



دانشگاه صنعتی شاهرود  
سازمان مهندسی



انجمن مهندسی  
ساخت و تولید ایران

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*Shh\_research@yahoo.com*

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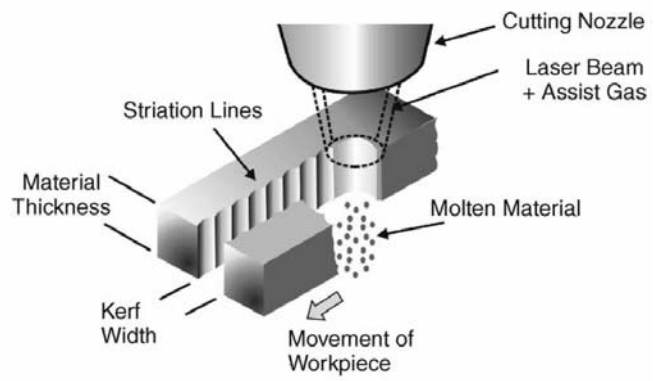
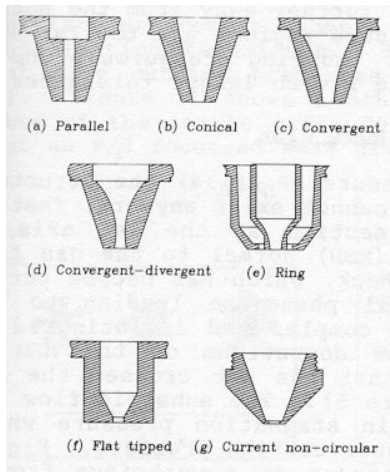
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[1]

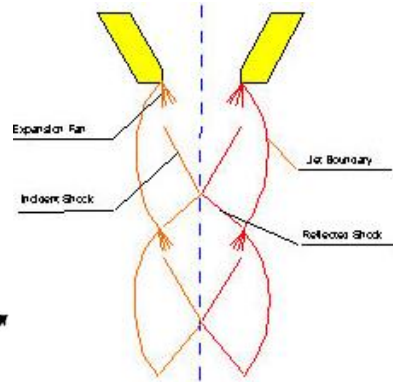
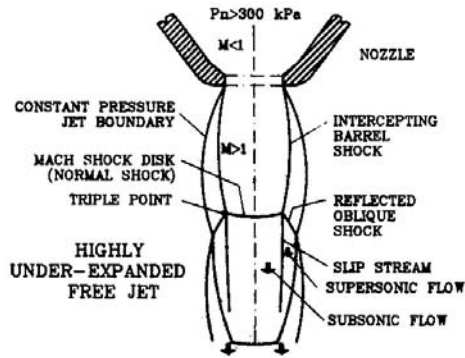
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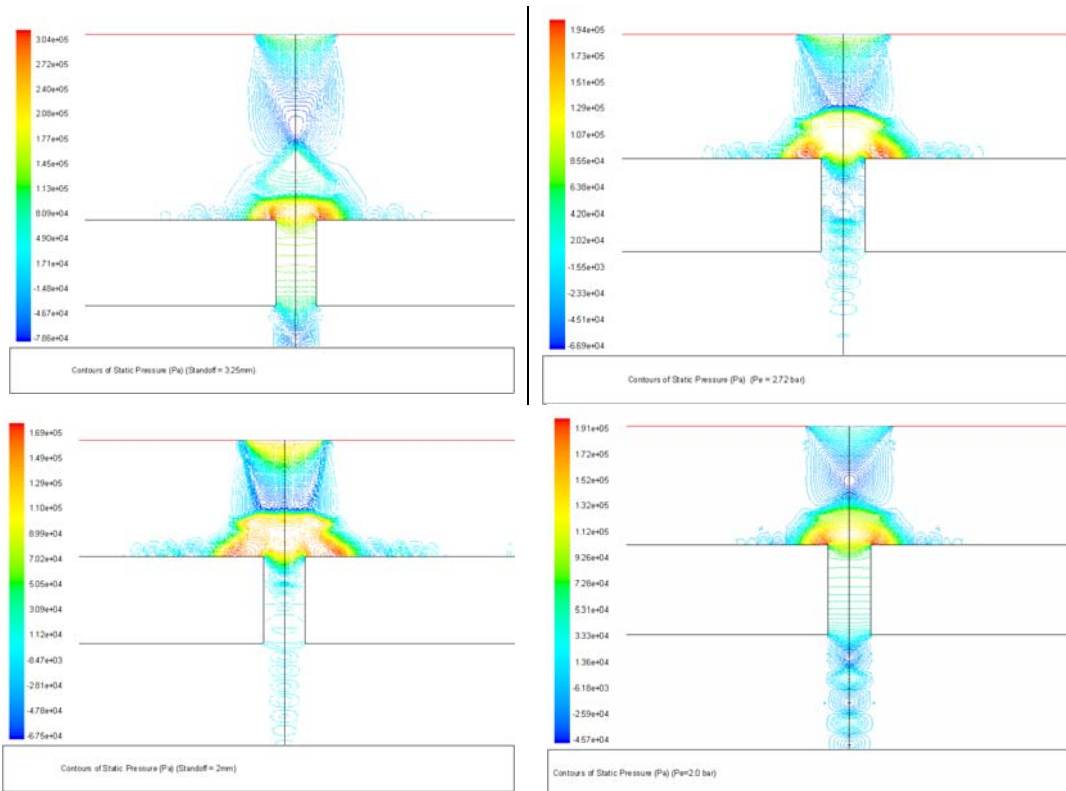


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دانشگاه سوادکوه  
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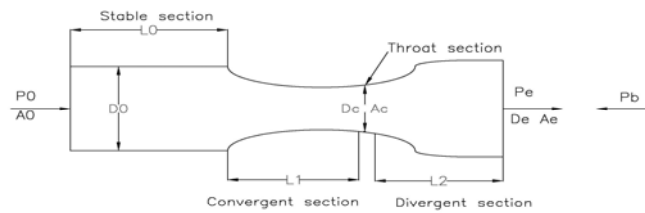
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[5]



$D_0$

$$D_0 = \sqrt{5} D_c \quad ( )$$

$L_0$

$D_c$

$$\left(\frac{A_0}{A_c}\right)$$

$$\frac{A_0}{A_c} = \frac{M_c}{M_0} \left( \frac{1 + \frac{k-1}{2} M_0^2}{1 + \frac{k-1}{2} M_c^2} \right)^{\frac{k+1}{2(k-1)}} \quad ( )$$

$M_c$

$M_0$

$$R = \frac{R_c}{\sqrt{1 - \left[1 - \left(\frac{R_c}{R_0}\right)^2\right] \frac{(1-a^2)}{\left(1 + \frac{a^2}{3}\right)^3}}} \quad ( )$$

$$a = \frac{x}{L_1}$$

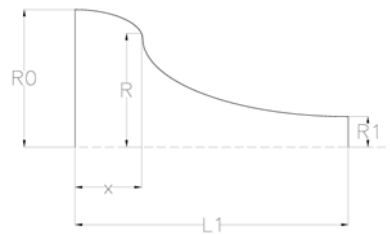
$R_0$

$R_c$

$R$

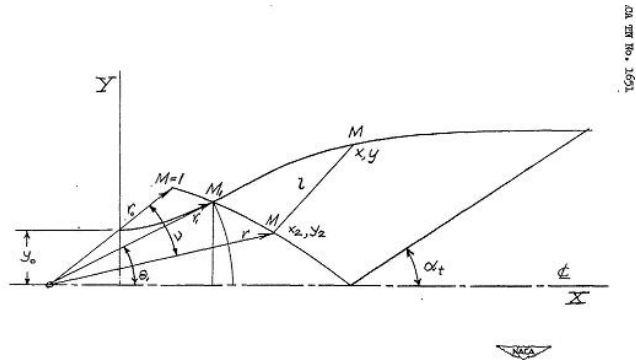
x

$L_1$  (



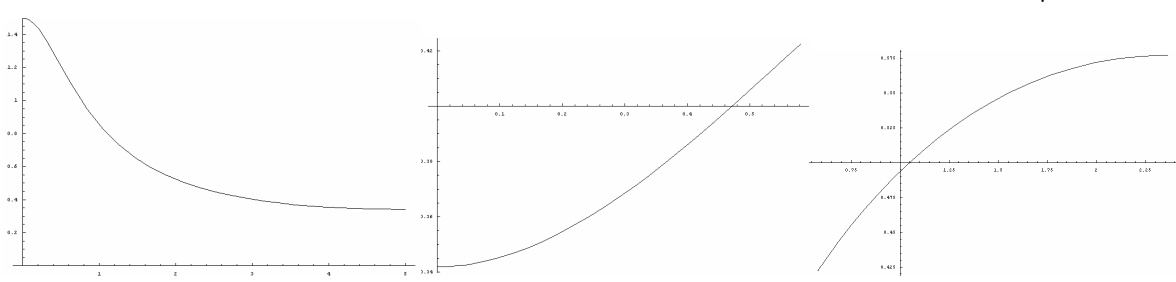
<sup>1</sup> NASA( Old name:NACA)



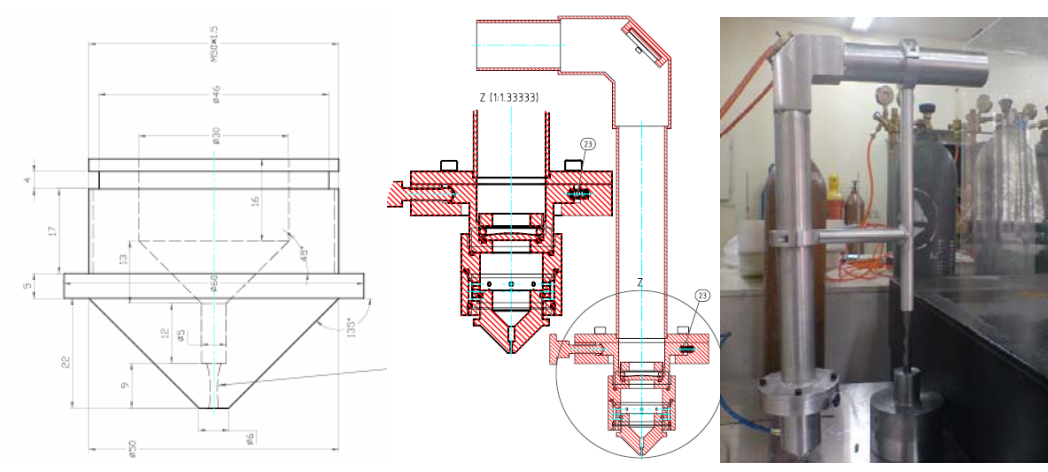


Mathematica

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[8].





در نازل های مافوق صوت جریان خروجی shock free بوده و بدلیل سرعت بالای جریان گاز خروجی ، از ممنوم بالایی برخوردار هستند.

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