



# Applications of 3D modeling and simulation ventilation in salt mine for safety

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# Agenda

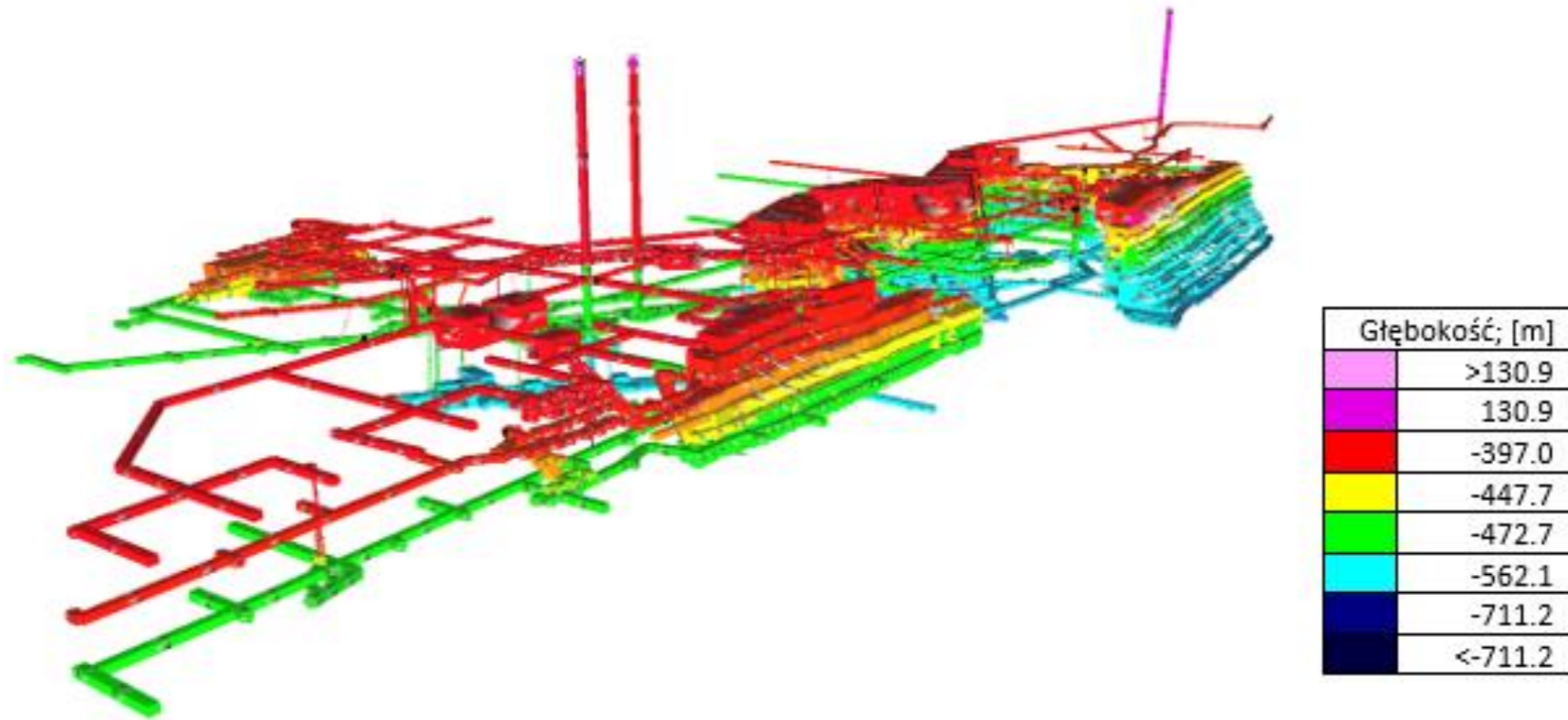


- Introduction
- Problems in modelling the structure of a ventilation network,
- Accuracy of the ventilation network model,
- Possibilities of stabilizing airflow in excavations,
- Summary.

# Problems in modelling the structure of a ventilation network



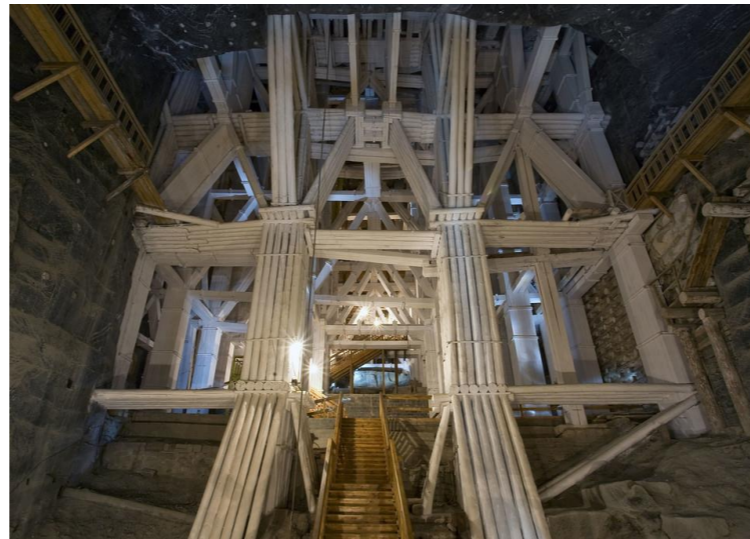
Extensive area vertically and horizontally - excavations are not being decommissioned,



# Problems in modelling the structure of a ventilation network



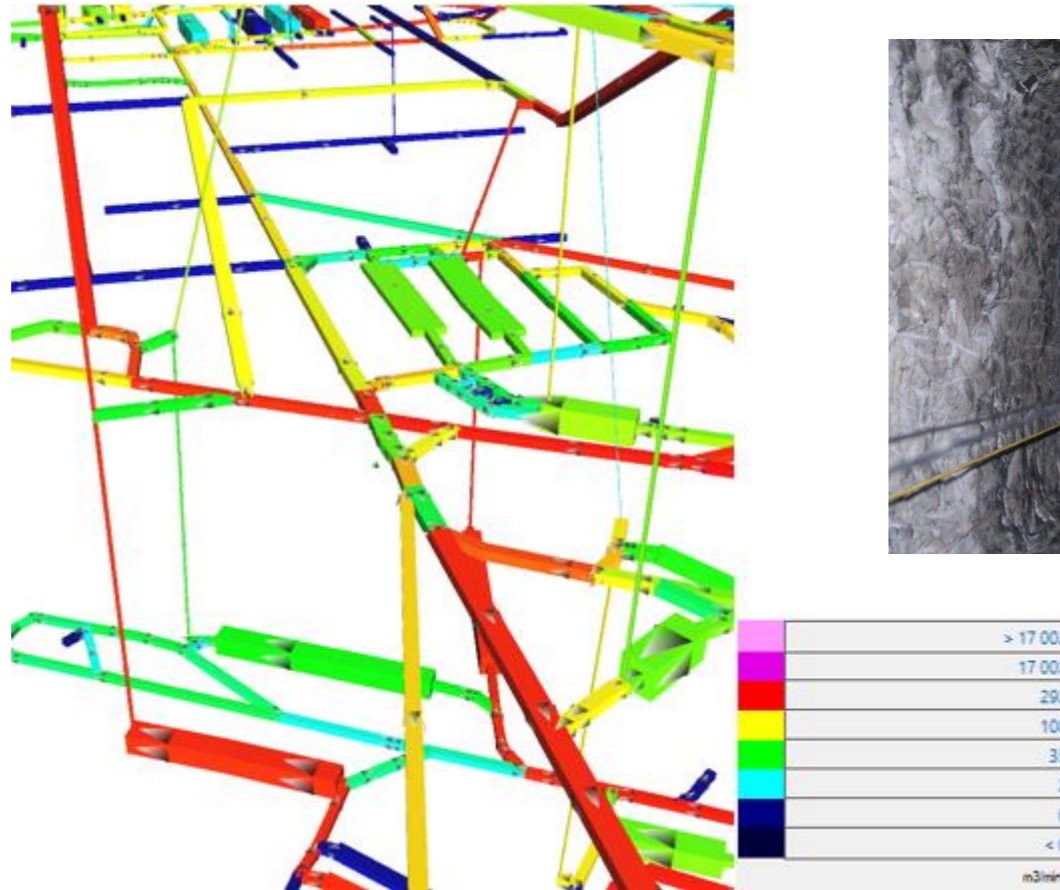
Many types of support depending on the type of rock mass



# Problems in modelling the structure of a ventilation network



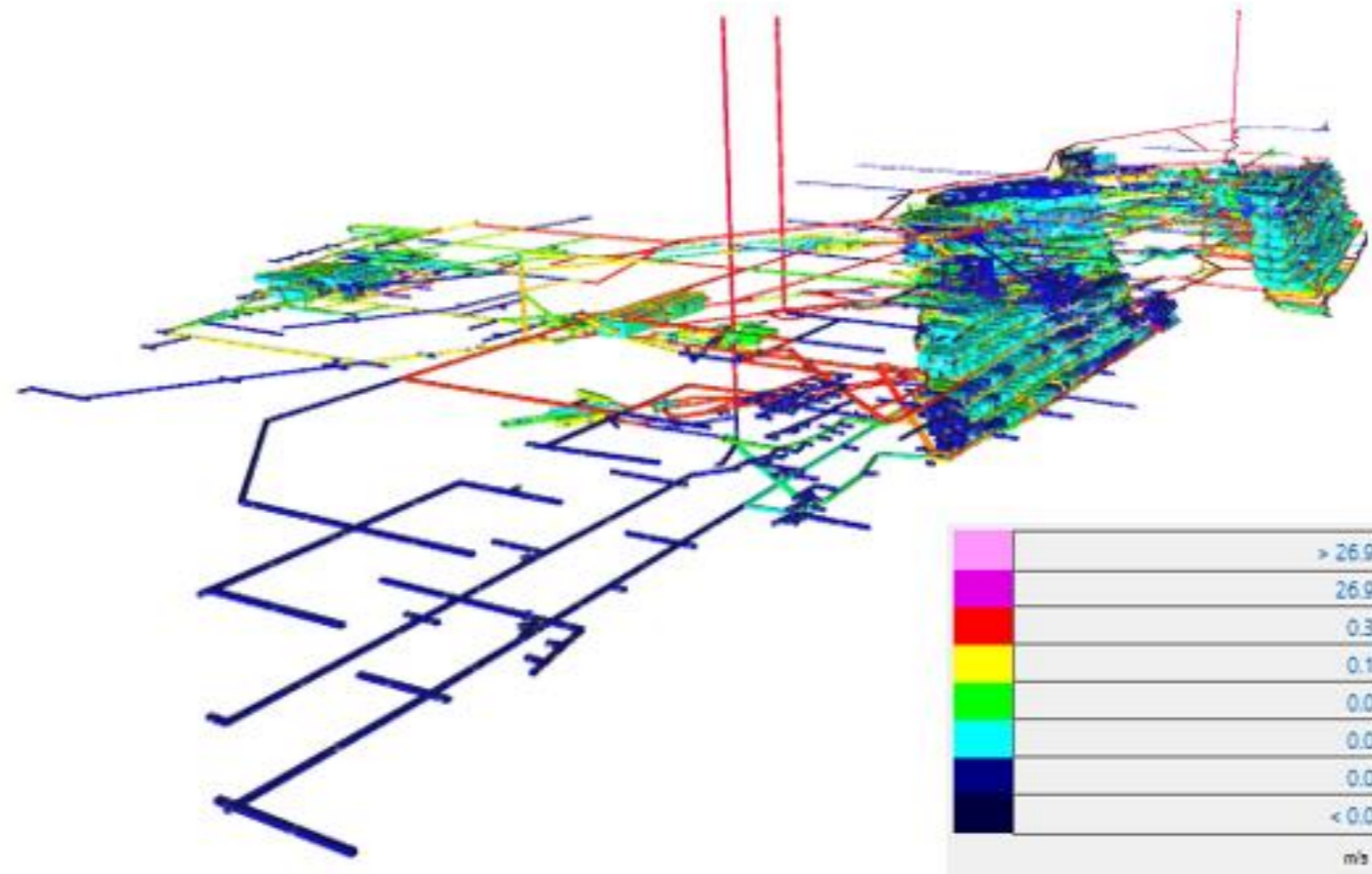
Numerous vertical joints resulting from operating technology



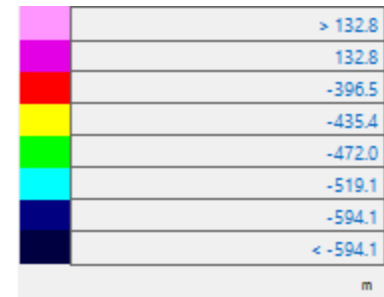
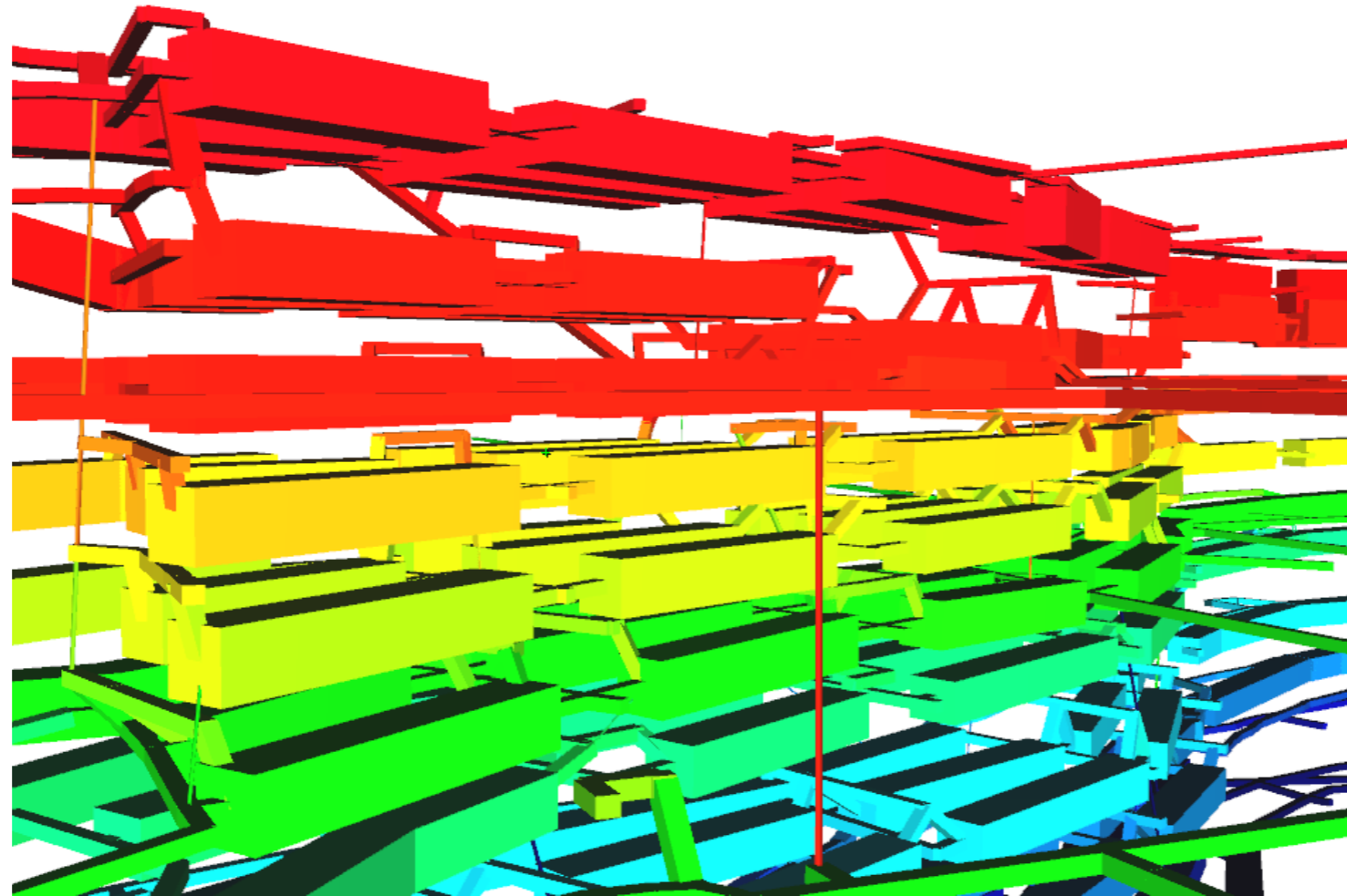
# Accuracy of the ventilation network model



Analysis of airflow in underground excavations

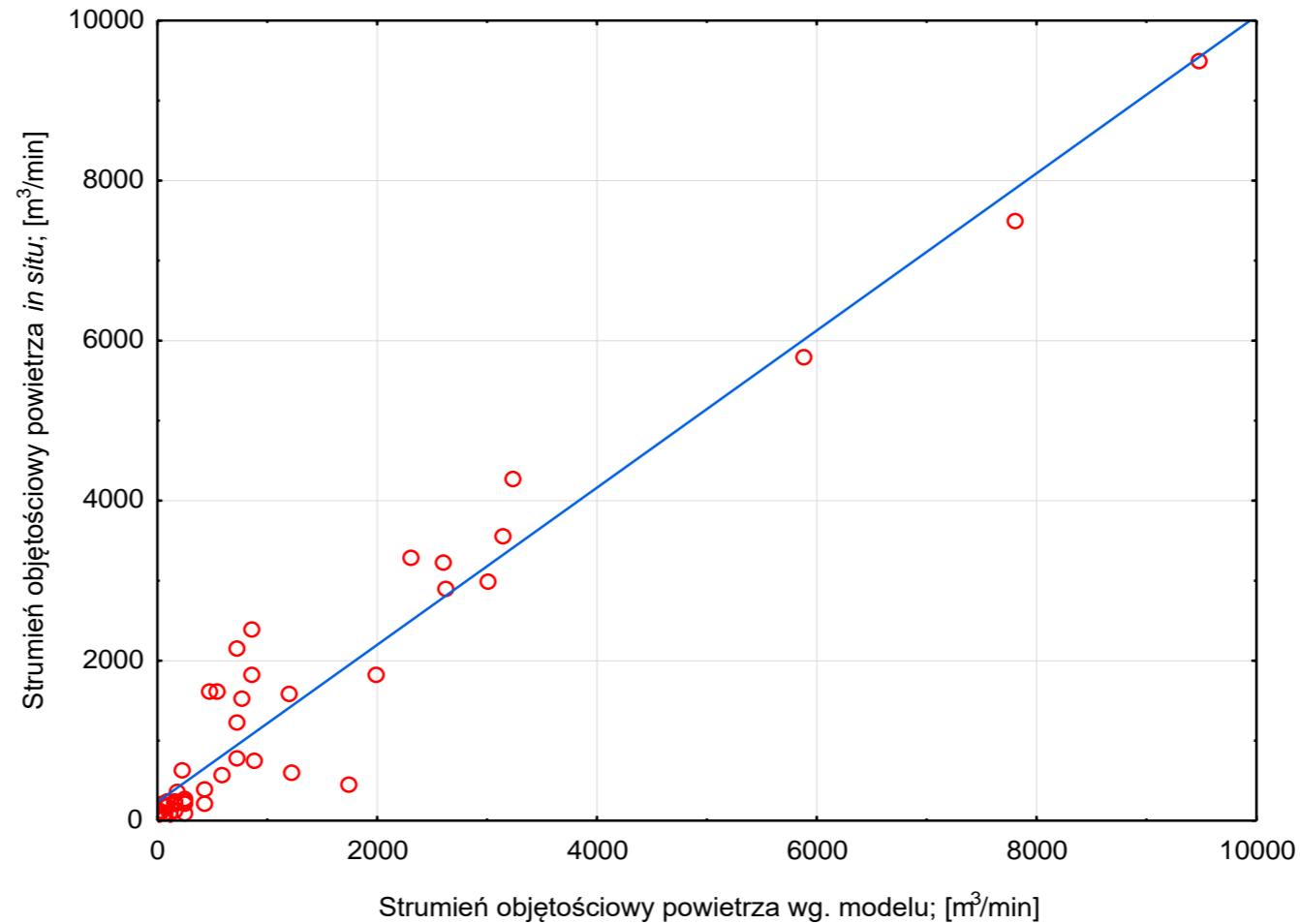


# Accuracy of the ventilation network model



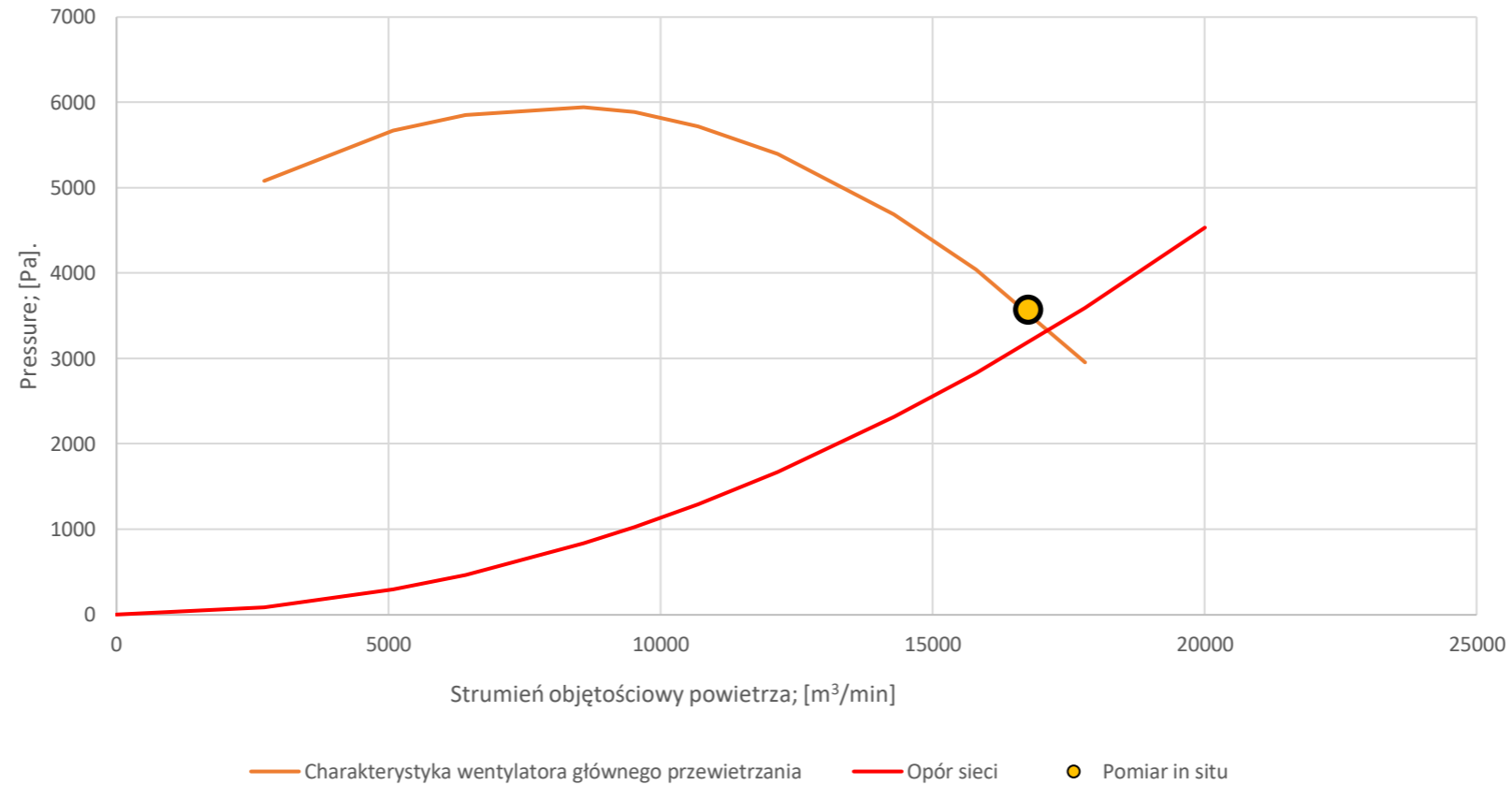
# Accuracy of the ventilation network model

Correlation coefficient 0.967

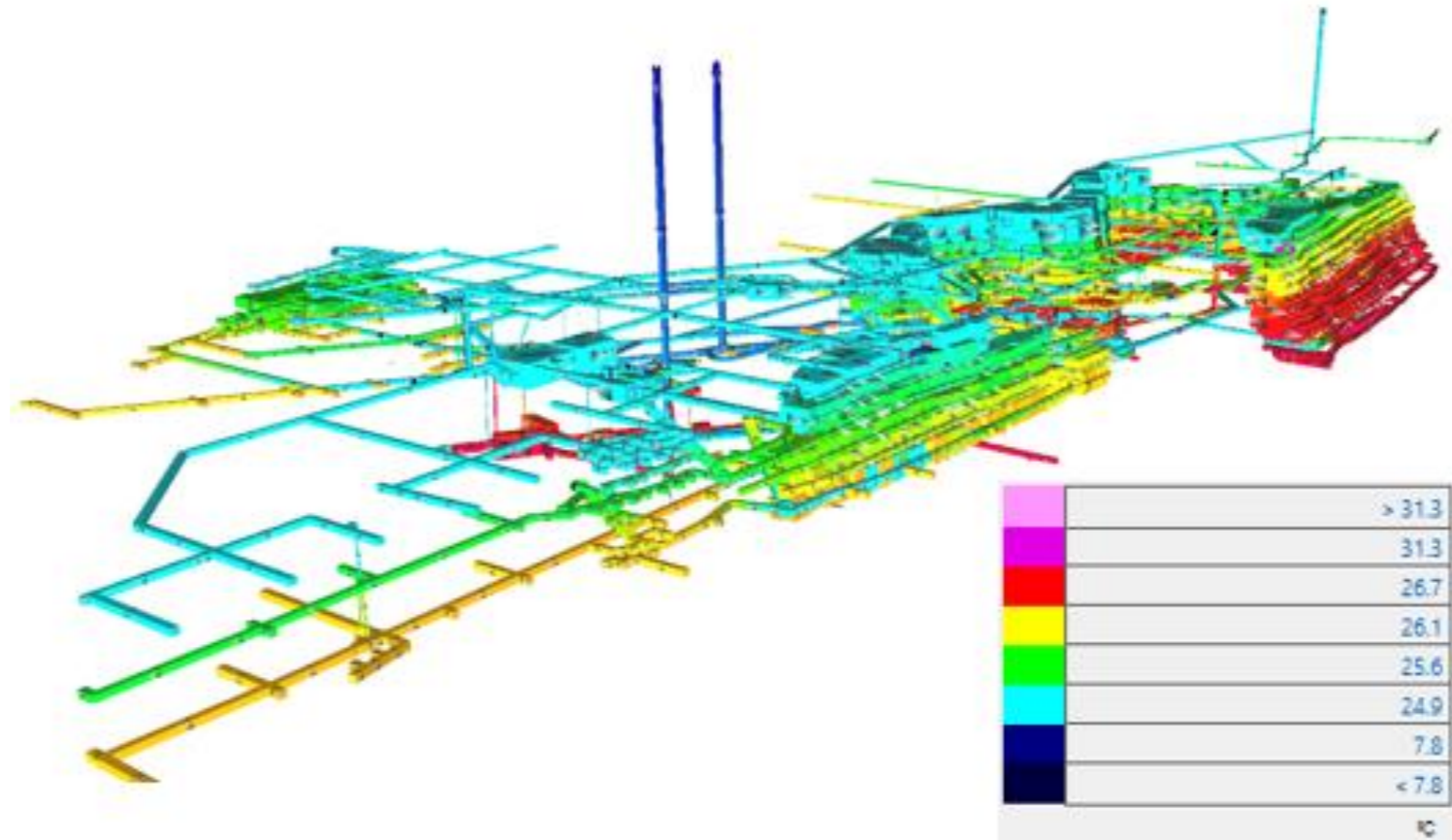




# Accuracy of the ventilation network model



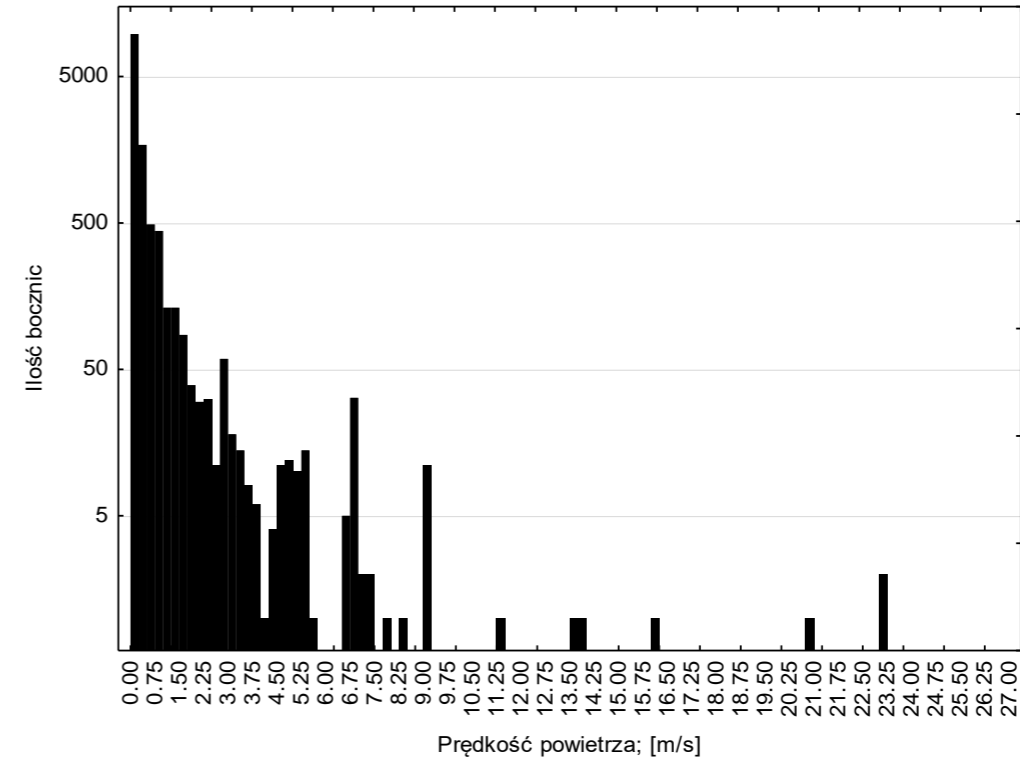
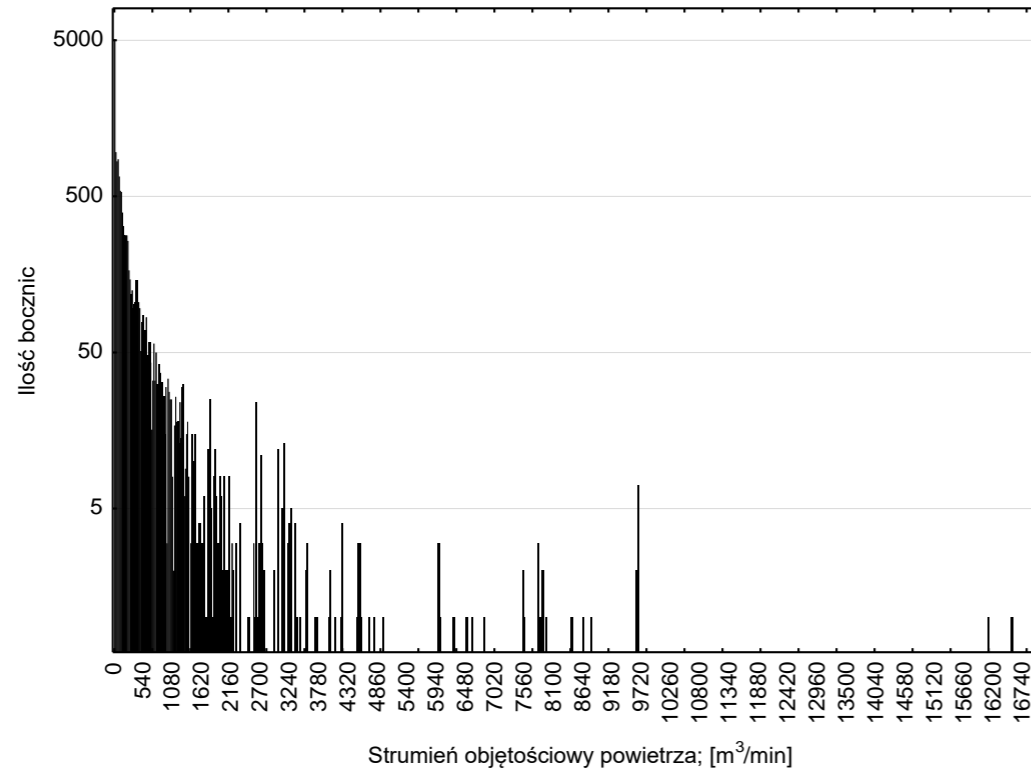
# Accuracy of the ventilation network model



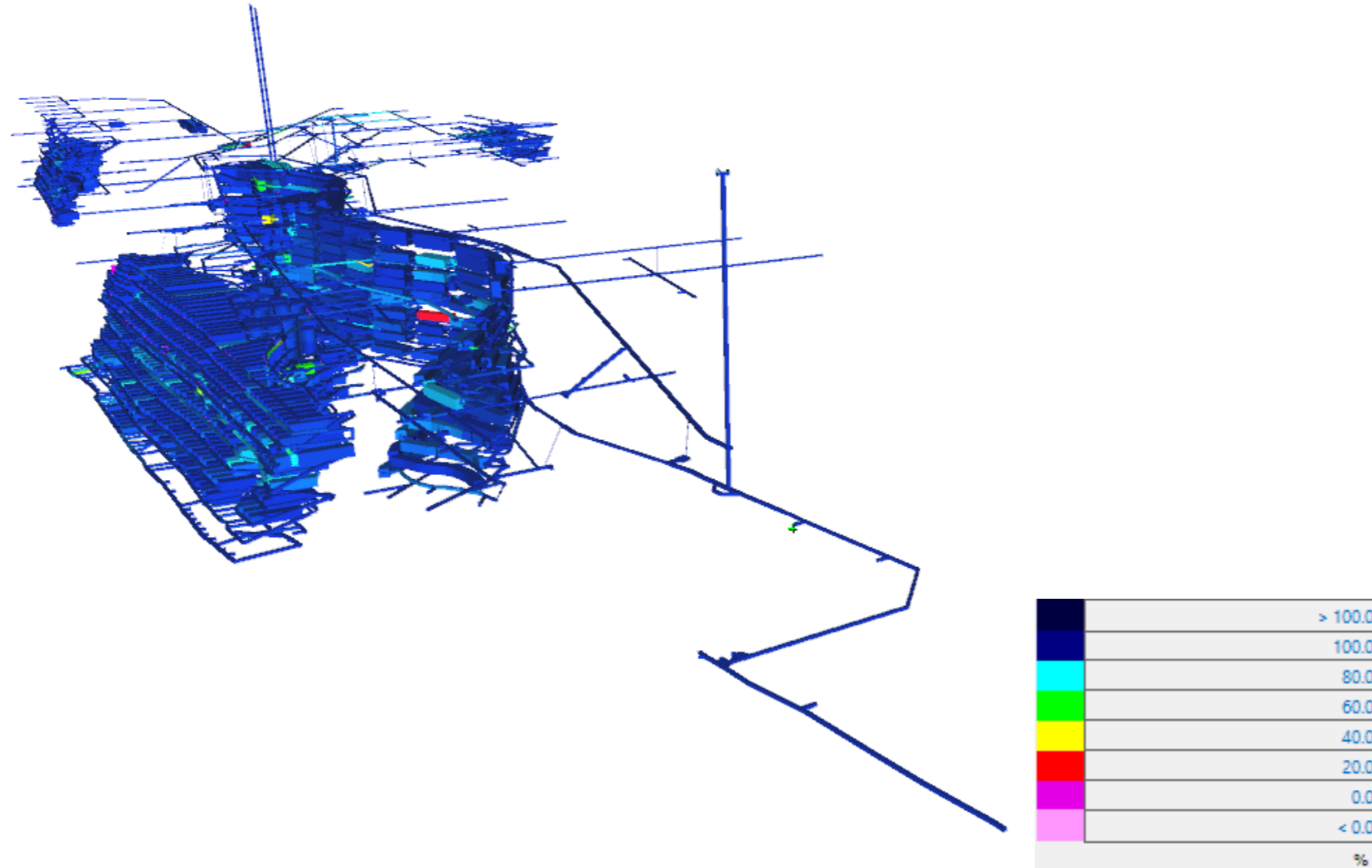


# Options for stabilising the flow rate

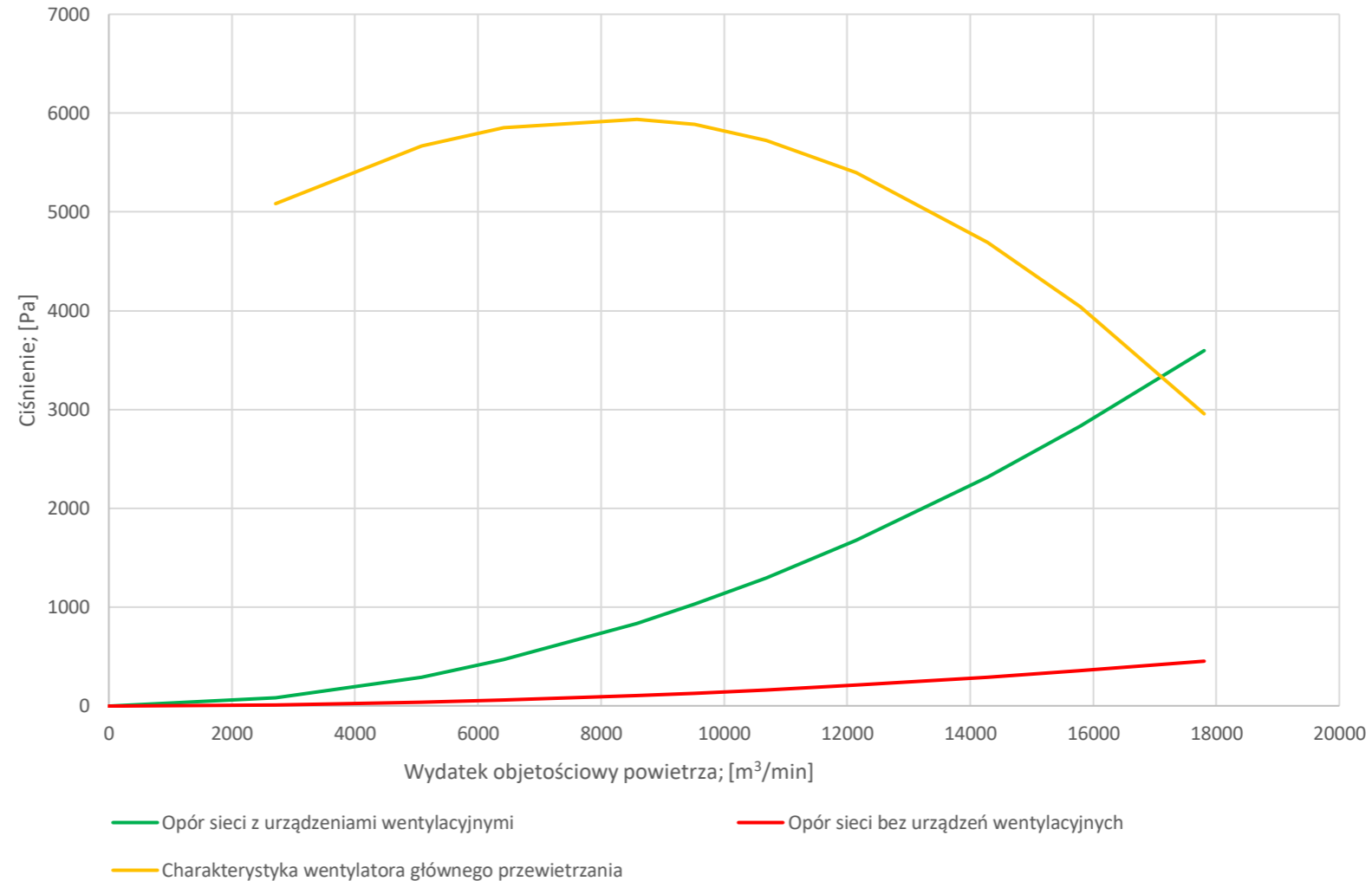
## Limiting airflow fluctuations



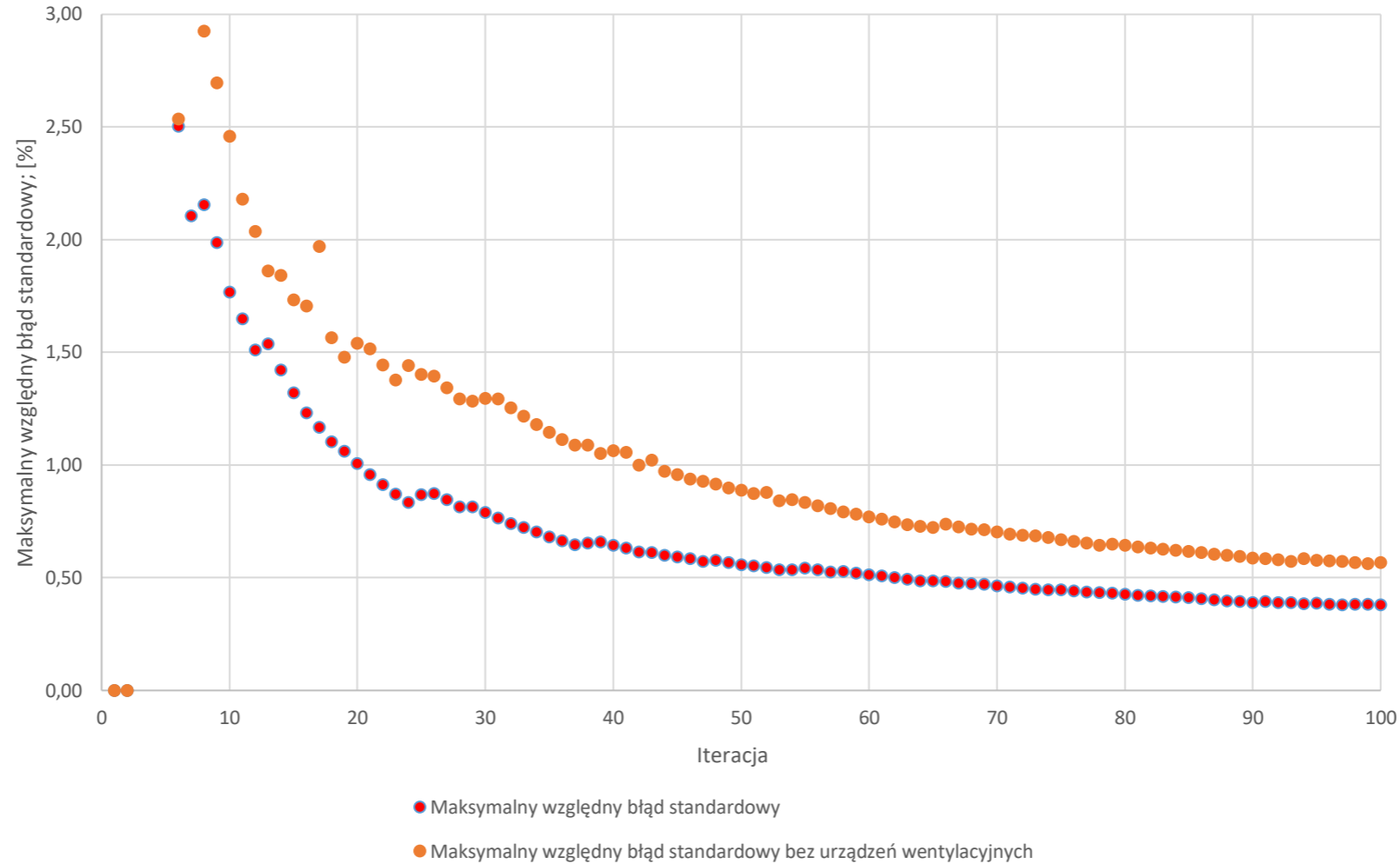
# Options for stabilising the flow rate



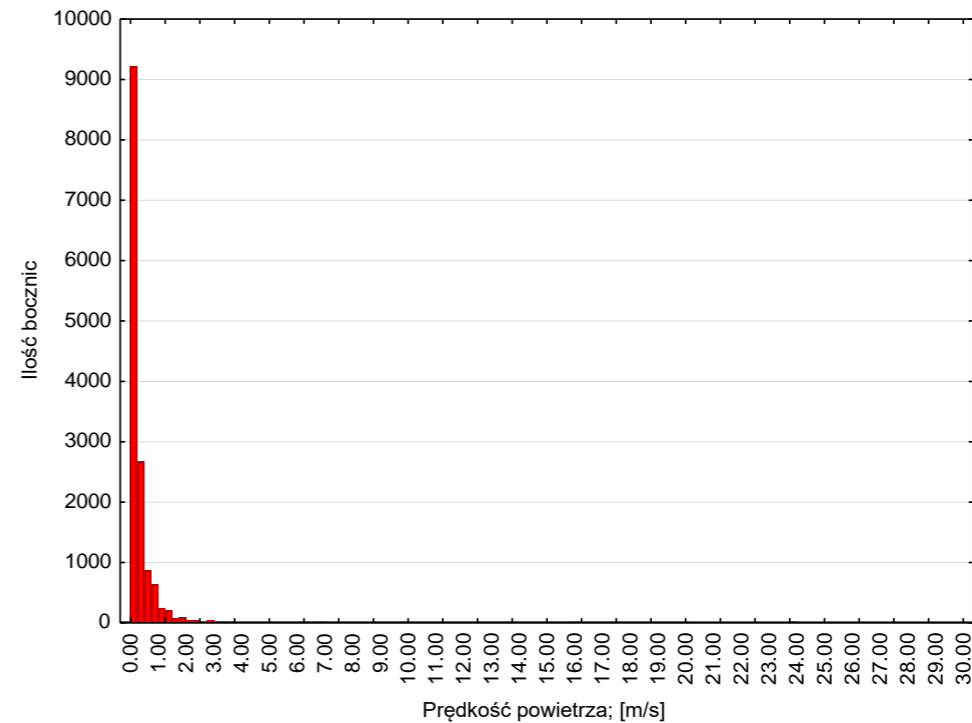
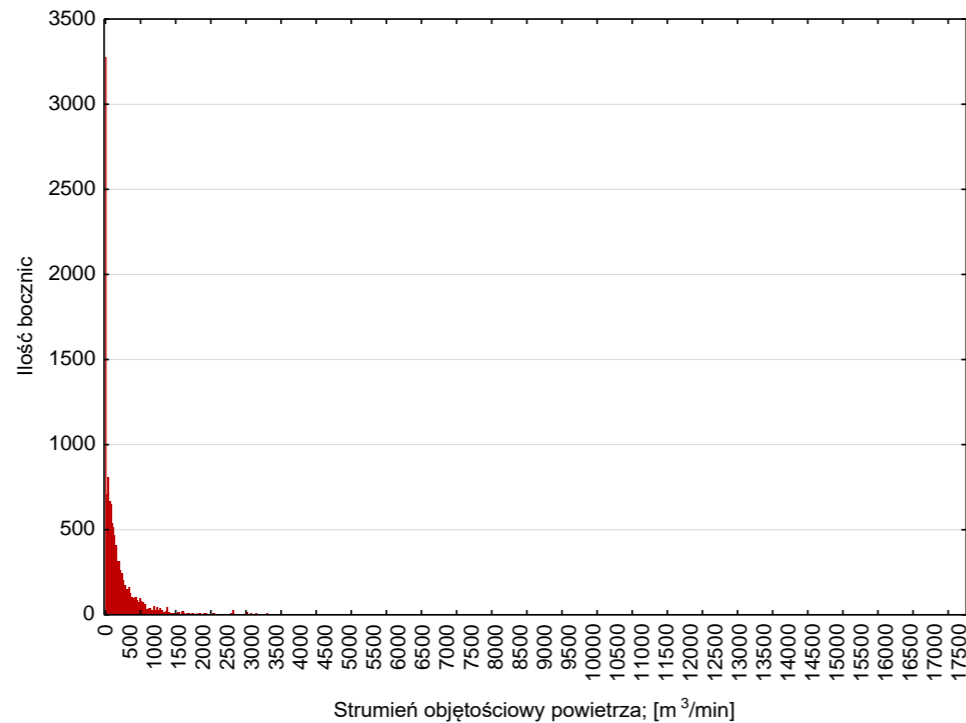
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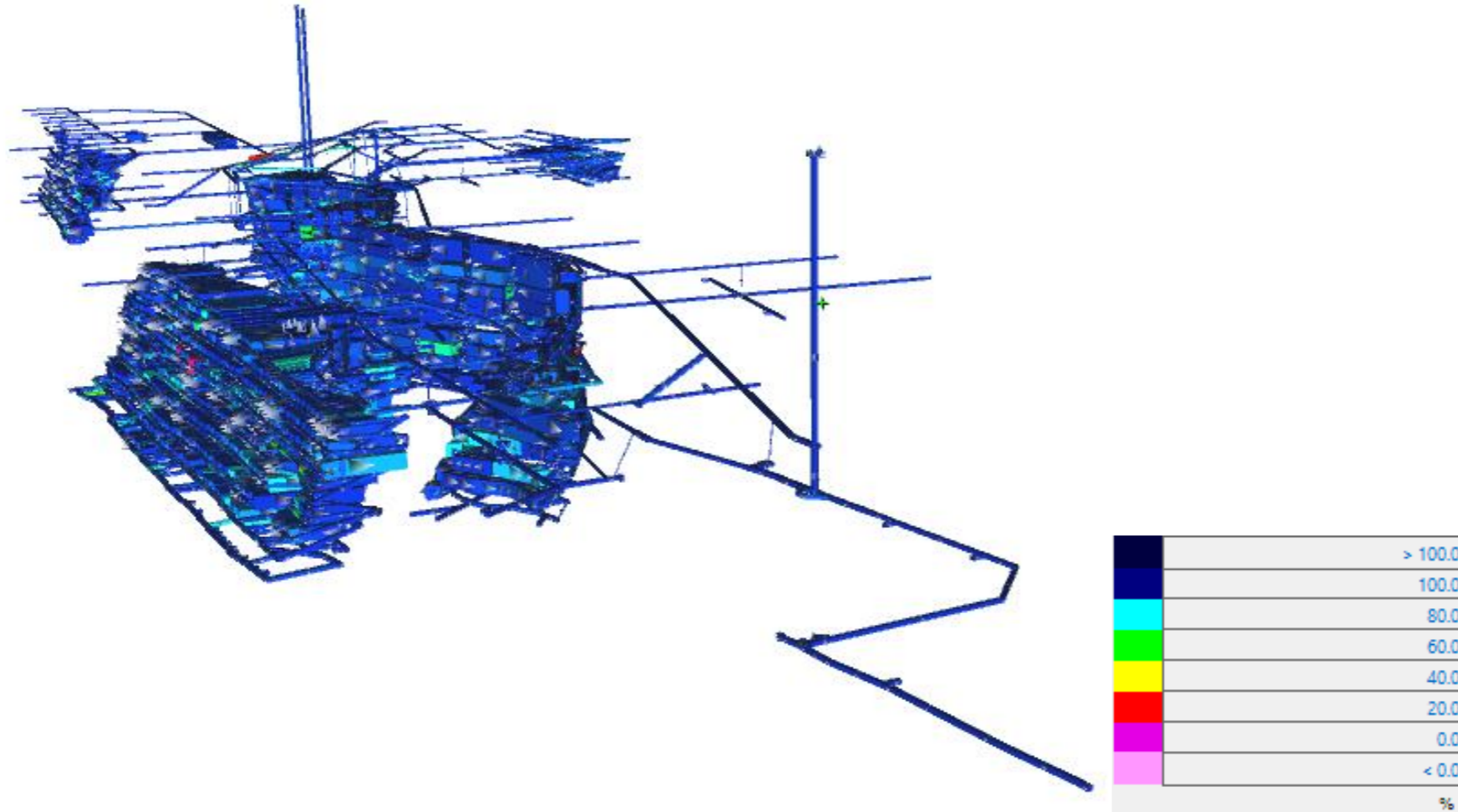


# Options for stabilising the flow rate





# Options for stabilising the flow rate



# Summary



- The ease of maintenance of underground excavations and their number create a numerous and complex network of ventilation connections.
- A key element in ensuring the continuity of workings is the isolation of excavations after mining.
- Stabilising the airflow in the ventilation network reduces its flow fluctuations and improves safety in case of natural hazards such as gas, etc.