Kemp_ef_1943
&
Melley_ef_1943
Data Sheet 1

SONIC VET CALCULATIONS

(1) M_1	(2) u_1/a^* f(M_1)	(3) P_1/P_0 f(M_1)	(4) Assume $\hat{}$ (P_2/P_0)	(5) P_2/P_3	(6) A_2/A_3	(7) A_1/A_3 $1-(\ 6)$	(8) P_2/P_1 $\frac{(5)(4)}{(3)}$	(9) $1+\gamma(1)^2$	(10) (7)+(9)	(11) (10)÷(6)	(12) (10)+(11)	(13) $(12)^2$	(14) $\frac{1}{1+\gamma}$	(15) $\left(\frac{\gamma-1}{\gamma+1}\right)^2(13)$	(16) $\left(\frac{1}{2}\right)^2$	(17) (7)(16)	(18) (6)(8)	(19) (17)+(18)	(20) $(\gamma(19))^2$	(21) (15)-(20)	(22) $\sqrt{(21)}$	(23) $\frac{p_2}{p_1}$ (14)+(22)	(24) $\frac{A_2}{A_1}$ (8)/(7)	(25) 1 + (24)	(26) (16)÷(25)	(27) $-\frac{1}{\frac{\gamma-1}{2}}\frac{(25)}{(26)}$	(28) $(27)^2\frac{\gamma+1}{\gamma-1}$	(29) $\frac{u_2}{a^*}$ $\sqrt{(28)}$	(30) $\frac{u_2}{a^*}$ (27)+(29)	(31) M_2 f(30)	(32) $1+.2015(31)^2$	(33) $\frac{P_2}{P_3}$ $(32)^{3.47}$	(34) $\frac{P_2}{P_0}$ (23)(3)	(35) $\frac{P_2}{P_3}$ (33)(34)
0.4	.43	.895	2	.528	.05	.95	1.181	1.2245	1.1620	.1423	1.3043	1.70	.5410	.5795	.372	.3534	.0891	.4125	.3360	.2495	.4995	1.0945	.05265	1.05265	.4246	-6.345	46.14	6.795	.450	.42	1.0355	1.0954	.925	1.012
					.10	.90			1.1010	.2845	1.3855	1.92	.5750	.6550		.3350	.1181	.4531	.4065	.2495	.4995	1.0745	.11111	1.11111	.483	-6.110	43.29	6.880	.470	.434	1.0380	1.1022	.961	1.060
					.15	.85			1.0400	.4270	1.4670	2.15	.6065	.7350		.3160	.1773	.4933	.4800	.2580	.5080	1.1115	.17650	1.17650	.549	-5.390	40.59	6.970	.480	.445	1.0399	1.1075	.996	1.103
			3		.05	.95	1.771		1.162	.213	1.375	1.89	.6700	.8150		.3534	.0886	.4420	.3860	.2590	.5090	1.1105	.17650	1.17650	.549	-5.390	40.59	7.050	.440	.404	1.0329	1.0881	.964	1.048
					.10	.90			1.101	.426	1.427	2.04	.6350	.7945		.3350	.1771	.5121	.5190	.2590	.5090	1.1105	.17650	1.17650	.549	-5.390	40.59	7.045	.445	.412	1.0420	1.0919	1.039	1.134
					.15	.85			1.040	.639	1.679	2.815	.6960	.9500		.3160	.2658	.5818	.6700	.2720	.5215	1.1215	.05265	1.05265	.4246	-6.899	53.44	7.060	.555	.500	1.0502	1.1363	1.102	1.255
			4		.05	.95	2.361		1.162	.285	1.447	2.09	.6000	.7120		.3534	.1161	.4715	.4400	.2720	.5215	1.1215	.05265	1.05265	.4246	-6.899	53.44	7.310	.420	.388	1.0304	1.0811	1.003	1.065
					.10	.90			1.101	.569	1.670	2.79	.6930	.9520		.3350	.2361	.5711	.6450	.3070	.5545	1.2475	.11111	1.11111	.483	-7.090	56.04	7.490	.410	.380	1.0291	1.0777	1.116	1.201
					.15	.85			1.040	.855	1.895	3.60	.7860	1.2260		.3160	.3543	.6703	.8900	.3380	.5810	1.3670	.17650	1.17650	.549	-7.235	58.14	7.820	.385	.352	1.0215	1.0585	1.231	1.427
			6		.01	.99	3.54	1.2246	1.2110	.0851	1.2961	1.68	.537	.673		.3350	.0354	.3934	.306	.3670	.606	1.142	.0101	1.0101	.3821	-7.45	61.54	7.84	.39	.364	1.0267	1.0711	1.022	1.096
					.04	.96			1.175	.341	1.516	2.30	.6285	.7845		.3550	.1416	.4966	.4685	.2960	.5440	1.1725	.04165	1.04165	.41365	-7.30	59.24	7.70	.40	.370	1.0276	1.0736	1.05	1.180
0.6	.63	.782	2	.528	.05	.95	1.35	1.5055	1.43	.1624	1.5924	2.54	.661	.865	.571	.542	.0675	.6095	.282	.133	.362	1.023	.05265	1.05265	.6237	-4.27	24.16	4.915	.645	.61	1.0752	1.208	.8	.965
					.10	.90			1.355	.3248	1.6798	2.82	.697	.951		.514	.135	.649	.831	.130	.3602	1.0562	.11111	1.11111	.6821	-4.255	24.06	4.91	.655	.62	1.0777	1.2156	.826	1.004
			3		.05	.95	2.024		1.43	.2435	1.6735	2.80	.995	.955		.542	.1012	.6432	.818	.137	.37	1.065	.05333	1.05265	.6237	-4.440	25.84	5.065	.625	.592	1.0706	1.1955	.8325	.995
					.10	.90			1.355	.4570	1.8280	3.65	.765	1.16		.514	.2024	.7164	1.014	.146	.382	1.147	.11111	1.11111	.6824	-4.615	27.24	5.215	.600	.57	1.0657	1.1805	.896	1.059
					.15	.85			1.28	.7305	2.0105	4.05	.934	1.382		.485	.3036	.7886	1.24	.142	.3764	1.1804	.17650	1.17650	.7475	-4.710	28.14	5.305	.595	.56	1.0634	1.174	.946	1.111
			4		.05	.95	2.70		1.43	.3250	1.7550	3.085	.728	1.053		.542	.135	.677	.907	.146	.382	1.110	.05265	1.05265	.6237	-4.640	27.44	5.235	.595	.56	1.0634	1.174	.868	1.02
					.10	.90			1.355	.6500	2.0050	4.025	.8525	1.376		.514	.270	.784	1.214	.162	.4025	1.235	.11111	1.11111	.6821	-4.975	30.74	5.555	.580	.544	1.0596	1.1643	.965	1.123
			2		.175	.825	1.35	1.505	1.241	.570	1.903	3.625	.789	1.248		.525	.216	.741	1.064	.164	.405	1.194	.087	1.087	.658	-4.87	29.69	5.45	.58	.544	1.0596	1.165	.933	1.065
			4		.06	.92	2.70		1.393	.520	1.811	3.28	.762	1.119		.4715	.2361	.7076	.99	.129	.359	1.111	.212	1.212	.763	-4.25	24.07	4.91	.66	.626	1.0763	1.220	.866	1.058
			7		.01	.99	4.74		1.499	.1140	1.603	2.575	.665	.8775		.565	.474	.6124	.740	.1375	.3705	1.0355	.0101	1.0101	.5811	-4.45	25.74	5.075	.625	.592	1.0706	1.195	.809	.965
					.03	.97			1.460	.342	1.802	3.260	.7475	1.109		.554	.1422	.6962	.959	.150	.3872	1.1347	.03094	1.03094	.60194	-4.80	29.00	5.235	.595	.56	1.0634	1.174	.868	1.02
					.05	.95			1.430	.570	2.000	4.000	.830	1.364		.542	.2870	.7790	1.200	.164	.4050	1.235	.0527	1.0526	.6236	-5.15	32.44	5.555	.580	.544	1.0596	1.1643	.965	1.123
0.8	.83	.657	3	.528	.05	.95	2.41	1.900	1.805	.2900	2.095	4.39	.869	1.498	.771	.7325	.1205	.853	1.438	.060	.2448	1.1138	.05265	1.05265	.82365	-3.570	18.70	5.555	.580	.544	1.0596	1.165	.933	1.065
					.10	.90			1.71	.6600	2.29	5.25	.95	1.79		.694	.241	.935	1.726	.064	.2626	1.2026	.11111	1.11111	.8821	-3.750	20.02	4.91	.66	.626	1.0763	1.220	.866	1.058
					.15	.85			1.614	.8700	2.484	6.19	1.031	2.11		.655	.3615	1.0165	2.04	.070	.2646	1.2956	.17650	1.17650	.9475	-3.966	21.68	4.965	.645	.61	1.0750	1.202	.925	1.117
			4		.05	.95	3.218		1.805	.387	2.192	4.80	.91	1.638		.7325	.1609	.8934	1.575	.063	.2606	1.2918	.11111	1.11111	.8821	-4.080	22.14	4.96	.645	.61	1.0750	1.202	.925	1.117
					.10	.90			1.71	.774	2.484	6.18	1.031	2.108		.694	.3218	1.0158	2.04	.067	.2588	1.4088	.17650	1.17650	.9475	-4.315	24.56	4.535	.715	.682	1.094	1.2642	.7935	1.002
					.15	.85			1.614	1.161	2.775	7.70	1.150	2.622		.655	.4827	1.1377	2.555	.067	.2586	1.2086	.05265	1.05265	.82365	-3.820	20.54	4.685	.650	.62	1.0776	1.2156	.904	1.098
			5		.05	.95	4.02		1.805	.4535	2.2865	5.24	.95	1.787		.7325	.201	.9335	1.72	.071	.2662	1.3762	.11111	1.11111	.8821	-4.235	23.90	5.32	.585	.55	1.061	1.167	.1014	1.184
					.10	.90			1.71	.967	2.677	7.17	1.110	2.446		.694	.402	1.096	2.375	.074	.272	1.543	.17650	1.17650	.9475	-4.735	28.34	4.26	.760	.73	1.1074	1.3054	.720	.940
					.15	.85			1.614	1.4505	3.0645	9.40	1.271	3.204		.655	.603	1.258	3.13	.069	.2428	1.0948	.0101	1.0101	.7811	-3.50	18.18	4.63	.694	.66	1.0880	1.2462	.814	1.013
			9		.01	.99	7.22	1.900	1.880	.1735	2.054	4.215	.652	1.423		.7635	.0722	.8352	1.380	.067	.2587	1.2587	.03094	1.03094	.60194	-3.956	21.45									
					.03	.97			1.841	.6206	2.362	5.59	.980	1.907		.748	.2166	.9646	1.840															
0.95	.96	.562	3		.05	.95	2.82	2.267	2.17	.3395	2.510	6.3	1.04	2.15	.941	.894	.141	1.035	2.115	.035	.187	1.227	.05275	1.05265	.99365	-3.212	16.26	4.030	.838	.792	1.1264	1.364	.69	.9405
					.10	.90			2.04	.6790	2.719	7.39	1.128	2.52		.846	.282	1.128	2.51	.01	.1	1.228	.11111	1.11111	1.0521	-3.204	16.22	4.027	.823	.794	1.127	1.338	.69	.9415
					.15	.85			1.925	1.0185	2.943	8.66	1.221	2.96		.8	.423	1.223	2.955	.005	.077	1.228	.17650	1.17650	1.1175	-3.37	17.32	4.16	.79	.76	1.1166	1.334	.78	.974
			4		.05	.95	3.76		2.17	.4525	2.6225	6.9	1.089	2.352	.027	.894	.188	1.082	2.815	.027	.1922	1.2812	.05265	1.05265	.99365	-3.356	17.20	4.13	.794	.764	1.1176	1.3364	.72	.962
					.10	.90			2.04	.905	2.945	8.69	1.222	2.96	.01	.846	.376	1.222	2.95	.01	.1	1.322	.11111	1.11111	1.0521	-3.448	17.84	4.225	.777	.746	1.1121	1.3200	.7435	.981
					.15	.85			1.925	1.3575	3.283	10.78	1.363	3.66	.0	.8	.564	1.364	3.63	.0	0	1.363	.17650	1.17650	1.1175	-3.544	18.54	4.3	.766	.728	1.1062	1.3016	.766	.9965
			5		.05	.95	4.70	2.27	2.17	.565	2.735	7.49	1.136	2.552	.037	.894	.235	1.129	2.815	0	9	1.317	.11111	1.11111	1.0521	-3.436	17.74	4.25	.77	.74	1.1104	1.326	.745	.988
					.10	.90			2.04	1.130	3.17	1.003	1.317	3.42	0	.846	.470	1.316	3.42	0	0	1.502	.17650	1.17650	1.1175	-3.91	21.24	4.21	.774	.74	1.1104	1.326	.741	.982
					.15	.85			1.925	1.695	3.62	13.1	1.502	4.465	.041	.202	1.596	.1363	1.1363	.7073	-6.33	46.	4.27	.76	.73	1.1074	1.305	.845	1.100
					.12	.88	4.71		1.996	1.36	3.36	11.3	1.394	3.956	.038	.825	.565	1.390	3.815	.025	.158	1.776	.2196	1.2196	.7906	-6.75	52.5	4.16	.79	.76	1.1166	1.334	.78	.974
					.18	.82			2.13	2.04	3.90	15.2	1.618	5.165		.764	.8475	1.6165	5.16	.02	.1414	1.3814	.0838	1.0838	.6358	-5.725	38.74	4.13	.794	.764	1.1176	1.3364	.72	.962
					.06	.94	5.94		2.13	.857	2.987	8.91	1.24	3.04		.88	.356	1.236	3.02	.04	.2000	1.74	.1363	1.1363	.7073	-6.900	53.54	4.225	.777	.746	1.1121	1.3200	.7435	.981
			6.5		.12	.88			1.996	1.714	3.710	13.8	1.54	4.70		.825	.712	1.537	4.66	.01	.10	1.602	.25	1.25	11191	-4.15	28.18	4.3	.766	.728	1.1062	1.3016	.766	.9965
					.20	.80	3.758	2.267	1.813	1.807	2.2592	5.56	.976	1.895		.9385	.0471	.9756	1.880	.015	.1224	1.0984	.0101	1.0101	.9481	-2.89	14.31	4.25	.77	.74	1.1104	1.326	.741	.982
			5		.01	.99	4.71	2.27	2.2460	.1132	2.9975	9.00	1.243	3.07		.8630	.3765	1.2396	3.06	.02	.1414	1.3844	.0870	1.087	1.025	-3.626	19.14	4.21	.774	.74	1.1104	1.326	.741	.982
					.08	.92			2.09	.9075	3.152	9.94	1.309	3.388	.040	.8175	.4900	1.3075	3.375	.013	.114	1.423	.1494	1.1494	1.0894	-3.702	19.68	4.76	.67	.636	1.0763	1.220	.866	1.058
			4		.13	.87	3.77		1.972	1.180	3.356	11.26	1.382	3.840	.038	.862	.525	1.390	3.815	.035	.1870	1.5690	.0970	1.0970	1.0360	-4.110	22.84	4.730	.67	.636	1.0815	1.227	.878	1.077
			7		.08	.92	6.6		2.066	1.27	3.493	12.20	1.450	4.160		.8355	.564	1.4475	4.140	.020	.1414	1.5914	.0988	1.0989	1.0369	-4.165	23.28	4.825	.66	.628	1.0794	1.2206	.891	1.089
					.09	.91			2.064	1.429	3.627	13.16	1.506	4.485		.8445	.660	1.5045	4.465	.020	.1414	1.6464	.1111	1.1111	1.0491	-4.310	24.84	4.955	.645	.610	1.0750	1.208	.921	1.113
					.10	.90			2.040	1.387	3.620	13.16	1.502	4.48	.041	.7628	.7516	1.5044	4.47														