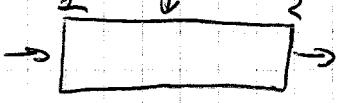
Moto con addizione di Massa



$\gamma=1.4$, $R=287$ $P_{01}=1000\,kPa$ $T_{01}=500K$ $M_1=0.25$ $G_2/G_1=1.6$

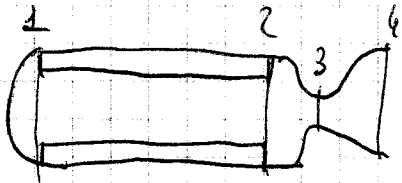
$M_1=0.25 \xrightarrow{ISO} P/P_{01}=0.957$ $T_1/T_{01}=0.988 \rightarrow P_1=9.57\,10^5\,Pa$ $T_1=493.8K$

$\xrightarrow{M_1} \frac{T_1}{T^*}=1.185$ $\frac{P_1}{P^*}=2.207$ $\frac{P_{01}}{P^*}=1.218$ $\frac{G_1}{G^*}=0.5068$

$\frac{G_2}{G^*}=\frac{G_2}{G_1}\frac{G_1}{G^*}=0.8109 \xrightarrow{M_2}$ $M_2=0.677$ $\xrightarrow{M_2}$ $\frac{T_2}{T^*}$ $\frac{P_2}{P^*}$ $\frac{P_{02}}{P^*}$

$P/P_0=$ $T/T_0=$ $T_2=478$ $P_2=$

$M_1=0.5$ $G_2/G_1=0.86$ come sopra



$D_1=0.025\,m$ $L_{12}=0.30m$ $T_{FIAMMA}=3000\,K$ $\dot m=?$ $P_{02}=?$ $P_{01}=?$ G^* (P_2-P_1)

$\dot V=0.025\,m/s$ $R=B20$ $A_3=3.00\,10^{-4}\,m^2$

$\rho_1=2500\,kg/m^3$ $\gamma=1.4$

$\dot m=\dot V\,\rho_1\,\pi D\,L=1.473\,kg/s$ $\frac{P_2}{P_{02}}=0.402$ $\frac{P_{02}}{P^*}=1.16$ $\frac{G_2}{G^*}=0.7105$

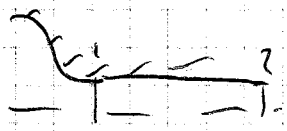
$A_1=\frac{\pi D^2}{4}=4.909\,10^{-4}m^2 \rightarrow \frac{A_1}{A_3}=1.636 \xrightarrow{ISO} M_2=0.386$

Si suppone che $T_{FIAMMA}=T_0$ sempre.

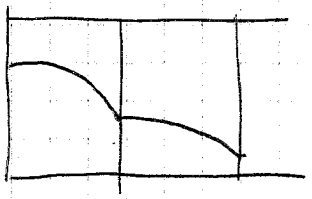
$Q_0=\sqrt{\gamma R T_0}=1159\,m/s$ $P_{02}=\frac{\dot m\,Q_0}{A_3\,\rho^*}=7024\,kPa$

$M_1=0 \rightarrow \frac{P_{01}}{P^*}=1.268$ $P_{01}=\frac{P_{01}}{T_1^*}\frac{P_1^*}{P_{02}}P_{02}=7761\,kPa$ $G_2=\frac{\dot m}{A_2}=3000\,\frac{kg}{s}\frac{1}{m^2} \Rightarrow G^*=6223\,\frac{kg}{s\,m^2}$

$P_2=\frac{P_2}{P_{02}}P_{02}=6337\,kPa$ $\Delta P=P_2-P_{01}=P_2-P_{01}=-1326\,kPa$



$\gamma=1.4$ $R=287$ $P_{01}=125\,kPa$ $T_{01}=350K$ $P_2=100\,kPa$ $G_2/G_1=1.6$



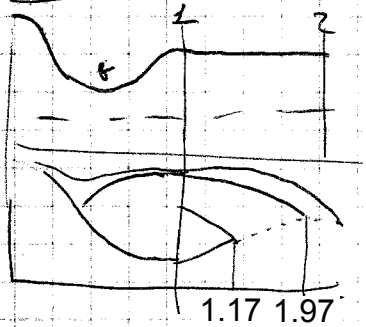
$M_2=1 \rightarrow G_2/G^*=1$ $P_2/P^*=1$

$G_1/G^*=\frac{G_1}{G_2}\frac{G_2}{G^*}=0.625$ $M_1=0.324 \xrightarrow{ISO} \frac{P}{P_{01}}=0.9800$ $\frac{P_1}{P^*}=2.093$

$P_2=\frac{P_2}{P^*}\frac{P^*}{P_1}\frac{P_1}{P_{01}}P_{01}=55.54\,kPa$

Vedi Tabella Esame

$\gamma=1.4$ $R=287$ $P_{01}=600\,kPa$ $T_{01}=350\,K$ $A_1/A_6=2.4$



$A_1/A_6 \xrightarrow{V_3} M_{V_3}=2.60 \xrightarrow{M_{V_3}} G/G^*=0.851=1/1.17$ $P_3/P_0=0.0685$ $P^*/P^*=0.265$ $P^*=1036\,kPa$ $P^*/P_0=0.259$

$M_1=0.1250$ $P/P_0=0.9957$ $P^*=173.55$ $=1/1.97$ $G/G^*=0.507$ $P/P^*=2.2064$ $P^*/P_0=0.6339$

$P_0=350$ $G_2/G_1=1.5$ Valutiamo la P_2 dentro la nozzle per M_1

$\frac{G_2}{G^*}=\frac{G_2}{G_1}\frac{G_1}{G^*}=0.761 \xrightarrow{M_2} M_2=0.624 \rightarrow P_2=331.192 < P_0$ Torniamo come sopra

$\frac{P_2}{P^*}=1.908$

$P_0=180\,kPa$ Valutiamo P_2 ~~zuppiamo~~ $M_2=1$ $\frac{G_1}{G^*}=\frac{1}{1.5}=0.666 \rightarrow$ $M_1=0.353 \xrightarrow{ISO} \frac{P}{P_{01}}=0.9174$ $\frac{P_1}{P^*}=2.044$ $\frac{A_1}{A^*}=1.765$

$\frac{P_{01}}{R}=\frac{A^*}{A_1^*}=\frac{A}{A^*}\frac{A_6}{A_1}=0.7354$ $P_2=\frac{P_2}{P^*}\frac{P^*}{P_1}\frac{P_1}{P_{01}}P_{01}=132.1 < P_0 \rightarrow$ ONDA D'URTO

$M_2 = 0.6 \xrightarrow{M_+}$ $\frac{G_2}{G^+} = 0.9049$ $\quad \frac{G_1}{G^+} = \frac{G_1}{G_2}\frac{G_2}{G^+} = 0.6032 \xrightarrow{M_+} M_1 = 0.3093$ $\quad \frac{P_1}{P_0} = 0.936$

$\frac{P_2}{P^+} = 1.596$ $\quad \frac{P_1}{P^+} = 2.117$ $\quad \frac{A_1}{A^+} = 1.98$

$\frac{P_{01}}{P_0} = \frac{P_{01}}{P_0}\frac{A^*}{A_1^*} = \frac{A^+}{A_1}\frac{A}{A_1^+} = 0.825 \rightarrow P_2 = \frac{P_2}{P^+}\frac{P^+}{P_1}\frac{P_1}{P_{01}}\frac{P_{01}}{P_0}P_0 = 232.9\ kPa$

Vedi Tab +LS

$P_0 = 100\ kPa$ Vediglio esame

$\frac{P_{01}}{P_0^+} = 0.353 \rightarrow \frac{P_{01}}{P_{02}} = 1.177 \rightarrow P_{02} = 250\ kPa$ $\quad \frac{P_0}{P_{02}} = 0.4 \rightarrow M_e = 1.22$ $\quad \nu = 4.16°$

$$\left[\frac{G_1}{G^+}\cdot\frac{A_1}{A_1^*} = \frac{P_{01}}{P_0^+}\right]$$

$P_0 = 100\ kPa$ $\quad G_2/G_1 = 1.1$

Valutiamo se P_2 devi he possiamo run t_1

$\frac{G_2}{G^+} = \frac{G_2}{G_1}\frac{G_1}{G^+} = 0.558 \rightarrow M_2 = 0.2806$ $\quad P_2 = 375.2\ kPa \Rightarrow P_0$ Mach STRozzato

$\frac{P_2}{P^+} = 2.162$

Possiamo run P_2

$M_{N_3} = 2.40$ NSW $M_1 = 0.523 \rightarrow G/G^+ = 0.851$ $\quad \frac{G_2}{G^+} = \frac{G_2}{G_1}\frac{G_1}{G^+} = 0.936 \xrightarrow{M_+} M_2 = 0.659$

$\frac{P_{01}}{R} = 0.5407$ $\quad P/P^* = 1.735$ $\quad \frac{P_2}{P^+} = 1.69$

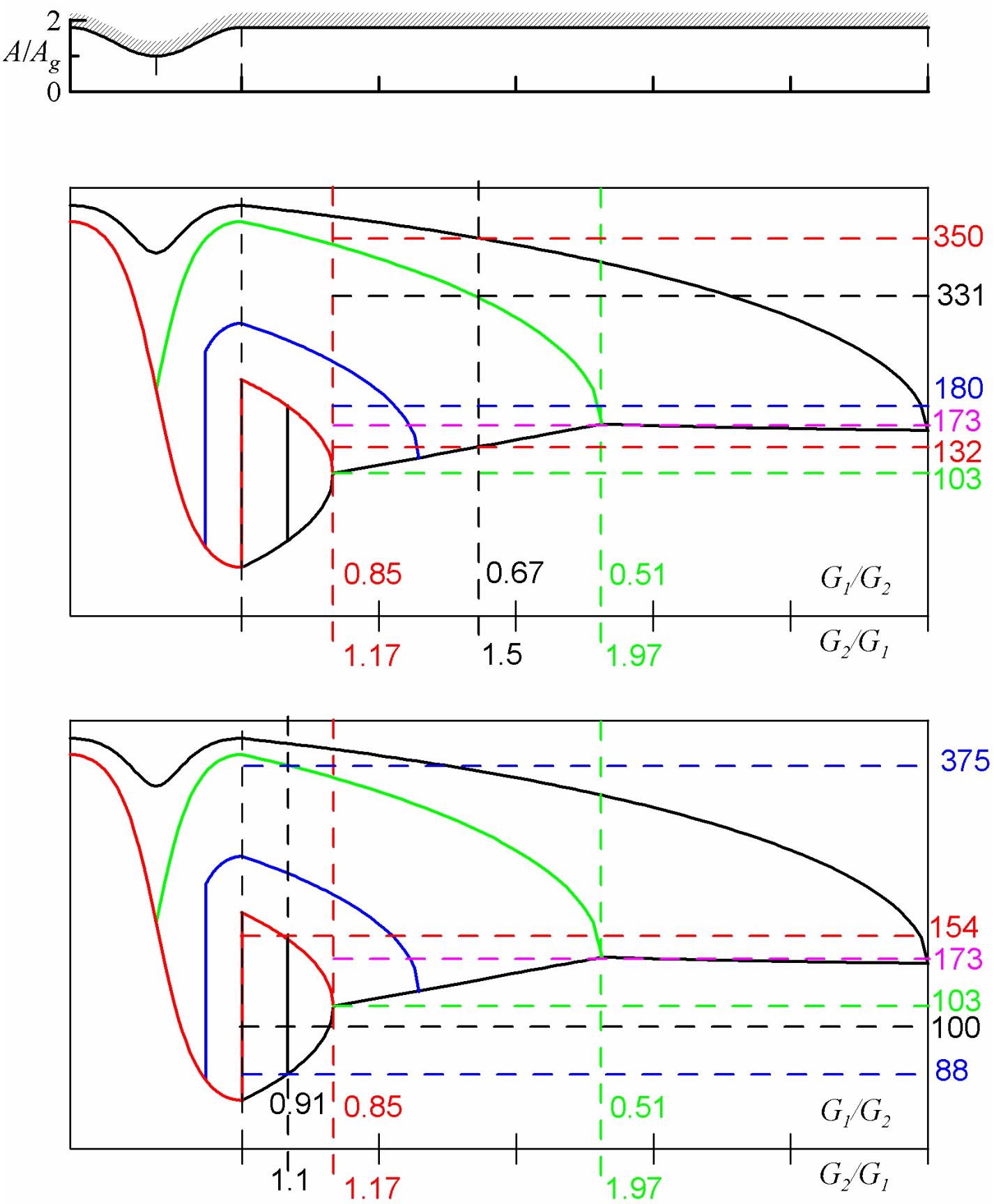
$\frac{P}{P_{01}} = 0.830$ $\quad P_2 = \frac{P_2}{P^+}\frac{P^+}{P_1}\frac{P_1}{P_{01}}\frac{P_{01}}{P_0}P_0 = 154.33 > P_0$

Possiamo run t_3

$\frac{G_2}{G^+} = \frac{G_2}{G_1}\frac{G_1}{G^+} = 0.9362 \rightarrow M_2 = 1.63$

$\frac{P_2}{P^+} = 0.1508$ $\quad P_2 = 52.5\ kPa < P_0 \rightarrow$ onda d'urto obliqua

$\frac{P_0}{P_2} = 1.90 \xrightarrow{NSW} M_{N_2} = 1.33 \rightarrow M_{N_1} = 0.77$ $\quad \varepsilon = 0.5°$ $\quad \frac{M_{n_2}}{M_2} = 54.16° \dashrightarrow$


2
A/A_g
0
350
331
180
173
132
103
0.85
0.67
0.51
G_1/G_2
1.17
1.5
1.97
G_2/G_1
375
154
173
103
100
88
0.91
0.85
0.51
G_1/G_2
1.1
1.17
1.97
G_2/G_1

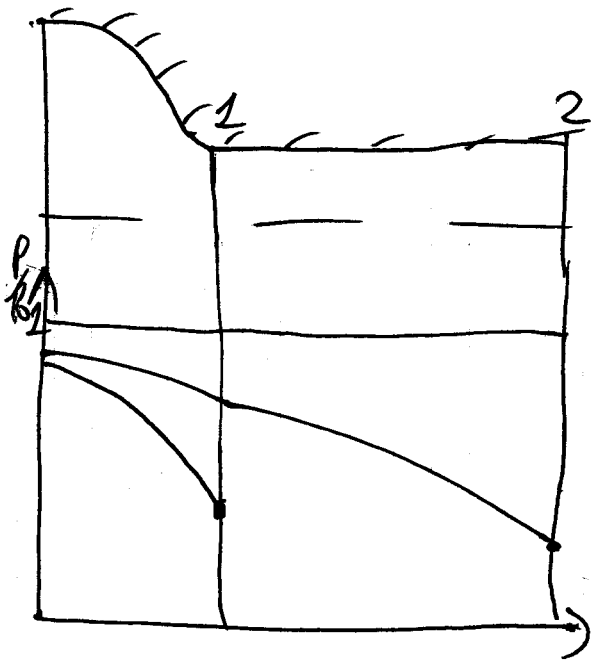
Dati									
gamma	1.4				G2/G*	0.810866			
R	287		Condizioni 1		Condizioni 2				
Po1	1.00E+06	Pa	p/po	0.957453	M	0.477471			
To1	500	K	T/To	0.987654	p/po	0.956393			
M1	0.25		p	9.57E+05	T/To	0.845353			
G2/G1	1.6	%	T	493.8272					
			T/T*	1.185185	T/T*	1.147671			
			p/p*	2.206897	p/p*	1.819325			
			po/po*	1.217672	po/po*	1.123439			
			G/G*	0.506791					
					T2	478.1963			
					p2	7.89E+05			
					po2	9.23E+05			
++++++++++++++++									
Dati									
gamma	1.4								
R	287				G2/G*	0.216185			
Po1	1.00E+06	Pa	Condizioni 1		Condizioni 2				
To1	500	K	p/po	0.843019	M	0.099955			
M1	0.5		T/To	0.952381	p/po	0.998006			
G2/G1	0.26	%	p	8.43E+05	T/To	0.833887			
			T	476.1905					
			T/T*	1.142857	T/T*	1.197607			
			p/p*	1.777778	p/p*	2.366893			
			po/po*	1.114053	po/po*	1.259153			
			G/G*	0.831479					
					T2	499.0029			
					p2	1.12E+06			
					po2	1.13E+06			
Razzo									
D	0.025								
rpunto	0.025								
rhop	2500								
gamma	1.4								
R	320								
T	3000								
L	0.3								
Agola	0.0003								
psistar	0.8101852								
port	1.4726216								
Agrano	0.0004909								
Ag/Agola	1.6362462								
Mgrano	0.3862991								
T/To	1	supponiamo che sia unitario							
To	3000		e,f						
ao	1159.3101		G/G*	0.71045					
po	7024011.8		Ge	3000					
c,d			G*	4222.675					
po/po*	1.1624713		pe/poe	0.90219					
M	0		pe	6336991					
po/po*	1.2678763		deltap	-1323910					
Poin	7660901.8								
rho	7.980106								

Ugello convergente condotto adduzione massa									
Dati									
gamma	1.4								
R	287								
Po1	125	kPa							
To1	350	K							
pa	100	kPa							
G2/G1	1.6	%							
M2	G/G*	p/p*	G1/G*	M1	p/po	p/p*	p2	Err	M2
1	1	1	0.625	0.323759	0.9299583	2.092875	55.54312	-0.44456879	0.8
0.8	0.9818086	1.265823	0.61363	0.316125	0.9330797	2.105431	70.12303	-0.2987697	0.390162
0.390162	0.7152794	1.978374	0.44705	0.216418	0.9678936	2.252313	106.2716	0.06271628	0.461268
0.461268	0.7950417	1.849177	0.496901	0.2443	0.9593201	2.21493	100.1133	0.00113345	0.462576
0.462576	0.7963512	1.846768	0.49772	0.24477	0.9591678	2.214273	99.99673	-3.2739E-05	0.46254
0.46254	0.7963145	1.846836	0.497697	0.244757	0.9591721	2.214292	100	1.2529E-08	0.46254
0.46254	0.7963146	1.846836	0.497697	0.244757	0.9591721	2.214292	100	1.3799E-13	0.46254
0.46254	0.7963146	1.846836	0.497697	0.244757	0.9591721	2.214292	100	-4.2633E-16	0.46254

Ugello convergente-divergente											
Dati											
gamma	1.4										
R	287										
Po1	400										
To1	350										
		kPa									
A/A*	2.4										
Sup		Sub									
M	2.3985993	M	0.250305								
G/G*	0.85112819	G/G*	0.507317								
p/po	0.06854912	p/po	0.957352								
p/p*	0.26505893	p/p*	2.206463								
p*/po	0.2586184	p*/po	0.433885								
p*	103.44736	p*	173.5541								
Dati											
pa	350	kPa									
G2/G1	1.5	G1/G2	0.666667								
Supponedo di passare per r1 si ha							1.217561	1.23459588			
G2/G*	M2	p/p*	p2				1.013991				
0.7609757	0.42900946	1.908293	331.192	minore pa moto non strozzato							
M2	G/G*	p/p*	G1/G*	M1	p/po	p/p*	p2	Err	M2		
0.4290095	0.76097566	1.908293	0.507317	0.250305	0.9573519	2.206463	331.192	-0.05373712	0.2		
0.2	0.41659779	2.272727	0.277732	0.129527	0.988344	2.344922	383.1661	0.0947602	0.346137		
0.3461372	0.6571529	2.05526	0.438102	0.211549	0.9692935	2.258495	352.8279	0.00807967	0.359759		
0.3597589	0.67586389	2.031837	0.450576	0.218347	0.9673308	2.249833	349.4407	-0.00159788	0.35751		
0.3575098	0.67281941	2.035729	0.448546	0.217236	0.9676555	2.251263	350.0052	1.4914E-05	0.357531		
0.3575306	0.67284765	2.035694	0.448565	0.217246	0.9676525	2.25125	350	2.65E-08	0.357531		
0.3575307	0.6728477	2.035693	0.448565	0.217246	0.9676525	2.25125	350	-4.4289E-13	0.357531		
0.3575307	0.6728477	2.035693	0.448565	0.217246	0.9676525	2.25125	350	-1.6241E-16	0.357531		
Dati											
pa	180	kPa									
G2/G1	1.5	G1/G2	0.666667								
Supponedo di passare per r1 si ha											
G2/G*	M2	p/p*	p2								
0.7609757	0.42900946	1.908293	331.192	maggiore pa moto strozzato							
Supponendo M2 =1 ond d'urto											
M2	G1/G*	M1	p/po	A/A*	po1/po	p/p*	p2				
1	0.66666667	0.353004	0.917448	1.76502	0.7354249	2.043498	132.0704	< pa ond d'urto			
M2	G/G*	p/p*	G1/G*	M1	p/po	A/A*	po1/po	p/p*	p2	Err	M2

1	1	1	0.666667	0.353004	0.9174483	1.76502	0.735425	2.04349839	132.0704	-0.266275295	0.429009
0.4290095	0.76097566	1.908293	0.507317	0.250305	0.9573519	2.4	1	2.20646323	331.192	0.8399556	0.86256
0.8625597	0.99210797	1.175541	0.661405	0.349192	0.9191277	1.781494	0.742289	2.05004014	156.4893	-0.13061524	0.804214
0.8042144	0.98266651	1.259535	0.655111	0.344679	0.9210971	1.801511	0.75063	2.0577457	169.2816	-0.059546721	0.755328
0.7553282	0.97107658	1.334276	0.647384	0.339208	0.9234574	1.826557	0.761065	2.06702914	181.467	0.0081501	0.761214
0.7612136	0.97266972	1.32507	0.648446	0.339955	0.9231367	1.823082	0.759618	2.06576435	179.9199	-0.000445076	0.760909
0.7609089	0.97258861	1.325546	0.648392	0.339917	0.923153	1.823259	0.759691	2.06582882	179.9994	-3.15906E-06	0.760907
0.7609067	0.97258803	1.325549	0.648392	0.339917	0.9231531	1.82326	0.759692	2.06582928	180	1.23306E-09	0.760907
Dati											
pa	100	kPa									
G2/G1	1.5	G1/G2	0.666667								
Supponedo di passare per r1 si ha											
G2/G*	M2	p/p*	p2								
0.7609757	0.42900946	1.908293	331.192	maggiore pa moto strozzato							
Supponendo M2 =1											
M2	G1/G*	M1	p/po	A/A*	po1/po	p/p*	p2		po1/po2=po1/po*		
1	0.66666667	0.353004	0.917448	1.76502	0.7354249	2.043498	132.0704	>pa ventaglio	1.17668		
po2	pa/po2	Ma	ni								
250	0.4	1.22324	4.139316		1.1766799						
Dati											
pa	100	kPa									
G2/G1	1.1	G1/G2	0.909091								
Supponedo di passare per r1 si ha											
G2/G*	M2	p/p*	p2								
0.5580488	0.28058765	2.161731	375.1773	maggiore pa moto strozzato							
Supponedo di passare per r2 si ha											
M1	po1/po	G/G*	p/po1	p/p*	G2/G*	M2	p/p*	p2			
0.5232674	0.54073497	0.851128	0.829774	1.734941	0.936241	0.659375	1.491902	154.333308			
Supponedo di passare per r3 si ha											
G2/G*	M2	p/p*	p2								
0.936241	1.63084045	0.508098	52.56141	minore pa onda d'urto obliqua							
pa/p2	Mn2	Mnv	eps								
1.9025364	1.33176673	0.770314	54.74724								

Moto con addizione di Massa



$P_2 = 70\,kPa$

$\gamma = 1.4 \quad R = 287 \frac{J}{kg\,K} \quad P_0 = 100\,kPa$

$D_1 = D_2 = 0.05\,m \quad T_0 = 350\,K$

Considerando solo l'ugello per moto stazionario:

$$\dot{m} = \frac{P_0 A_1 \Psi^+}{Q_0} \Rightarrow G_u^* = \frac{\dot{m}}{A_1} = \frac{P_0 \Psi^+}{Q_0} =$$

$$G_u^+ = \frac{100 \cdot 0.81 \cdot 10^3}{\sqrt{1.4 \cdot 287\,350}} = 0,216 \frac{kg}{m^2 s}$$

Supponiamo che la massa aggiunta sia il 20% di G_u^+

$$\Delta G = G_u^+ \cdot 0.2 = 0.0432 \frac{kg}{m^2 s}$$

Si procede per tentativi: Supponiamo $M_1 = 0,2$

$M_1 = 0,2 \xrightarrow{M_1} P_1/p^+ = 2,27$

$\downarrow$ Iso $\quad \frac{G_1}{G^+} = 0417$

$\frac{P}{P_{01}} = 0,973$

$\frac{A_1}{A_1^*} = 2,96 \longrightarrow G_1 = G_u^+ \frac{A_1^*}{A_1} = \frac{0,216}{2.96} = 0.0729 \frac{kg}{m^2 s} \quad \frac{\Delta G}{G_1} = 0,593$

$\frac{G_2}{G_1} = \frac{\Delta G + G_1}{G_1} = 1 + \frac{\Delta G}{G_1} = 1.593 \rightarrow \frac{G_2}{G^+} = \frac{G_2}{G_1}\frac{G_1}{G^+} = 1.59 \cdot 0,417 = 0,664$

$\frac{G_2}{G^+} = 0.664 \xrightarrow{M_2} M_2 = 0,351 \quad P_2 = \frac{P_2}{p^+}\frac{p^+}{P_1}\frac{P_1}{P_{01}}P_{01} = \frac{2.05}{2.27} \cdot 0,973 \cdot 100 = 87.6$

$\frac{P_2}{p^+} = 2.05$

$M_1 = 0,25 \xrightarrow{M_1} P_1/p^+ = 2.21 \quad G_1/G^+ = 0,507$

$\downarrow$ Iso

$\frac{P_1}{P_{01}} = 0.973 \quad \frac{A_1}{A^+} = 2.40 \quad G_1 = 0,0899 \quad \frac{\Delta G}{G_1} = 0,481$ ....

$\frac{G_2}{G_1} = 1.48 \quad \frac{G_2}{G^+} = 0,750 \xrightarrow{M_2} M_2 = 0,420 \quad P_2 = 83,54$

$\frac{P_2}{p^+} = 1.93$

Vedi tab.

Se si suppone $M_2 = 0,4 \rightarrow \frac{p_2^0}{p^*} = 1,96$

$$\frac{G_2}{G^*} = 0,727$$

Si suppone $G_1 = Q \cdot G_1^*$ con $Q = 0,3$ $\frac{\Delta G}{G_1} = \frac{0,432}{0,3 \cdot 0,26} = 0,667$

$\frac{G_2}{G_1} = 1,67$ $\frac{G_1}{G^*} = \frac{G_1}{G_2} \cdot \frac{G_2}{G^*} = \frac{0,724}{1,67} = 0,436 \rightarrow$ $M_1 = 0,21$ $\frac{p_1}{p_{t1}} = 0,970$

$\frac{p_1}{p^*} = 2,26$ $\frac{A_y}{A^*} = 2,82$

$G_1 = G_1^* \frac{A_1^*}{A_1} = \frac{0,216}{2,82} = 0,766 \frac{kg}{m^2 s}$ $Q = \frac{G_1}{G_1^*} = \frac{A_1^*}{A_1} = \frac{1}{2,52} = 0,354$

Si itera con $Q = 0,4$ (Vedi Tab)

Dopo 3 iterazioni si trova $Q = 0,395$ e $M_1 = 0,236$ $\frac{p_1}{p_{t1}} = 0,962$

$\frac{p_1}{p^*} = 2,13$

$p_2 = 84,7$

Altre iterazioni con $M_2 = 0,3$ $p_0 = 90$

Vedi Tab

gamma	1.4			pa	70	kPa											
R	287			G* ugello	0.216												
Po1	100	kPa		perc DG	20%												
To1	350	K		DeltaG	0.0432												
D	0.05	m		A1	0.00196												
M1	p1/p*	G1/G*	p1/p01	Au/A*	G1	DG/G1	G2/G1	G2/G*	**M2**	p2/p*	p2	**Err**					
0.2	2.27273	0.4166	0.9725	2.96352	0.07289	0.5927	1.5927	0.66352	**0.35072**	2.04743	87.609	**17.609**	0.25				
0.25	2.2069	0.50679	0.95745	2.40271	0.0899	0.48054	1.48054	0.75033	**0.41955**	1.9255	83.5368	**13.5368**	0.41621				
0.41621	1.93155	0.74649	0.88762	1.53999	0.14026	0.308	1.308	0.97641	**0.77593**	1.30229	59.8454	**-10.155**	0.34497				
0.34497	2.05725	0.65552	0.92097	1.8002	0.11998	0.36004	1.36004	0.89153	**0.57858**	1.63414	73.1557	**3.15565**	0.36186				
0.36186	2.02819	0.67869	0.91349	1.72821	0.12498	0.34564	1.34564	0.91328	**0.61435**	1.57028	70.7248	**0.72483**	0.3669				
0.3669	2.01942	0.68541	0.91121	1.70815	0.12645	0.34163	1.34163	0.91956	**0.6258**	1.55012	69.9448	**-0.0552**	0.36654				
0.36654	2.02005	0.68494	0.91137	1.70955	0.12635	0.34191	1.34191	0.91912	**0.62497**	1.55156	70.0009	**0.00095**	0.36655				
0.36655	2.02003	0.68494	0.91137	1.70953	0.12635	0.34191	1.34191	0.91913	**0.62499**	1.55154	70	**1.2E-06**	0.36655				
0.36655	2.02003	0.68494	0.91137	1.70953	0.12635	0.34191	1.34191	0.91913	**0.62499**	1.55154	70	**-3E-11**	0.36655				
0.36655	2.02003	0.68494	0.91137	1.70953	0.12635	0.34191	1.34191	0.91913	**0.62499**	1.55154	70	**0**	0.36655				
M2	p2/p*	G2/G*	%G1	DG/G1	G2/G1	G1/G*	**M1**	p1/p*	p1/p01	Au/A*	G1	%G1	**Err**	%G1	p2	**Err**	M1
0.4	1.96078	0.72734	0.3	0.66667	1.66667	0.43641	**0.21063**	2.25965	0.96955	2.82127	0.07656	0.35445	**0.05445**	0.35			
0.4	1.96078	0.72734	0.35	0.57143	1.57143	0.46285	**0.22511**	2.24101	0.96532	2.64968	0.08152	0.3774	**0.0274**	0.40066			
0.4	1.96078	0.72734	0.40066	0.49917	1.49917	0.48516	**0.23761**	2.22419	0.96146	2.51895	0.08575	0.39699	**-0.0037**	0.39468			
0.4	1.96078	0.72734	0.39468	0.50674	1.50674	0.48273	**0.23623**	2.22608	0.9619	2.53267	0.08528	0.39484	**0.00016**	0.39493	84.7262	**14.7262**	0.3
0.3	2.13144	0.58895	0.39493	0.50642	1.50642	0.39096	**0.18649**	2.28857	0.97603	3.16835	0.06817	0.31562	**-0.0793**	0.39468			
0.3	2.13144	0.58895	0.39468	0.50674	1.50674	0.39088	**0.18645**	2.28862	0.97604	3.16907	0.06816	0.31555	**-0.0791**	0.28449			
0.3	2.13144	0.58895	0.28449	0.703	1.703	0.34583	**0.16331**	2.31362	0.98155	3.60066	0.05999	0.27773	**-0.0068**	0.27419			
0.3	2.13144	0.58895	0.27419	0.72942	1.72942	0.34055	**0.16064**	2.31632	0.98214	3.65857	0.05904	0.27333	**-0.0009**	0.27269	90.3753	**20.3753**	0.66068
0.66068	1.48967	0.93684	0.27269	0.73343	1.73343	0.54045	**0.26988**	2.17792	0.95064	2.23941	0.09645	0.44655	**0.17386**	0.27418			
0.66068	1.48967	0.93684	0.27418	0.72944	1.72944	0.5417	**0.27063**	2.1768	0.95038	2.23372	0.0967	0.44768	**0.1735**	1.00134			
0.66068	1.48967	0.93684	1.00134	0.19973	1.19973	0.78087	**0.44745**	1.87457	0.87161	1.45501	0.14845	0.68728	**-0.3141**	0.53295			
0.66068	1.48967	0.93684	0.53295	0.37527	1.37527	0.6812	**0.36373**	2.02493	0.91265	1.72067	0.12553	0.58117	**0.04822**	0.59529	67.1399	**-2.8601**	0.61628
0.61628	1.56686	0.91436	0.59529	0.33597	1.33597	0.68442	**0.36615**	2.02073	0.91155	1.71109	0.12623	0.58442	**-0.0109**	0.58383			
0.61628	1.56686	0.91436	0.58383	0.34257	1.34257	0.68105	**0.36362**	2.02513	0.9127	1.72112	0.1255	0.58102	**-0.0028**	0.57983			
0.61628	1.56686	0.91436	0.57983	0.34493	1.34493	0.67986	**0.36273**	2.02668	0.9131	1.7247	0.12524	0.57981	**-2E-05**	0.5798			
0.61628	1.56686	0.91436	0.5798	0.34495	1.34495	0.67985	**0.36272**	2.02669	0.9131	1.72473	0.12523	0.5798	**-4E-08**	0.5798	70.593	**0.59302**	0.62391
0.62391	1.55343	0.91855	0.5798	0.34495	1.34495	0.68296	**0.36506**	2.02263	0.91205	1.71541	0.12591	0.58295	**0.00315**	0.5798			
0.62391	1.55343	0.91855	0.5798	0.34495	1.34495	0.68296	**0.36506**	2.02263	0.91205	1.71541	0.12591	0.58295	**0.00315**	0.58434			
0.62391	1.55343	0.91855	0.58434	0.34227	1.34227	0.68433	**0.36608**	2.02085	0.91158	1.71136	0.12621	0.58433	**-7E-06**	0.58433			
0.62391	1.55343	0.91855	0.58433	0.34227	1.34227	0.68432	**0.36608**	2.02085	0.91158	1.71137	0.12621	0.58433	**1.6E-08**	0.58433	70.0735	**0.0735**	0.62499
0.62499	1.55154	0.91913	0.58433	0.34227	1.34227	0.68476	**0.3664**	2.02028	0.91143	1.71008	0.12631	0.58477	**0.00044**	0.58433			
0.62499	1.55154	0.91913	0.58433	0.34227	1.34227	0.68476	**0.3664**	2.02028	0.91143	1.71008	0.12631	0.58477	**0.00044**	0.58496			
0.62499	1.55154	0.91913	0.58496	0.34191	1.34191	0.68494	**0.36655**	2.02003	0.91137	1.70953	0.12635	0.58496	**-1E-07**	0.58496			
0.62499	1.55154	0.91913	0.58496	0.34191	1.34191	0.68494	**0.36655**	2.02003	0.91137	1.70953	0.12635	0.58496	**4.3E-11**	0.58496	70	**-1E-05**	0.62499