	Cutter	Max. a_p	Carbide Insert			Feed fz inches per tooth [1]					
	TSN45 [1]	.236	SN..-1205 AZR-21 / SN..-1205 AZR-31			---	**---**	---	.006	**.014**	.020
	Work Material		Condition	Hardness HB	Mat. Gr.	Cutting Speeds in SFPM					
	Cast aluminium alloys		≤12% Si	75	23	---	**---**	---	3250	**2340**	1950
			age-hardened	90	24	---	**---**	---	2600	**1918**	1625
			>12% Si heat resistant	130	25	---	**---**	---	1625	**1056**	813
	Copper & copper alloys		Red Brass, brass	90	27	---	**---**	---	1300	**813**	---
			Bronze	100	28	---	**---**	---	975	**585**	---
S	Cutter	Max. a_p	Carbide Insert			Feed fz inches per tooth [1]					
	TSN45 [1]	.236	SN..-1205 AZR-21 / SN..-1205 AZR-31			.004	**.006**	.008	.004	**.006**	.008
	Work Material		Condition	Hardness HB	Mat. Gr.	Cutting Speeds in SFPM					
	High-temperature alloys Ni- or Co- based		age-hardened	280	32	130	**98**	81	98	**75**	65
			annealed	250	33	104	**78**	65	78	**62**	52
			age-hardened	350	34	85	**62**	52	65	**49**	42
	Titanium alloys		age-hardened	RM1050	37	---	**---**	---	---	**---**	---

[1] The feeds per tooth f_z are valid for a width of cut $a_e \geq 40\%$ of the cutter diameter. In the case of smaller widths of cut, the feed f_z should be increased as per the following table:

Ratio $a_e : d_1$	f_z factor
5%	3
10%	2
20%	1.5
≥ 40%	1