HARD ROCK MINE VENTILATION

HOW MUCH VENTILATION AIR TO SUPPLY?

DEPENDS ON

1. **MINING METHOD**
2. **PRODUCTION RATE**
3. **ROCK HANDLING**

INDICATIVE AMOUNTS

$Q = \alpha t + \beta$

α **mining method (t = production rate Mtpa)**

β **rock handling (shaft or decline)**

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Mining method	α *(m³/s/Mtpa)*
Block caving	**50**
Room and pillar (continuous miner)	**75**
Sub level caving	**125**
Sub level open stopes > .5 Mt	**175**
Sub level open stopes < .5 Mt	**250**
Room and pillar (conventional)	**200**
Top slice and bench	**250**
Longitudinal sublevel caving	**250**
Mechanised cut and fill	**325**
Non-mechanised mining	**400**

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ROCK HANDLING

Shaft haulage, β = 100 m^3/s to 150 m^3/s depending on whether conveyors are used. Includes a typical jaw crusher, if a gyratory crusher is used, β may be up to 100 m^3/s greater. Includes normal ore pass ventilation.

Decline haulage, β = 7.5 x Mtpa.km (minimum 50 m^3/s).

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EXAMPLES

- **4.0 Mtpa sub level caving operation with a shaft and gyratory crusher.**

$Q = 4.0 \times 125 + 125 + 100 = 725\ m^3/s$

- **1.5 Mtpa SLOS with small stopes, decline (1:8) haulage, mean depth 1000 m**

$Q = 1.5 \times 250 + 1.5 \times 8 \times 1.0 \times 7.5 = 465\ m^3/s$

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CAUTIONS

Development – α values include a nominal amount of 15% of production rate. Higher development rates assessed at 250 m^3/s per Mtpa of additional development.

Unusual conditions – this may include heat and radiation. If the mine depth is close to the critical depth, increasing air quantities may be justified to avoid refrigeration.