PV Calculation Worksheet

PV (**P**ressure x **V**elocity) is a method of calculating bearing capacity by determining the amount of heat generated in a plane bearing. PV is the relationship of the load to the shaft speed.

(**F** _____ ÷ **A** _____) = **P** _____ x **V** _____ = **PV** _____

F: load on bearing
A: Journal diameter x bearing LTB
V: from chart below
PV: operational PV of bearing
NTE PV limit of material from box below

Calculate **P** (**P**ressure) by figuring F/A (force divided by area)

F = load on the bearing
A = journal size x length thru bore (LTB)

Use this chart to determine **V** (**V**elocity):

1. Find row that reflects speed
2. Find column that reflects journal size
3. The point where these two meet is **V** for this application

Material Operating Limits

Limiting	P	V	PV
PA	800	50	1,000
AA	2,000	200	2,000
NA	2,000	350	6,000
QB	3,000	400	50,000
QF	6,000	400	60,000
MA	6,000	400	110,000

Bearing / Journal Surface Speed Calculations (V = Surface Feet per Minute)

Journal Speed (in RPM)	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	3	4
1500	197	294	393	492	590	786	983	1179	1376	1572
1000	131	197	262	328	393	524	655	786	917	1048
900	118	177	236	295	354	472	590	708	826	944
800	105	157	210	262	315	420	524	628	734	838
700	92	138	184	230	276	368	459	551	642	734
600	79	118	158	197	236	316	393	472	551	629
550	73	108	145	180	217	288	361	432	505	577
500	66	98	131	164	197	262	328	393	459	524
450	59	88	118	148	177	236	295	354	413	468
400	53	79	105	131	158	210	262	315	367	420
350	46	69	92	115	138	184	230	276	321	369
300	40	59	79	98	118	158	197	236	276	315
250	33	49	66	82	99	132	164	197	230	262
200	27	39	53	66	79	106	131	158	184	210
175	23	35	46	58	69	92	115	138	161	184
150	20	30	40	49	59	80	99	118	138	158
100	14	20	27	33	40	53	66	80	92	105
75	10	15	20	25	30	40	50	60	69	79
50	7	10	14	16	20	26	33	40	46	53
25	4	5	7	8	10	13	17	20	23	26

Journal Size (diameter in inches)

Marginal - double check load (P) before selecting a plane bearing

Not recommended to use plane bearings