























F1 Mesh Generation Process

Version 1

April 2025

Open The FluSol

Extreme SSD (I:) > ESDC >					Search ESDC
  Sort  View ...					
Name	Date modified	Type	Size		
 <u>GAS.VRF</u>	<u>10/12/2023 11:07 AM</u>	<u>File folder</u>			
 <u>gms</u> <u>h</u>	<u>10/12/2023 11:07 AM</u>	<u>File folder</u>			
 <u>gui</u>	<u>10/12/2023 11:07 AM</u>	<u>File folder</u>			
 <u>Manual</u>	<u>10/12/2023 11:07 AM</u>	<u>File folder</u>			
 <u>Python24</u>	<u>10/12/2023 11:07 AM</u>	<u>File folder</u>			
 <u>command_line</u>	<u>1/9/2025 11:39 AM</u>	<u>Windows Batch ...</u>	<u>1 KB</u>		
 <u>CREDITS</u>	<u>8/19/2008 12:16 AM</u>	<u>Text Document</u>	<u>6 KB</u>		
 <u>cvrt</u>	<u>10/1/2009 9:19 PM</u>	<u>Application</u>	<u>661 KB</u>		
 <u>esdc96</u>	<u>4/7/2025 12:17 PM</u>	<u>BLK File</u>	<u>1 KB</u>		
 <u>flusol</u>	<u>10/10/2023 5:10 PM</u>	<u>Application</u>	<u>3,361 KB</u>		
 <u>flusol_asy</u>	<u>3/15/2025 4:06 AM</u>	<u>Application</u>	<u>5,250 KB</u>		
 <u>hostid</u>	<u>4/9/2009 12:35 AM</u>	<u>Application</u>	<u>261 KB</u>		
 <u>LICENSE</u>	<u>8/19/2008 12:16 AM</u>	<u>Text Document</u>	<u>19 KB</u>		
 <u>Q</u>	<u>3/14/2004 7:07 PM</u>	<u>Application</u>	<u>95 KB</u>		
 <u>README</u>	<u>8/19/2008 12:17 AM</u>	<u>Text Document</u>	<u>2 KB</u>		
 <u>run-idle</u>	<u>8/25/2009 11:11 PM</u>	<u>Windows Batch ...</u>	<u>1 KB</u>		
 <u>setup</u>	<u>6/4/2016 10:28 PM</u>	<u>Windows Batch ...</u>	<u>1 KB</u>		
 <u>TUBE</u>	<u>8/19/2008 12:17 AM</u>	<u>Application</u>	<u>397 KB</u>		
 <u>tube_1</u>	<u>5/9/2009 6:15 AM</u>	<u>Windows Batch ...</u>	<u>1 KB</u>		

Double click setup to launch the flusol gui



Mesh Generation

FluSol

Solver



Post-Processing

Exit

File Post Post help Manual Changelog

READ Solver Control Materials I.C. & B.C. Particles Reactions

Read mesh and CFD model files

☒ 6. Open *.da☐ 7. New model file name☒ 3. Open *.msh☐ 4. New model file name

5_1. Create 2D and 3D Model without wings

5_2. Create (a) ax.da and (b) Wing-Body combination 3d file

F1888.msh

☒ 1. Open *.cbk☐ 2. Create *.msh file

Convert Model

☒ Nastran model *.nas ----> FluSol model *.da☒ HyperMesh *.hmascii ----> FluSol model *.da

Export Model

☒ FluSol model *.da ----> gmsh geometry *.geo☒ FluSol model & result (pl.res) ----> gmsh result *.pos☒ FluSol model *.da ----> HyperMesh mesh *.hmascii

\\ESDC\\GAS.VRF\\3D\\f1-square-nozzle

Name	Date modified	Type	Size
2025-04-05	4/5/2025 12:42 PM	File folder	
f1444	10/12/2023 11:02 AM	File folder	
f1858	10/12/2023 11:02 AM	File folder	
f1862	10/12/2023 11:02 AM	File folder	
f1838	10/12/2023 11:02 AM	File folder	
F1444	4/22/1996 5:39 PM	MSH File	2 KB
F1858	4/24/1996 10:07 PM	MSH File	2 KB
F1868	4/22/1996 5:39 PM	MSH File	2 KB
F1888	4/22/1996 5:39 PM	MSH File	2 KB
FluSol F1 Mesh Generation Process	3/9/2025 11:18 PM	Microsoft Power...	3,482 KB

READ Solver Control Materials I.C. & B.C. Particles Reactions

Read mesh and CFD model files

☐ 6. Open *.da☐ 7. New model file name

8. Run FluSol

☒ 3. Open *.msh☒ 4. New model file name

5_1. Create 2D and 3D Model without wings

/ESDC/GAS.VRF/3

3d.da

5_2. Create (a) ax.da and (b) Wing-Body combination 3d file

☐ 1. Open *.cbk

2. Create *.msh file

View Mesh

Convert Model

☐ Nastran model *.nas ----> FluSol model *.da☐ HyperMesh *.hmascii ----> FluSol model *.da

Export Model

☒ FluSol model *.da ----> gmsh geometry *.geo☐ FluSol model & result (pl.res) ----> gmsh result *.pos☐ FluSol model *.da ----> HyperMesh mesh *.hmascii

Write model

Preview model

EXIT

1. Click 4 to enter new model file
2. Click 5_1 to generate 3d data file

```
4555, 4555,1,mach
5120, 5120,1,mach
5241, 5241,1,mach
LARGEST NODE NUMBER , NOMAX= 6751
TOTAL NUMBER OF NODES, INODE= 6751
newfile= geo.m4 copy_str= copy geo.m4 3d.da
1 file(s) copied.
```

Read mesh and CFD model files

6. Open *.da 7. New model file name 8. Run FluSol

I:/ESDC/GAS.VRF/3

3. Open *.msh 4. New model file name 5_1. Create 2D and 3D Model without wings

5_2. Create (a) ax.da and (b) Wing-Body combination 3d file

1. Open *.cbk 2. Create *.msh file

View Mesh

Convert Model

Nastran model *.nas ----> FluSol model *.da

HyperMesh *.hmascii ----> FluSol model *.da

Export Model

FluSol model *.da ----> gmsh geometry *.geo

FluSol model & result (pl.res) ----> gmsh result *.pos

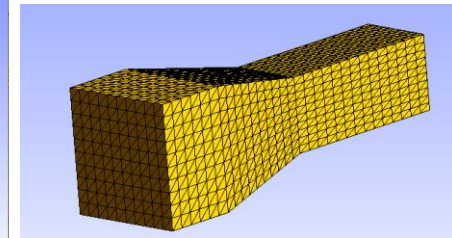
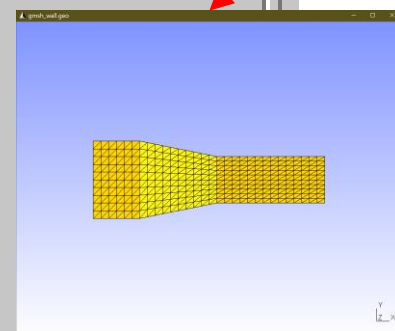
FluSol model *.da ----> HyperMesh mesh *.hmascii

Write model

Preview model

EXIT

1. Click 6 to to open 3d.da modelfile
2. Click View Mesh to see model
3. Then closed all pictures



Solver Block☒ Title description

mach 4.0 flow through a reduced square nozzle

Solver	Compressible Flow	▼
Dimension	3D	▼
Arti	pressure	▼
Memory	store in ram	▼
Convert	none	▼
File	m4	

☐ Conical Flow☐ transient☒ Adapt = on☐ Restart= 0 or 1☐ Ishape =0 or 1☐ Save boundary normal☐ Save shape functions☒ Inviscid flow calculation☐ Viscous flow calculation☐ Lift☒ Wall☐ Wing☐ Ele☐ Node☐ Upwind☐ Grid☐ Steady

1. Click the Solver button to setoff the initial wall condition
2. After setoff wall condition

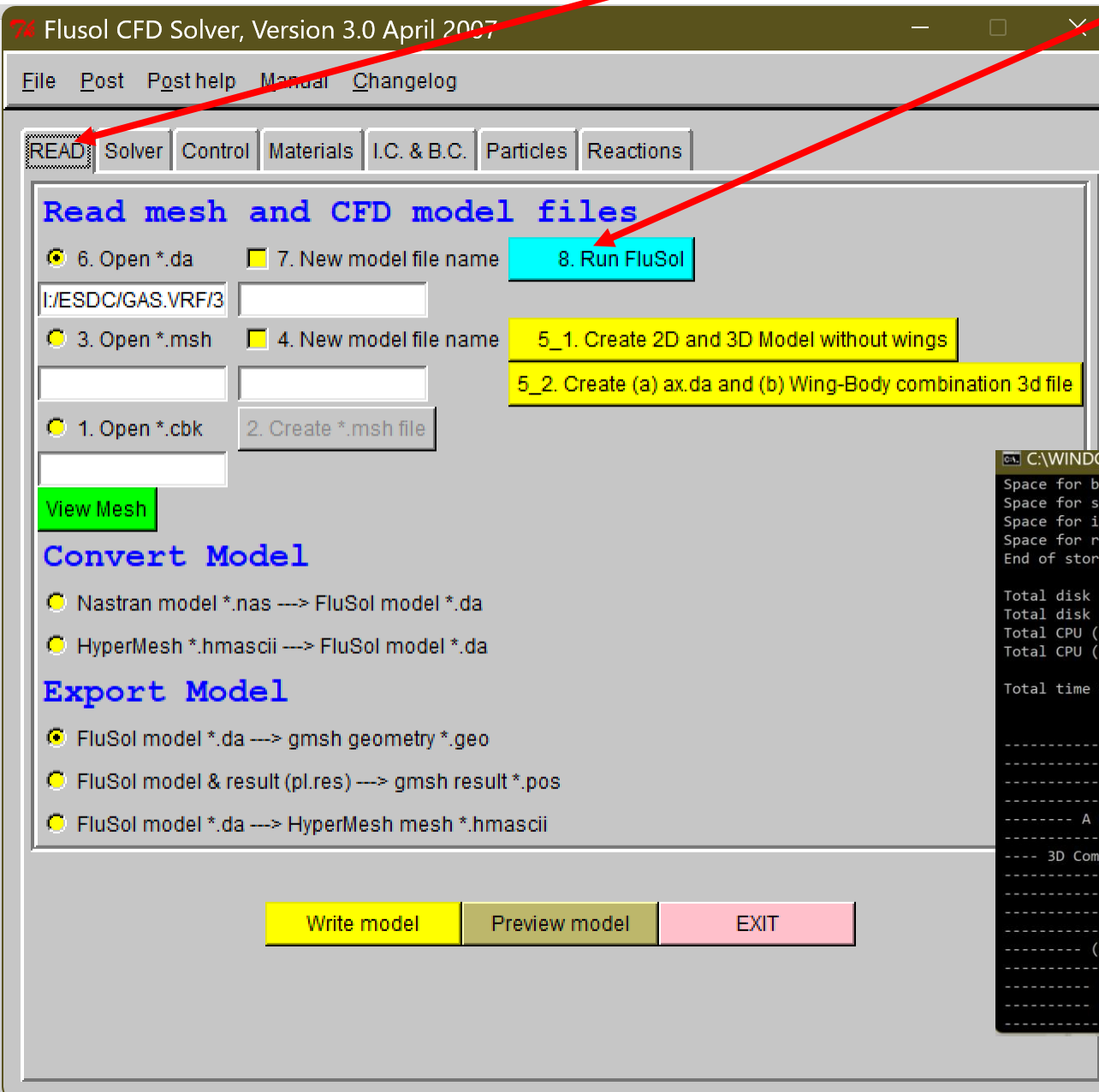
Solver Block☒ Title description

mach 4.0 flow through a reduced square nozzle

Solver	Compressible Flow	▼
Dimension	3D	▼
Arti	pressure	▼
Memory	store in ram	▼
Convert	none	▼
File	m4	

☐ Conical Flow☐ transient☒ Adapt = on☐ Restart= 0 or 1☐ Ishape =0 or 1☐ Save boundary normal☐ Save shape functions☒ Inviscid flow calculation☐ Viscous flow calculation☐ Lift☐ Wall☐ Wing☐ Ele☐ Node☐ Upwind☐ Grid☐ Steady

1. Click the Read button to click 8 Run Flusol
2. Flusol will solve this problem :

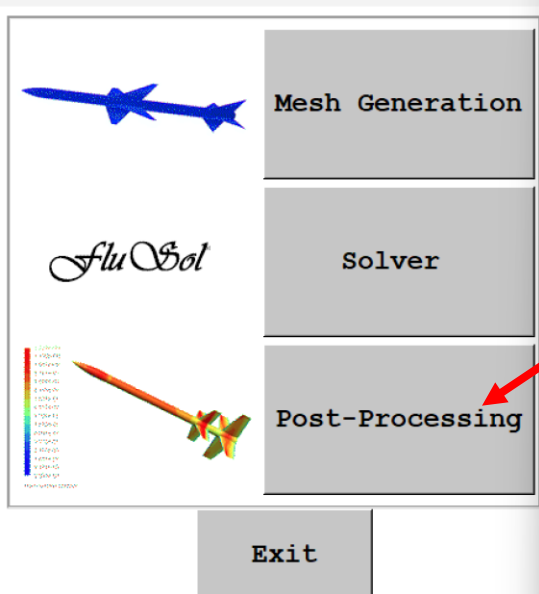


```
C:\WINDOWS\system32\cmd.exe
Space for boundary conditions = 0 words
Space for shape functions = 612000 words
Space for input data = 58063 words
Space for result data = 0 words
End of store

Total disk space needed for this run = 670063 Words
Total disk space needed for this run = 2.556 Mega-Bytes
Total CPU (RAM) used for this run = 3355165 Words
Total CPU (RAM) used for this run = 12.799 Mega-Bytes

Total time for this run = 67 seconds

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----- Flusol -----
----- A General Purpose Fluid Flow Solver -----
----- 3D Computational Fluid Dynamics Program -----
----- Version 3, Jan. 2008 -----
----- (c) Copyright 1996 -----
----- Engineering Software Development Company -----
----- Email :contact@cf-d-rocket.com -----
-----
```

1. Click the Post-processing
2. Plot the surface mach number

