STELLRAM

Calculation of the average chip thickness in relation with the a_e (Radial Engagement) if a_e is less than 50% of dia.

Formula: Programme Feed Rate (f_z)

$$f_z = h_m \times \sqrt{\frac{d}{a_e}}$$

h_m = Average chip thickness
a_e = Radial engagement
f_z = Feed per tooth
d = Cutter diameter

Formula: Average Chip Thickness (h_m)

$$h_m = f_z \times \sqrt{\frac{a_e}{d}}$$

Multiplication factor for the feed rate based on the percentage of radial engagement of the cutter diameter

Cutter Ø 25mm			Cutter Ø 32mm			Cutter Ø 40mm		
a_e %	a_e mm	Coefficient Factor	a_e %	a_e mm	Coefficient Factor	a_e %	a_e mm	Coefficient Factor
5	1,25	2,30	5	1,60	2,30	5	2,00	2,30
10	2,50	1,66	10	3,20	1,66	10	4,00	1,66
15	3,75	1,40	15	4,80	1,40	15	6,00	1,40
20	5.00	1,25	20	6,40	1,25	20	8,00	1,25
25	6,25	1,16	25	8,00	1,16	25	10,00	1,16
35	8,75	1,05	35	11,20	1,05	35	14,00	1,05
50 - 100	12,50 - 25,00	1,00	50 - 100	16,00 - 32,00	1,00	50 - 100	20,00 - 40,00	1,00

Multiplication factor for the feed rate based on the percentage of radial engagement of the cutter diameter

Cutter Ø 50mm			Cutter Ø 63mm			Cutter Ø 80mm		
a_e %	a_e mm	Coefficient Factor	a_e %	a_e mm	Coefficient Factor	a_e %	a_e mm	Coefficient Factor
5	2,50	2,30	5	3,15	2,30	5	4,00	2,30
10	5,00	1,66	10	6,30	1,66	10	8,00	1,66
15	7,50	1,40	15	9,45	1,40	15	12,00	1,40
20	10,00	1,25	20	12,60	1,25	20	16,00	1,25
25	12,50	1,16	25	15,75	1,16	25	20,00	1,16
35	17,50	1,05	35	22,05	1,05	35	28,00	1,05
50 - 100	25,00 - 50,00	1,00	50 - 100	31,50- 63,00	1,00	50 - 100	40,00 - 80,00	1,00

Example: 50mm diameter cutter using a 5,0mm radial engagement (a_e) = 10% of the cutter diameter.
At 10%, your coefficient is 1,66 (see chart); therefore you must multiply your feed rate by 1,66 for correcting the feed for profiling.