



# READ.ME.txt

Variable Format	Identity	
fr d10.5	Experimental flow rate(lit/min)	Blank Space 10x
areabase d10.5	Loss in Filtration area factor from filter database	Blank Space 10x
viisc d10.5	viscosity value of fluid used in experiment (Pa.s)	Blank Space 10x

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 ---  
 Line (3 + ntd)

Variable Format	Identity	
xab g22.12	x-coordinate of centre for the first curved region in the cartridge domain (mm)	Blank Space 5x
yab g22.12	y-coordinate of centre for the first curved region in the cartridge domain (mm)	

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 Line (4 + ntd)

Variable Format	Identity	
xjk1 g22.12	x-coordinate of centre for the second curved region in the cartridge domain (mm)	Blank Space 5x
yjk1 g22.12	y-coordinate of centre for the second curved region in the cartridge domain (mm)	

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 Line (5 + ntd)

Variable Format	Identity	
xfgfd g22.12	x-coordinate of centre for the third curved region in the cartridge domain (mm)	Blank Space 5x
yfgfd g22.12	y-coordinate of centre for the third curve region in the cartridge domain (mm)	

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 ----  
 Line (6 + ntd)

Variable Format	Identity	
		Blank Space 5x

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                                READ.ME.txt
    xldkdjd      x-coordinate of centre for the fourth curved
g22.12
                                region in the cartridge domain (mm)
    yldkdjd      y-coordinate of centre for the fourth curved
g22.12
                                region in the cartridge domain (mm)
-----
----
Line (7 + ntd)
    variable      Identity
Format
                                Blank Space
    xadbd      x-coordinate of centre for the fifth curved      5x
g22.12
                                region in the cartridge domain (mm)
    yadbd      y-coordinate of centre for the fifth curved
g22.12
                                region in the cartridge domain (mm)
-----
----
Line (8 + ntd)
    variable      Identity
Format
                                Blank Space
    enp      Total number of pleats in cartridge      5x
f10.5
-----
----
Line (9 + ntd)
    variable      Identity
Format
                                Blank Space
    hp      Height of cartridge filter element (mm)      5x
f10.5
-----
----
Line (10 + ntd)
    variable      Identity
Format
                                Blank Space
    el      Length of the pleat (mm)      5x
f10.5
-----
----
Line (11 + ntd)
    variable      Identity
Format
                                Blank Space
    di      Diameter of inner core of the cartridge (mm)      5x
f10.5
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End of file

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## READ.ME.txt

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### INPUT FILE FORMAT

- An input text file ( "DF.dat" ).

It reads the geometrical data of finite element mesh including number of nodes and elements, number of boundary conditions and nodal connectivity of the elements. It also reads the physical properties of fluid and tolerance values for velocity and pressure variations.

The format of the input file are as follows:

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----  
Line 1

Variable	Identity
Title	Reads Title of the program

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Line 2

Variable	Identity
ncn	Number of nodes associated with each element
ngaus	Number of quadrature points for Gauss integarion

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----  
Line 3

Variable	Identity
nnp	Number of nodal points in cartridge mesh
nel	Number of elements in cartridge mesh
nbc	Number of imposed boundary condition
nmat	Number of fluid mediums used

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Line 4

Variable	Identity
ntep	Count parameter for printing results of each iteration
icord	Switch for selecting the coordinate systems

READ.ME.txt  
for the equations

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Line 5

Format	Variable	Identity	
	tolv	Tolerance value for discrepancy in velocity values obtained in two successive iterations	i5
	tolp	Tolerance value for discrepancy in pressure values obtained in two successive iterations	i5

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Line 6

Format	Variable	Identity
d10.5	rvisc	Consistency coefficient or viscosity of fluid values obtained in two successive iterations
d10.5	power	Power law index for calculating the viscosity of fluid by power law model
d10.5	tref	Reference temperature
d10.5	tbco	Coefficient b in power law model
d10.5	taco	Coefficient a in power law model
d10.5	dispc	Dispersion coefficient
d10.5	pref	Reference pressure
d10.5	roden	Density of fluid
d10.5	gamad	rate of deformation of viscous stress tensor

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Line 7, Line 8, ....., Line (6 + nel)

Format	Variable	Identity	
	iel	element number	i8
	node	Nodal connctivity i.e. node numbers associated with element "iel"	9i8

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End of file  
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## READ.ME.txt

### OUTPUT FILE FORMAT

- An output text file to print the values in excel format( excel.txt ).

The format of the output file are as follows:

-----			
Line 1			
Variable	Identity		
Format			
text	Blank Space		20x
-----			
Line 2			
Variable	Identity		
Format			
text	Blank Space		20x
-----			
Line 3			
Variable	Identity		
Format			
text	Blank Space		20x
-----			
Line 4, Line 5, Line 6			
Blank Lines			
-----			
Line 7			
Variable	Identity		
Format			
text	Blank Space		25x
f10.4	Filtering area of cartridge (m^2)		
farea	Filtering area of the pleated cartridge		
-----			
Line 8			
Variable	Identity		
Format			
	Blank Space		25x

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                                READ.ME.txt
text          "Number of pleats"          ="
enp          Total number of pleats in filter cartridge
f10.4
-----
Line 9
Variable          Identity
Format
text          "Height of the Filter Element" (mm)          ="          25x
hp          Height of the filter cartridge element
f10.4
-----
Line 10
Variable          Identity
Format
text          "Length of the pleat" (mm)          ="          25x
e1          Length of the pleat
f10.4
-----
Line 11
Variable          Identity
Format
text          "Diameter of the cartridge" (mm)          ="          25x
di          Diameter of the inner core of the cartridge
f10.4
-----
Line 12
Variable          Identity
Format
text          "Hydraulic fluid density" (kg/m^3)          ="          25x
density          Density of the hydraulic fluid
f10.4
-----
Line 13
Variable          Identity
Format
text          " Flow Rate(lit/min)          Viscosity(Pa.s)          Pressure
exp(Bar)          Pressure (Bar)          Pressure com(Bar)          Pressure
                                Page 7

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# READ.ME.txt

com + area(Bar)

% Compression

%Loss in area "

Line 14, Line 15, ....., Line (13 + ntd)

Variable	Identity	
Format		
e15.4 fr	Experimental flow rate	
e15.4 viisc	viscsoity of fluid used in experiemnsts	25x
e15.4 pd	Experiemntal pressure drop value	25x
e15.4 excel(1)	Simulated pressure drop with no compression	25x
e15.4 excel(2)	Simulated pressure drop with compression	25x
e15.4 excel(3)	Simulated pressure drop with compression	25x
e15.4 excel(4)	Percentage compression	25x
e15.4 excel(5)	Percentage loss in area	25x

End of file

## OUTPUT FILE FORMAT

- An output text file to print all the informations used in calculations ( "aerout.txt" ).

The format of the output file are as follows:

Line 1, Line, 2, ....., Line 5          Blank Line

Line 6, Line 7, ....., Line 12

Variable

Identity



Format

Text	Main title of the program
-----	
Line 13 & Line 14	Blank Line
-----	
Line 15, Line 16 & Line 17	
Variable	Identity
Format	
	Sub-title of the program 80a
-----	
Line 18, Line 19 & Line 20	Blank line
-----	
Line 21	
Variable	Identity
Format	
text	Blank space 20x "[[[ element description data.....]"
-----	
Line 22	
Variable	Identity
Format	
text ncn	"no.of nodes per element =" Number of nodes per element i10
-----	
Line 23	
Variable	Identity
Format	
text ngaus	Blank space 25x "no.of integration points =" Number of integration points i10
-----	
Line 24, Line 25 & Line 26	Blank Line
-----	
Line 27	
Variable	Identity
Format	
Text	Text indicating choice of the coordinates
-----	
Line 28	Blank Line

Line 29

Variable	Identity	
Format		
text	Blank space	20x
	"[[[ mesh description data .....]"	

Line 30

Variable	Identity	
Format		
text	Blank space	25x
nnp	"no.of nodal points	"
	Total number of nodes in cartridge mesh	i10

Line 31

Variable	Identity	
Format		
text	Blank space	25x
nel	"no.of elements	"
	Total number of elements in cartridge mesh	i10

Line 32

Variable	Identity	
Format		
text	Blank space	25x
nbc	"no.of nodal constraints on boundary	"
	Total number of boundary conditions	i10

Line 33

Variable	Identity	
Format		
text	Blank space	25x
nmat	"no.of different materials	"
	Total number of fluid materials	i10

Line 34 to Line 37

Blank Line

Line 38

text	" ***** material properties
	***** "

Line 39

Blank Line

Line 40

Variable Format	Identity	
	Blank space	3x
text	" id "	
	Blank space	5x
text	" eid.(from-to) "	
	Blank space	3x
text	" consistency co-efficient "	
	Blank space	5x
text	" power law index "	

Line 41

Blank Line

Line 42

Variable Format	Identity	
id	Number of the fluid material	i3
ifrom	Count variable for number of elements	i12
	Blank space	5x
g15.5	Consistency coefficient or fluid viscosity	
	Blank space	15x
g15.5	Power law index for calculating viscosity	

Line 43

Blank Line

Line 44

text	" reference temperature	coefficient b	reference pressure
coefficient a	"		

Line 45

Blank Line

Line 46

Variable Format	Identity	
f16.3	Reference temperature	
f22.4	Coefficient b in power law model	
	Blank space	6x
g10.3	Reference pressure	
	Blank space	9x
g10.3	Coefficient a in power law model	

Line 47

Blank Line

Line 48

text	" Dispersion Coefficient	Density	Shear rate "
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Line 49

Blank Line

Line 50

Variable	Identity	
Format		
g13.3	dispc	Dispersion coefficient
		Blank space 15x
g7.1	density	Density of fluid
		Blank space 6x
g16.5	gamad	Rate of deformation of shear stress tensor

Line 51, Line 52 & Line 53

Blank Lines

Line 54

" \*\*\*\*\* nodal coordinates  
\*\*\*\*\*"

Line 55

Blank Line

Line 56

Variable	Identity	
Format		
	Blank space	7x
text	" id. "	
	Blank space	13x
text	" x-coord "	
	Blank space	13x
text	" y-coord "	
	OR	
	Blank space	7x
text	" id. "	
	Blank space	13x
text	" r-coord "	
	Blank space	13x
text	" z-coord "	

Line 57

Blank Line

Line 58, Line 59, ....., Line 10158

Variable	Identity	Format
id	Node number	i10
	Blank space	10x
f10.6	x or r-coordinate of node 'id'	
	Blank space	10x
f10.6	y or z-coordinate of node 'id'	

-----  
Line 10158 - Line 10160

Blank Line

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Line 10161

text " \*\*\*\*\* element connectivity \*\*\*\*\* "

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Line 10162

Blank Line

-----  
Line 10163

text "id. n o d a l - p o i n t e n t r i e s"

-----  
Line 10164

Blank Line

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Line 10164 - Line 12563

Variable	Identity	Format
id	element number	i5
	Blank space	5x
node(id,1)	Node number of first node of element id	i5
	Blank space	5x
node(id,2)	Node number of second node of element id	i5
	Blank space	5x
node(id,3)	Node number of third node of element id	i5
	Blank space	5x
node(id,4)	Node number of fourth node of element id	i5
	Blank space	5x
node(id,5)	Node number of fifth node of element id	i5
	Blank space	5x
node(id,6)	Node number of sixth node of element id	i5
	Blank space	5x
node(id,7)	Node number of seventh node of element id	i5
	Blank space	5x
node(id,8)	Node number of eighth node of element id	i5
	Blank space	5x
node(id,9)	Node number of ninth node of element id	i5

-----  
Line 12564 - Line 12566

Blank Lines

-----  
Line 12567

text " \*\*\*\*\* nodal constraint

\*\*\*\*\* "

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 Line 12568 Blank Lines  
 -----

-----  
 Line 12569

Text	" id.	dof	value "
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 Line 12570 - Line 12569 + nbc) {line 14528}

Variable	Identity	
Format		
	Blank space	5x
id	node number	i5
	Blank space	5x
ncod	Number of degree of freedom	i5
	Blank space	5x
ibc	value of the boundary condition	

f17.4

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 Line 14528-Line 14530 Blank Lines  
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 Line 14531

Variable	Identity	
Format		
text	"TIME STEP no."	
iter	number of iteration	i5

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 Line 14531 - Line 14533 Blank Lines  
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 Line 14534

text	"nodal velocities and pressures"
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-----  
 Line 14535 Blank Lines  
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 Line 14536

text	" id.	ux	uy	press"
			OR	
	" id.	ur	uz	press"

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-----  
 Line 14537 Blank Line  
 -----

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 Line 14538 - Line 24638 {Line (14537 + nnp) }

Variable	Identity
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Format

	id	node number	i5
e13.4	vel(id)	x or r-velocity at node id	
e13.4	vel(id+nnp)	y or z-velocity at node id	
e22.8	press(id)	pressure value at node id	
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