ASM Lab
User Guide

Version 2026.1.6

Mine ventilation design and simulation

What ASM Lab does

- Draw a mine's airways in 3D, or import them
- Place fans, regulators, shafts and refuge bays
- Solve the airflow in every airway
- See flow, velocity and pressure in colour
- Open orebodies and Datamine block models
- Works fully offline, saves as you go

IMAGE

Cover shot: a solved mine coloured by flow

01

Getting started

Install · Updates · The screen · Your first project

Install ASM Lab

1

Download

- Open the download page
- github.com/Respect-masithulela/ASM-Lab-Releases/releases/latest
- Pick ASM-Lab-Setup-….exe

2

Run the installer

- Windows may warn: “unknown publisher”
- Click More info → Run anyway

3

Finish

- Choose the folder
- Say Yes to a desktop shortcut
- ASM Lab opens

Updates

When a new version is out

- ASM Lab checks at start-up
- A window shows what is new
- Update: downloads in the background
- Restart now: installs in seconds
- Later: installs when you close

IMAGE

The “update available” window

The screen at a glance

IMAGE

Full window with numbered labels: 1 Menus · 2 Ribbon · 3 Outliner · 4 3D view · 5 Tools on the view · 6 Inspect panel · 7 Status bar and solver log

Find your way

Top

Menus

- File · Edit · Mine · View

Ribbon tabs

- Home · Design · Network · Simulation

Right corner

- Help · Report bug · Settings · Open

Around the 3D view

Left

- Outliner · Drawing pen · Colour · Clip

On the view

- Fit · Reset · Grid · Labels · Flow

Right and bottom

- Inspect panel · Status · Solver log

Start a project

1

New

- File → New (Ctrl+N)
- Give it a name

2

Open or import

- File → Open (Ctrl+O)
- DXF, JSON, spreadsheets, 3D models, Datamine .dm

3

Or try a sample

- Mine → Load sample…
- Solver checks and complete mines

IMAGE

Start screen with New / Open / Samples

Samples and tutorials

Sample projects

- 10 solver check cases
- 6 mines with block models
- Copper, UG2, Merensky, coal, gold, nickel
- Open one: it replaces the current project

Tutorials

- Help (F1) → Tutorials
- “Every button”: a tip on each control
- First solve · Fans · Natural ventilation
- Cards never lock the software

Move around in 3D

Mouse

- Left-drag: rotate
- Right-drag: pan
- Wheel: zoom
- Middle-drag: zoom

Keys

- 7 top · 1 front · 3 right · 0 iso
- . frame everything
- 5 perspective / orthographic
- M measure · I elevation

02

Design

Tunnels · Shafts · Fans · Regulators · Editing

Draw tunnels

1

Start

- Home → Draw tunnel
- Or press A

2

Click points

- Each click adds a node
- Snaps to the grid and nodes

3

Finish

- Press Esc or right-click
- Set size and shape in Inspect

IMAGE

Drawing a tunnel: clicks and the preview line

More shapes

Shafts and curves

- Add shaft: vertical airways
- Curved tunnel: smooth bends
- Refuge bay: sits on a tunnel
- Working elevation sets the drawing plane

IMAGE

A shaft, a curved tunnel and a refuge bay

Edit

Change the layout

- Duplicate: Shift+D, with spacing and count
- Split: cuts at the clicked point
- Merge nodes · Fillet corners
- Delete: Del

Move things

- G: move gizmo · R: rotate gizmo
- Arrow keys nudge the selection
- Ctrl+Z undo · Ctrl+Shift+Z redo
- Alt+A: select none

Place a fan

1

Pick the tool

- Home → Place fan
- Choose a fan from the list

2

Click an airway

- Both ends light up
- An arrow shows the direction

3

Set direction

- Click the side the air goes to
- Fan curves: check the duty

IMAGE

Fan on an airway with its direction arrow

Regulators and fan curves

Regulators

- Home → Add regulator
- Holds an airway at a set flow
- Or holds a set pressure drop

Fan curves

- Simulate → Fan curves
- Library of fans, or your own curve
- Go to fan: jump to it in 3D

03

Simulate

Check · Solve · Read the results · Flow animation

Check and solve

1

Check

- Simulate → Check
- Finds loose ends and gaps

2

Solve

- Press F5
- Solves the whole project

3

Read the log

- Solver log at the bottom
- Converged, with iterations

IMAGE

Solver log after a successful solve

See the results

Colour by

- Display → Colour by
- Flow · Velocity · Pressure drop
- Resistance · Density · Temperature
- Legend shows min and max

IMAGE

Mine coloured by velocity with the legend

Inspect an airway

Click any airway

- Flow, velocity, pressure drop
- Size, length, friction factor
- Fan duty on fan airways
- Edit values and Apply

IMAGE

Inspect panel for a selected airway

Watch the air move

Flow animation

- Play button on the left of the view
- Arrows or balls move with the air
- Up / down arrows: slower or faster
- Speed from ×0.05 to ×4

Flow arrows

- Fixed arrows show direction
- Toggle with the arrow button
- Thermal: Simulate → Thermal

04

Models and files

Block models · DXF · Saving · Backups · Export

Orebodies and block models

Datamine block models

- File → Open a .dm file
- Colour by GRADE or any field
- Hide ranges you do not need
- Opacity to see tunnels inside

IMAGE

Block model coloured by grade, with tunnels

Drawings and clipping

DXF drawings

- Treat as tunnels: becomes a network
- Or keep as geology / orebody
- Colour panel: a colour per layer

Clip

- Six cutting planes
- Slice into the model
- Include tunnels or solids only

Save and recover

Saving

- Ctrl+S save · Ctrl+Shift+S save as
- Autosave every change
- Save Copy: a spare file

If something goes wrong

- File → Backups…: last 5 versions
- Recover Autosave after a crash
- A crashed panel shows Retry

Share your work

Export

- File → Export
- JSON · DXF · glTF (.glb)
- CSV tables · Screenshot PNG

Reports

- Simulate → Report
- Summary of the solved network
- Ready to print or share

Report a bug

1

Open

- Report bug (top right)
- Or Report this crash on an error card

2

Describe

- Title and what happened
- Steps, if you can

3

Send

- Goes privately to the team
- Offline? Sent later

IMAGE

Report a bug window

Keyboard shortcuts

Files and editing

- Ctrl+N new · Ctrl+O open · Ctrl+S save
- Ctrl+Z undo · Ctrl+Shift+Z redo
- Shift+D duplicate · Del delete
- A draw tunnel · J connect nodes

Solving and views

- F5 solve · F1 help
- 7 1 3 0 views · . frame all
- 5 orthographic · G move · R rotate
- M measure · I elevation

Need help?

Help (F1) → Tutorials

Report bug, inside ASM Lab

github.com/Respect-masithulela/ASM-Lab-Releases/releases/latest