

Typical Radial Turbine Sizing Guidelines

Nomenclature:

Station Location	Metal Angle	Flow Angle	Radial Location	Passage Height	Metal Thickness
Nozzle Inlet	α_{2M}	α_2	r2	b2	t2
Nozzle Exit	α_{3M}	α_3	r3	b3	t3
Impeller Inlet	β_{4M}	β_4	r4	b4	t4
Impeller Exit	β_{5M}	β_5	r5h & r5s	b5	t5

α – absolute flow angle

β – relative flow angle

δ_R – impeller tip clearance

ΔZ_R – impeller axial length

BPC – blades per circle

NPC – nozzles per circle

Parameter	Min Value	Max Value	Initial Target
r2/r3	1.19	1.26	1.23
NPC	14	25	17
α_3	13.2	23.2	**
r3/r4	1.045	1.2	1.05
β_4	75	95	90
i4	7	-30	-20
b4/r4	0.125	0.3	**
t4/r4	0.02	0.04	0.02
t5/r4	0.012	0.022	0.02
r5h/r4	0.185	0.279	**
r5s/r4	0.62	0.8	**
β_5	29	41	**
$\delta_R/r4$	0.004	0.005	0.005
$\Delta Z_R/r4$	0.64	0.77	**
BPC	11	23	15

** These parameters must be decided on a case by case basis