Given				Cp (J/kgK)	T (K)	p_t (Pa)	ρ_t (kg/m^3)	Vt_tot (m^3/s)	ṁ_tot (kg/s)	Vt_loc (m^3/s)	ê (J/kg)	P_m (kW)	e	ω (rad/sec)	rev/sec	rev/min	σ	ψ	ϕ	T_loc/T_t	T_loc (K)	p_loc/p_t	p_loc (static, Pa)	p_dynamic (Pa)	Total pressure	a*_c	M*_c		ρ_loc/ρ_t	ρ_loc (kg/m^3)	a*_w	M*_w		a*_u	M*_u	
N	19		Into blade inner	1004.5	293.15	100000	1.19	5.00	5.9429	5.34	127743.54	790.80	108582.01	984.37	156.67	9400	0.12	1.22	0.35	0.9741	285.5662743	0.912345973	91234.5973	8480.14548	99714.74278	313.30	0.39	OK	0.9366	1.1132	316.33	0.52	OK	313.30	0.34	OK
ψ	1.22		Into blade mean	1004.5	293.15	100000	1.19	5.00	5.9429	5.34	127743.54	790.80	108582.01	984.37	156.67	9400	0.12	1.22	0.35	0.9741	285.5662743	0.912345973	91234.5973	8480.14548	99714.74278	313.30	0.39	OK	0.9366	1.1132	323.28	0.71	OK	313.30	0.62	OK
ϕ	0.35		Into blade outer	1004.5	293.15	100000	1.19	5.00	5.9429	5.34	127743.54	790.80	108582.01	984.37	156.67	9400	0.12	1.22	0.35	0.9741	285.5662743	0.912345973	91234.5973	8480.14548	99714.74278	313.30	0.39	OK	0.9366	1.1132	330.09	0.86	False	313.30	0.81	OK
π_t	3		Out blade inner	1004.5	420.32	300000	2.49	2.39	5.9429	3.43	127743.54	790.80	108582.01	984.37	156.67	9400.00	0.12	1.22	0.35	0.8656	363.8353643	0.6034376619	181031.2986	98368.68502	279399.9836	375.15	0.90	OK	0.6971	1.7337	357.52	0.53	OK	375.15	1.12	OK
V_t1 (m^3/s)	5	m^3/s	Out blade mean	1004.5	420.32	300000	2.49	2.39	5.9429	3.43	127743.54	790.80	108582.01	984.37	156.67	9400.00	0.12	1.22	0.35	0.8656	363.8353643	0.6034376619	181031.2986	98368.68502	279399.9836	375.15	0.90	OK	0.6971	1.7337	357.52	0.53	OK	375.15	1.12	OK
η_c	0.85		Out blade outer	1004.5	420.32	300000	2.49	2.39	5.9429	3.43	127743.54	790.80	108582.01	984.37	156.67	9400.00	0.12	1.22	0.35	0.8656	363.8353643	0.6034376619	181031.2986	98368.68502	279399.9836	375.15	0.90	OK	0.6971	1.7337	357.52	0.53	OK	375.15	1.12	OK
η_T	0.96		Into Diffuser	1004.5	420.32	300000	2.49	2.39	5.9429	3.22	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.8874	372.9825078	0.6582257293	197467.7188	87718.77316	285186.492	375.15	0.82	OK	0.7418	1.8447	N/A	N/A		N/A	N/A	
R (J/(kgK))	287	J/kgK	Out Diffuser	1004.5	420.32	300000	2.49	2.39	5.9429	2.57	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.9718	408.4865763	0.9048727106	271461.8132	27526.809	298988.6222	375.15	0.41	OK	0.9311	2.3155	N/A	N/A		N/A	N/A	
k	1.4																																		

constraints		
r2/r1	2.16	OK
r2/rS	1.66	False
b2/r2	0.04	OK
rS/rH	2.38	OK
r5/r2	1.25	OK
r4/r2	1.08	OK
C5/C4	0.50	OK
Cu2*r2	129.77	
Cm2*r2*p2_loc	109.73	
Cm1/Cm2	0.84	Changed D1i to get within 0.8-1.25
W2/W1 (inner)	1.16	OK
W2/W1 (mean)	0.82	OK
W2/W1 (outer)	0.67	OK
Cm4*r4*p4_loc	109.73	

<1.7 OK, mixed flow

CHOOSE

	Into blade			Out blade			Into Diffuser	Out Diffuser	
	inner (rH)	mean (r1)	outer (rS)	inner (r2)	mean (r2)	outer (r2)	(r4)	(r5)	
u (m/s)	106.96	195.24	254.56	421.90	421.90	421.90	0.00	0.00	u (m/s)
Cu (m/s)	0.00	0.00	0.00	302.78	302.78	302.78	280.34	126.30	Cu (m/s)
Cm (m/s)	123.43	123.43	123.43	147.67	147.67	147.67	128.50	88.45	Cm (m/s)
C (m/s)	123.43	123.43	123.43	336.87	336.87	336.87	308.39	154.19	C (m/s)
Wu (m/s)	106.96	195.24	254.56	119.13	119.13	119.13	0.00	0.00	Wu (m/s)
Wm (m/s)	123.43	123.43	123.43	147.67	147.67	147.67	0.00	0.00	Wm (m/s)
W (m/s)	163.33	230.99	282.91	189.73	189.73	189.73	0.00	0.00	W (m/s)
α (deg)	90.00	90.00	90.00	24.21	24.21	24.21	24.62	35.00	α (deg)
β (deg)	49.09	32.30	25.87	51.11	51.11	51.11	0.00	0.00	β (deg)
D (m)	0.109	0.198	0.259	0.429	0.429	0.429	0.463	0.536	D (m)
b (m)	0.150	0.150	0.150	0.017	0.017	0.017	0.017	0.017	b (m)

Deviation	
N	19
μ	0.842105
Cu2_inf (m/s)	359.5493
Wu2_inf (m/s)	62.35
β2B (deg)	67.10711
δ2=Δβ2	16.00
α5B (deg)	40.00
δs	5.00

Am_1 outer (m^2)	π/4(D1o^2-D1i^2)	0.043251003		Am_2 (m^2)	π*D*b	0.02321396319	Am_4 (m^2)	π*D*b	0.02507170562
V1 (m^3/s)	Cm*Am	5.338600949		u_2 (m)	r2*ω	421.9043596	V4 (m^3/s)	Cm*Am	3.221606266
Vt_loc - V1=0		0.0000		u_2 - u_2=0		0.0000	Vt4_loc - V4=0		0.0000
		OK				OK			OK
[Am_1 outer] /2		0.021625501		V2 (m^3/s)	Cm*Am	3.427925295	Am_5 (m^2)	π*D*b	0.02901745399
Am_1 inner (m^2)	π/4(D1^2-D1i^2)	0.021625502		Vt_loc - V2=0		0.0000	V5 (m^3/s)	Cm*Am	2.566546574
[(Am_1 outer) / 2]-Am_1 inner		0.0000				OK	Vt5_loc - V5=0		0.0000
		OK							OK