STYRENE PARK OFFSITE

Document Title:

Axial Fan Data Sheet

Rev.	Issued Date	DESCRIPTION	PREPARED	CHECKED	APPROVED
R1	06-08-2024	IFA	F.Aghaienezhad	J.Beigloo	A.Gholizadeh
R0	22-06-2024	IFA	F.Aghaienezhad	J.Beigloo	A.Gholizadeh

REVISION RECORD SHEET

Page	Revisions								Page	Revisions						
Page	R0	R1	R2	R3	R4	R5	R6			R0	R1	R2	R3	R4	R5	R6
1	X	X							41							
2	X	X							42							
3	X	X							43							
4	X	X							44							
5	X	X							45							
6	X	X							46							
7	X	X							47							
8	X	X							48							
9	X	X							49							
10	X	X							50							
11									51							
12									52							
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35									75							
36									76							
37									77							
38									78							
39									79							
40									80							

AXIAL FAN DATA SHEET (PROJECT 1158) Qty = 4				
BASIC DATA				
1	Item No.		Air Cooler	
2	Quantity	Manual Adjustable Pitch	100%	
		Automatic Adjustable Pitch	-	
3	Positioner		NO	
4	BEARING BLOCK		YES	
5	Blade Material	Aluminum (ASTM,B-179)	YES	
		Fiber glass	NO	
6	Type of Air cooler/ Inlet		FORCED / CONICAL L/D=0.05	
7	Fan Diameter		7/ 2134	(ft /mm)
8	Fan Ring Diameter		2156	(mm)
9	Fan Ring Height		600	(mm)
10	Altitude		20	(m)
11	Relative Humidity		65	(%)
12	Temperature inlet /outlet		48 /52.28	(° C)
13	Actual flow		26.879	(m3/s)
14	Actual static pressure		102.95	(Pa)
15	Fan RPM		382	(rpm)
16	Tip speed		42.7	(m/s)
17	Motor power rating		7.5	(KW)
18	Noise level (at one meter)		85	(db)
19	Min Temperature		5	° C

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Customer Name	Job Reference
Job Name	
Item Number	Date **8/6/2024**

CHARACTERISTICS

Required Volume	**26.87**	m³/sec	Required Static Pressure	**102.95**	Pa
Pressure recovery	**0.00**	Pa	Fan static pressure	**102.95**	Pa
Velocity pressure	**28.98**	Pa	Total pressure	**131.93**	Pa
Air Temperature	**48.0**	°C	Site Elevation	**20.0**	m
Inlet Air Humidity (%)	**65.0**		Inlet Air Density	**1.068**	kg/m
Fan diameter	**2134**	mm	Fan ring diameter	**2155**	mm
Blade Airfoil	**24L**	ALU	Rotor hub type	**B3**	
Speed	**382.0**	RPM	Blade Tip Speed	**42.68**	m/sec
N° blades	**4**		Blade Operating Freq. +/-5%	**722**	cpm
Static efficiency	**61.4**	%	Total efficiency	**78.7**	%
Blade pitch angle	**8.5**	(°)	Rotor shaft power	**4.5**	kW
Min. Ambient Temperature	**5.0**	°C	Rotor shaft power @ 5.0 °C	**5.3**	kW
			Rotor shaft power @ API point	**6.0**	kW
Pressure Margin (%)	**65** [1] / **95** [2]		Volume Margin (%)	**28** [1]	
Tip Clearance/D	**0.005**		Inlet	**Conical L/D=0.05**	
Diffuser angle (°)			Diffuser:Length/D		
Inlet Obstacle a/A			Inlet Obstacle x/D		
Outlet Obstacle a/A			Outlet Obstacle x/D		
Installation Type	**Forced**		Aerod axial force	**472**	N
Rotor total weight	**52**	kg			
Rotor inertia PD²	**35**	kg x m²			
Max residual unbalance	**13.1**	N			
Blade Failure Load	**3847**	N			
2 Blades Failure Load	**5441**	N			
Xs Static deflection	**55**	mm	Xr Running deflection	**43**	mm

[1] according to API [2] at Design Pitch Angle

In G.A fan ring ID is 2156 mm . So There is a discrepancy

NOISE CHARACTERISTICS

Tolerance on sound values +/- 2 dB(A)

PWL (± 2)	SPL @	Inlet / outlet (± 2)	Side (± 2)
86 dB(A)	**1.0** m From Fan	**78** dB(A)	**65.8** dB(A)

Octave [Hz]	31.5	63	125	250	500	1000	2000	4000	8000

ROTOR MODEL 2134- 4-24L/B3T **PAC**

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PWL [dB]	89.0	91.0	91.0	87.0	84.0	81.0	73.0	69.0	65.0
Inlet/Outlet SPL [dB]	81.0	83.0	83.0	79.0	76.0	73.0	65.0	61.0	57.0
Side SPL [dB]	68.8	70.8	70.8	66.8	63.8	60.8	52.8	48.8	44.8
Tolerance +/-	5.0	5.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0

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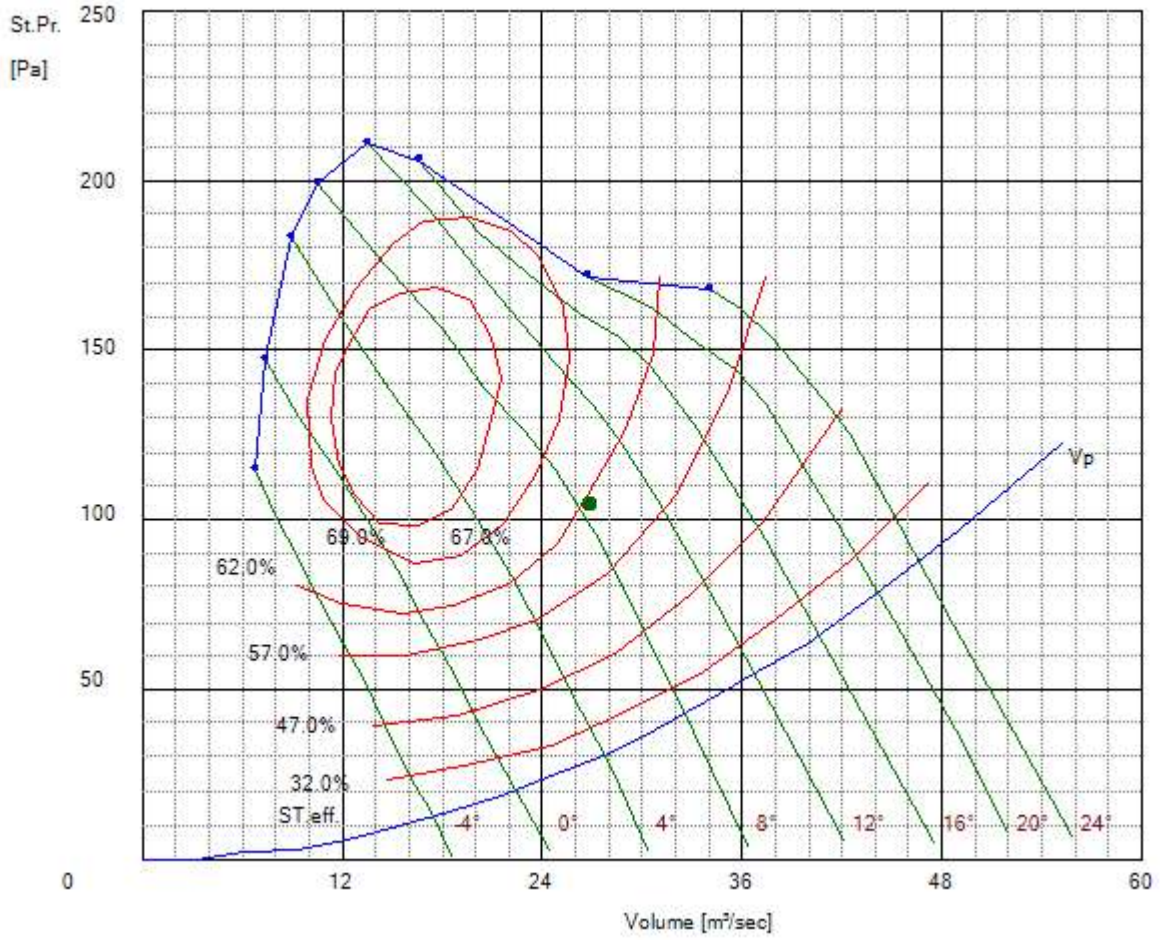
Please define each color in below curve.

E



Inlet Air Density 1.068 kg/m³
382 RPM = 42.68 m/sec
Pressure recovery 0.00 Pa
Rotor shaft power 4.5 kW
PWL (± 2) 86 dB(A)

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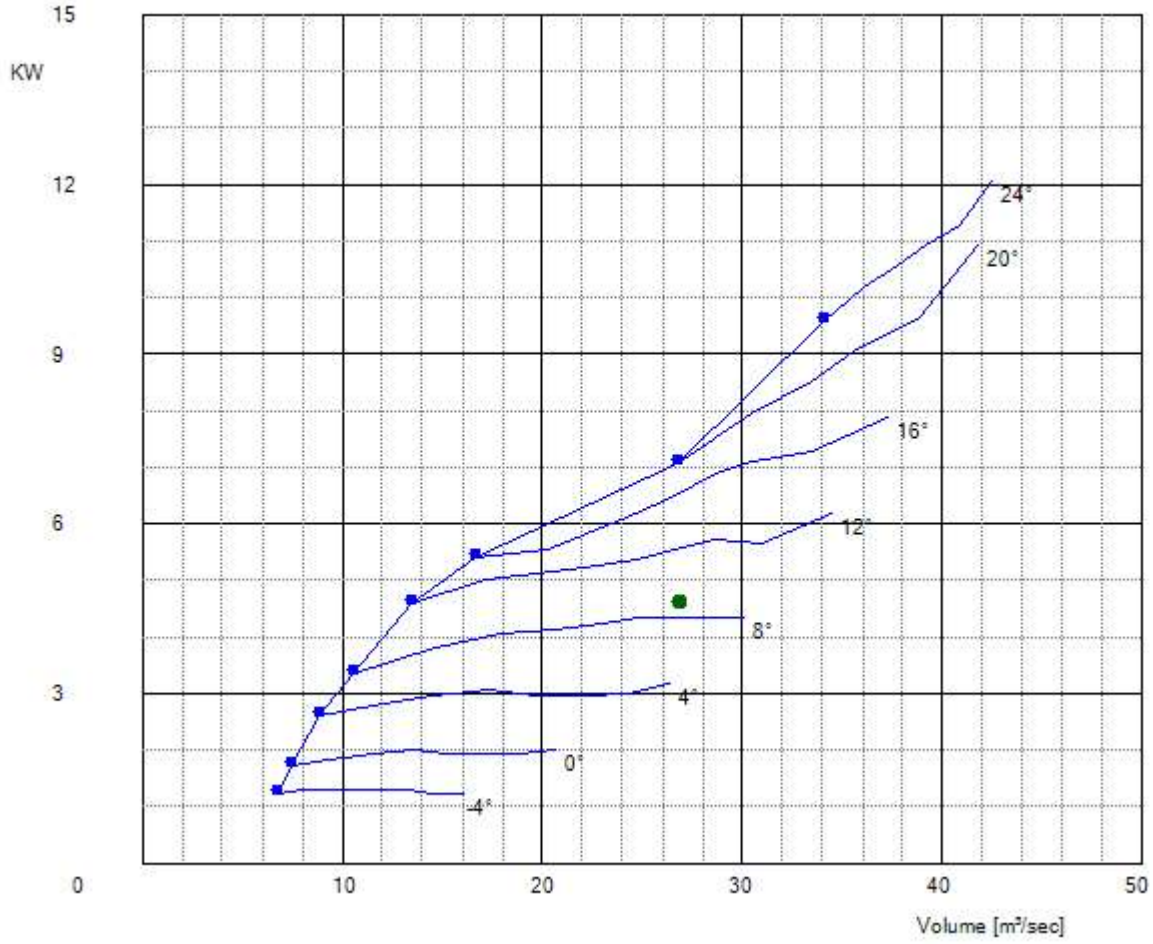
FAN POWER vs VOLUME CURVE



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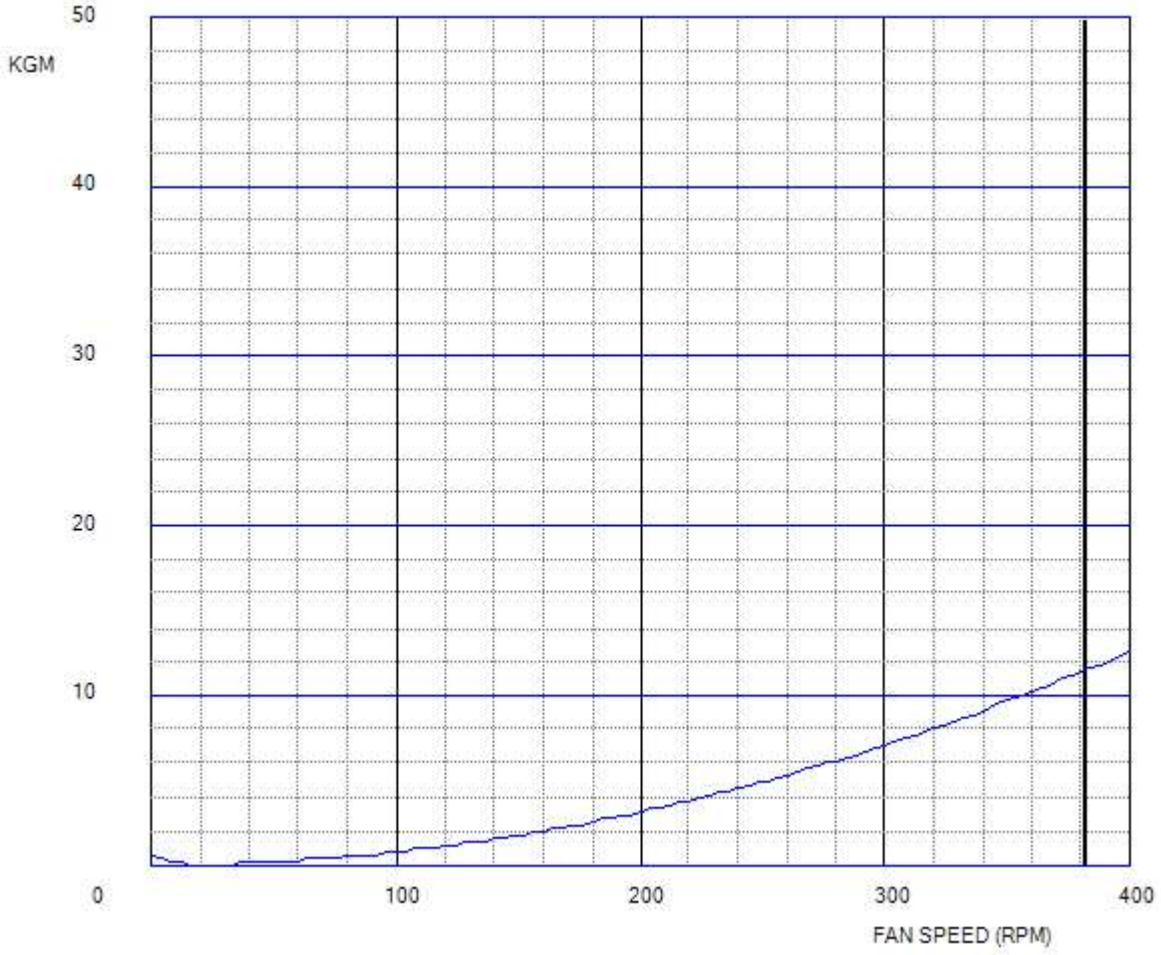
TORQUE CURVE



Rotor shaft power 4.5 kW
RPM = 382.0
Torque @ 382.0 rpm = 11.5 kgm

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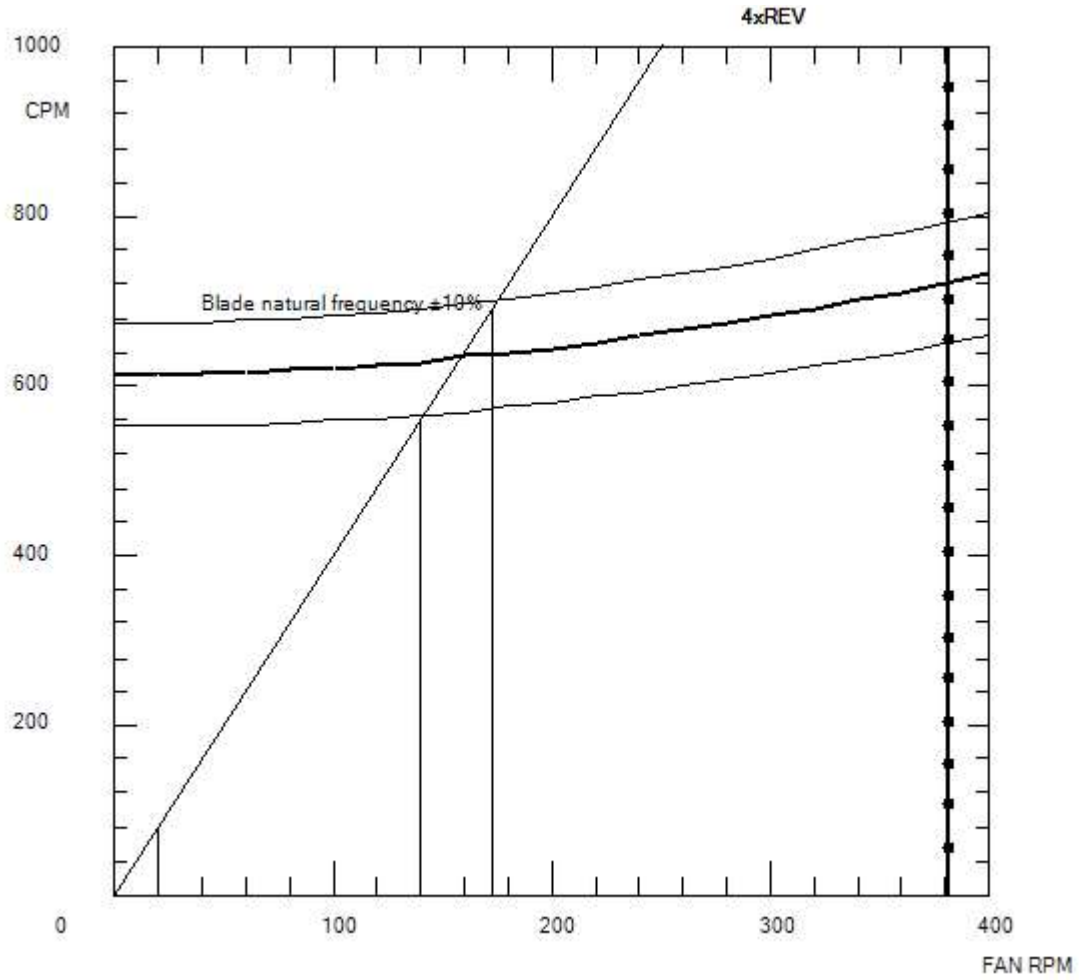
CAMPBELL DIAGRAM



N° blades 4

382 RPM = 42.68 m/sec

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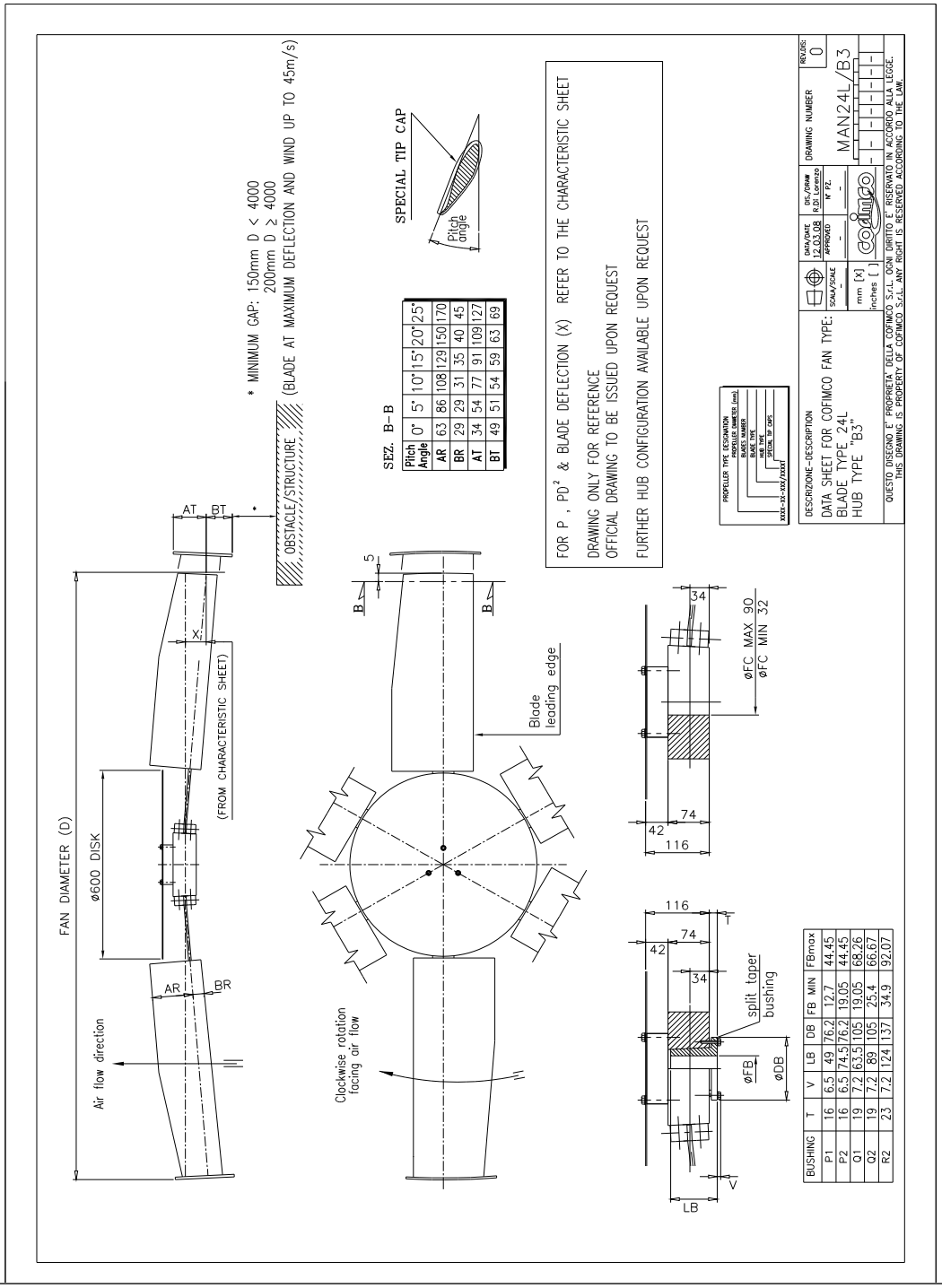

Pitch Angle	0°	5°	10°	15°	20°	25°
AR	63	86	108	129	150	170
BR	29	29	31	35	40	45
AT	34	54	77	91	109	127
BT	49	51	54	59	63	69

BUSHING	T	V	LB	DB	FB MIN	FBmax
P1	16	6.5	49	76.2	12.7	44.45
P2	16	6.5	74.5	76.2	19.05	44.45
Q1	19	7.2	63.5	105	19.05	68.26
Q2	19	7.2	89	105	25.4	66.67
R2	23	7.2	124	137	34.9	92.07

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