

\bar{C}_∞	Species concentration in the free stream	$\frac{Kmol}{m^3}$		expansion for mass transfer	$\frac{1}{Kmol}$
D_M	Co-efficient of chemical molecular mass diffusivity	$m^2 s^{-1}$		ν Kinematic viscosity	m^2 / s
D_T	Co-efficient of chemical thermal diffusivity	$\frac{Kmol}{m K s}$		ρ Fluid density	kg / m^3
Du	Dufour number	-		θ Non dimensional temperature	$K \text{ or } ^\circ C$
Gr	Grashof number for heat transfer	-		θ_r, θ_i The real and imaginary parts of θ	-
Gm	Grashof number for mass transfer	-		ϕ Non dimensional chemical species concentration	-
g	Acceleration due to gravity	m/s^2		ϕ_r, ϕ_i The real and imaginary parts of ϕ	-
K_T	Thermal Diffusion ratio	$\frac{Kmol}{m K s}$		ω Frequency parameter	H_z
k	Thermal conductivity	$\frac{W}{mK}$		ε Amplitude of the suction velocity	ms^{-1}
Pr	Prandtl number	-		τ Coefficient of skin friction at the plate	-
\bar{p}	Pressure	Pa (Pascal)		τ_r, τ_i The real and imaginary parts of τ	-
p	Non dimensional pressure	-			
p_∞	Non dimensional pressure in the free stream	-			
Re	Suction Reynolds number	-			
Sc	Schmidt number	-			
Sr	Soret number	-			
\bar{T}	Temperature in the boundary layer	$K \text{ or } ^\circ C$			
T_M	Mean fluid temperature	$K \text{ or } ^\circ C$			
\bar{T}_∞	Temperature in the free stream	$K \text{ or } ^\circ C$			
\bar{t}	Time	s (second)			
t	Non dimensional time	-			
\bar{U}	Free stream velocity	m/s			
U	Non dimensional free stream velocity	-			
$(\bar{u}, \bar{v}, \bar{w})$	Components of the fluid velocity	m/s			
(u, v, w)	Non dimensional components of the fluid velocity-				
u_r, u_i	The real and imaginary parts of u				
Nu	Nusselt number at the plate	-			
Nu_r, Nu_i	The real and imaginary parts of Nu	-			
Sh	Sherwood number at the plate	-			
Sh_r, Sh_i	The real and imaginary parts of Sh .	-			
Greek Symbols	Quantity	SI unit			
β	Coefficient volume expansion for heat transfer	K^{-1}			
$\bar{\beta}$	Co-efficient of volume				

12. REFERENCES

- G. V. Lachmann (Ed.), *Boundary Layer and Flow Control*, Vol. I and II, Pergamon Press, London, 1961.
- A.Raptis, and N.G.Kafousias, Magneto hydrodynamic free convective flow and mass transfer through a porous medium bounded by an infinite vertical porous plate with constant heat flux, *Can. J. Phys.*, **60**, 1725-1729, 1982.
- A.Bejan and K.R. Khair, Heat and mass transfer in a porous medium, *Int. J. Heat Transfer*, **28**, 902-918, 1985.
- N.Ahmed, D.Sarma, and K. Sarma, MHD free and forced convective flow and mass transfer through a porous medium, *Far East J.Appl.Math.*, **21(3)**, 271-281, 2005.
- R.C.Choudhary and T.Chand, Three dimensional flow and heat transfer through porous medium, *Int. J. Appl. Mech. Engineering*, **7(4)**, 1141-1156, 2002.
- N.Ahmed and D.Sarma, Three-dimensional Free Convective Flow and Heat Transfer through a Porous Medium, *Indian J. Pure and Appl. Math.*, **28(10)**, 1345-1353, 1997.
- P.Singh, and J. K. Misra, Three Dimensional Convective Flow and Heat Transfer in a Porous Medium, *Indian J. Pure and Appl. Math.*, **19 (11)**, 1130-1135, 1988.
- N. C. Jain and P.Gupta, Three Dimensional Free Convection Couette Flow with Transpiration Cooling, *Journal of Zhejiang University SCIENCE A*, **7(3)**, 340-346, 2006.
- N.Ahmed., D.Sarma, and D.P.Barua, Three dimensional free convective flow and mass transfer along a porous plate, *BAMS*, **21**, 125-141, 2006.
- M.A. Sattar and M.M.Alam, Thermal-diffusion as well as effects on MHD free convection and mass transfer flow past an accelerated vertical porous plate, *Indian J. pure appl. Math.*, **25(6)**, 679-688, 1994.
- N. P Singh, Atul Kumar Singh and Ajay Kumar Singh, MHD free convection MHD mass transfer flow part of flat plate, *The Arabian Journal for Science and Engineering*, **32 (1A)**, 93-112, 2007.
- M.C.Raju, S.V.K.Varma, P.V.Reddy, and S.Saha, Soret effects due to natural convection between heated inclined plates with magnetic field, *Journal of Mechanical Engineering*, **39(2)**, 65-70, 2008.
- N. Ahmed and H.K Sarmah, Effect of thermal diffusion on a three dimensional MHD mixed convection with mass transfer flow past a vertical plate, *Journal of energy, heat and mass transfer*, **32**, 199-221, 2010.

14. N.Ahmed and J.K.Goswami, Effect of thermal diffusion on an oscillatory three dimensional flow with mass transfer past an infinite vertical porous plate in presence of heat sink, *Int.J.of Appl.Math and Mech.*, **7(4)**: 29-52, 2011.
15. R.G.Mortimer and H.Eyring, Elementary transition state theory of the Soret and Dufour effects, *Proc. Natl. Acad. Sci. USA*, **77(4)**, 1728-1731, 1980.
16. M. S.Alam, M. M. Rahman, and M. A. Samad, Dufour and Soret effects on unsteady free convection and mass transfer flow past a vertical porous plate in a porous medium, *Nonlinear Analysis: Modelling and control*, **11 (3)**, 217-226, 2006.
17. M. S.Alam, and M. M.Rahman, Dufour and Soret effects on mixed convection flow past a vertical porous flat plate with variable suction, *Nonlinear Analysis: Modelling and control*,**11(1)**, 3-12, 2006.
18. M.Ferdows, M.Ota, M.S.Alam and M.A.Maleque, Dufour and Soret effects on steady free convection and mass transfer flow past a semi-infinite vertical plate in a porous medium, *Int. J. of Applied Mechanics and Engineering*, **11(3)**, 535-545, 2006.
19. S.S. Motsa, On the onset of convection in a porous layer in the presence of Dufour and Soret effects, *SJPAM*, **3**, 58-65, 2008.
20. P.S.Reddy and D.R.V.P.Rao, Combined influence of Soret and Dufour effects on convective heat and mass transfer flow through a porous medium in cylindrical annulus with heat sources, *African Journal of Mathematics and Computer Science Research*, **3 (10)**,237-254, 2010.
21. M.N.R.Shekar and J.V.Madhu, Effects of Dufour and Soret on steady MHD mixed convection flow past a vertical porous flat plate with variable suction, *International J.of Multidispl, Research & Advcs. in Eng. (IJMRAE)*, **3(II)**, 35-44, 2011.
22. G.Lorenzini, L.A.O.Rocha, C.Biserni, E.D.Dos Santos and L.A.Isoldi,Constructal design of cavities inserted into a cylindrical solid body, *ASME Journal of Heat Transfer*, **134(7)**, 071301 1 -1 6, 2012.
23. G.Lorenzini, C.Biserni, F.L.Garcia,and L.A.O.Rocha, Geometric optimization of a convective T-shaped cavity on the basis of constructal theory, *International Journal of Heat and Mass Transfer*, **55(23-24)**, 6951-6958, 2012.