

## ECLA EUROPEAN CLASSIFICATION

### E21F SAFETY DEVICES, TRANSPORT, FILLING-UP, RESCUE, VENTILATION, OR DRAINING IN OR OF MINES OR TUNNELS

**Guide heading:** Ventilation of mines or tunnels

- E21F1/00** Ventilation of mines or tunnels; Distribution of ventilating currents (ventilating rooms or spaces in general [F24F](#))
- E21F1/00B . [N: Ventilation of traffic tunnels (during construction [E21F1/04](#) to [E21F3/00](#))]
- E21F1/00C . [N: Ventilation at the working face of galleries or tunnels]
- E21F1/02 . Test models (analogue computers therefor [G06G7/50](#))
- E21F1/04 . Air ducts (suspension devices [E21F17/02](#))
- E21F1/06 . . Duct connections (tube connections in general [F16L](#))
- E21F1/08 . Ventilation arrangements in connection with air ducts, e.g. arrangements for mounting ventilators ([N: [E21F1/00B](#) takes precedence]; ventilators in general [F04D](#))
- E21F1/08B . . [N: using compressed gas injectors]
- E21F1/10 . Air doors ([N: [E21F1/00B](#) takes precedence; air locks [E21F1/14B](#); dam doors [E21F17/12](#)]; doors in general [E06B](#))
- E21F1/12 . . Devices for automatically opening air doors
- E21F1/14 . Air partitions; Air locks ([N: [E21F1/00B](#) takes precedence]; dams [E21F17/103](#); air locks for foundations [E02D](#))
- E21F1/14B . . [N: Air locks (air doors [E21F1/10](#); dam doors [E21F17/12](#))]
- E21F1/16 . Shaft covers
- E21F1/18 . Gravity flow ventilation ([E21F1/02](#) to [E21F1/16](#) take precedence)
- E21F3/00** Cooling or drying of air (air-conditioning rooms or spaces in general [F24F](#))
- Guide heading:** Safety devices (flue-gas indicators [G01N](#)); Rescue devices
- E21F5/00** Means or methods for preventing, binding, depositing, or removing dust [N: (in combination with mining machines [E21C35/22](#)); Preventing explosions or fires (dams [E21F17/103](#); applying liquids or other fluent materials to surfaces in general [B05](#))
- E21F5/02 . by wetting or spraying
- E21F5/04 . . Spraying barriers (spray nipples, spraying in general [B05B](#), [B05D](#); picks with arrangements of fluid-spraying nozzles [E21C35/187](#))

- E21F5/06 . . Fluids used for spraying
- E21F5/08 . Rock dusting of mines; Depositing other protective substances
- E21F5/10 . . Devices for rock dusting
- E21F5/12 . . Composition of rock dust
- E21F5/14 . Fluid barriers or rock dusters made to work by, or at the same time as, shots or explosions
- E21F5/14B . . [N: Fluid barriers]
- E21F5/14D . . [N: Rock dusters]
- E21F5/16 . Layers of hygroscopic or other salts deposited on floors, walls, or the like, for binding dust; Deposition of such layers ([dust-absorbing materials in general C09K3/22](#))
- E21F5/18 . Impregnating walls, or the like, with liquids for binding dust [N: (injections for improving soil or rock [E21D9/00B](#); borehole closures, i.e. packers, for use during the injection process [E21B33/12](#))]
- E21F5/20 . Drawing-off or depositing dust ([dust-removing while drilling E21C7/00](#); while slitting [E21C35/22](#))
- E21F7/00** **Methods or devices for drawing- off gases with or without subsequent use of the gas for any purpose**
- E21F9/00** **Devices preventing sparking of machines or apparatus ([preventing sparking of electric machines or apparatus H01K, H02K](#))**
- E21F11/00** **Rescue devices or other safety devices, e.g. safety chambers, escape ways ([respiratory apparatus A62B7/00](#); revival apparatus [A62B33/00](#); breathing aids for curative purposes [A61H31/00](#))**
- E21F13/00** **Transport specially adapted to underground conditions ([mine cars B61D](#); transport in general, loading [N: unless specially adapted to underground conditions] [B65G](#))**
- E21F13/00B . [N: Crushing devices specifically for conveying in mines]
- E21F13/00C . [N: Staff transport system]
- E21F13/00D . [N: Equipment transport systems]
- E21F13/00D2 . . [N: for mine roof support units for step-by-step movement]
- E21F13/02 . [N: Transport of mined mineral] in galleries
- E21F13/02D . . [N: Shuttle cars]
- E21F13/04 . [N: Transport of mined material] in gravity inclines; in staple or inclined shafts
- E21F13/04B . . [N: Vertical hydraulic conveying of coal ([conveying by water flow in general B65G53/00](#))]
- E21F13/04D . . [N: Bunkers specially adapted for mining purposes ([chutes in general B65G11/00](#))]

- E21F13/04F . . [N: comprising helically running channels (chutes of helical form in general [B65G11/06](#))]
- E21F13/06 . [N: Transport of mined material] at or adjacent to the working face
- E21F13/06B . . [N: Chutes and braking conveyers for average and steep slopes, adapted for mining purposes (chutes in general [B65G11/00](#))]
- E21F13/06C . . [N: Loading devices for use in mining]
- E21F13/06C2 . . . [N: Scrapers (digging devices guided by cables [E02F3/54](#); combined with planing means [E21C27/42](#))] [C9608]
- E21F13/06D . . [N: Scraper chain conveyers (in general [B65G19/00](#))]
- E21F13/06D2 . . . [N: Special adaptations for use at the junction of the working face with the gallery, e.g. driving stations coupled to the driving station of the winning machine]
- E21F13/08 . Shifting conveyers or other transport devices from one location at the working face to another (guiding mining machines along conveyers for the cut mineral [E21C35/12](#); in combination with mine roof supports for step-by-step movement [E21D23/00](#))
- E21F13/08Y . . [N: Conveyer belts removing methods or devices]
- E21F13/08Z . . [N: Armoured conveyers shifting devices]
- E21F13/10 . Anchorings for conveyers
- E21F15/00** **Methods or devices for placing filling-up materials in underground workings (dams [E21F17/103](#); [N: chocks made of flexible containers filled with backfilling material [E21D15/48F](#)])**
- E21F15/00C . [N: characterised by the kind or composition of the backfilling material]
- E21F15/02 . Supporting means, e.g. shuttering, for filling-up materials
- E21F15/04 . . Stowing mats; Goaf wire netting; Partition walls
- E21F15/06 . Filling-up mechanically
- E21F15/08 . Filling-up hydraulically or pneumatically (hydraulic or pneumatic transport devices [B65G](#); pipes, pipe couplings [F16L](#))
- E21F15/10 . . Hydraulic or pneumatic filling-up machines
- E21F16/00** **Drainage (keeping dry foundation sites or other areas in the ground [E02D19/00](#))**
- E21F16/02 . of tunnels
- E21F17/00** **Methods or devices for use in mines or tunnels, not covered elsewhere (mine lighting [F21](#), [H05B](#))**
- E21F17/02 . Suspension devices for tubes or the like, e.g. for ventilating ducts (supporting pipes, cables or protective tubing in general [F16L3/00](#) to [F16L7/00](#))
- E21F17/04 . Distributing means for power supply in mines
- E21F17/06 . . Distributing electric power; Cable networks; Conduits for cables (circuit

- [rrangements for supplying or distributing electric power in general H02J](#)

E21F17/08 . . Distributing hydraulic power; Pipe networks for hydraulic liquid ([pipe-line systems in general F17D](#))
- E21F17/10 . . Distributing pneumatic power; Pipe networks for compressed air ([pipe-line systems in general F17D](#))
- E21F17/103 . Dams, e.g. for ventilation
- E21F17/107 . . inflatable
- E21F17/12 . . Dam doors [[N: \(air doors E21F1/10; air locks E21F1/14B\)](#)]
- E21F17/16 . Modification of mine passages or chambers for storage purposes, especially for liquids or gases ([storing fluids in natural or artificial cavities or chambers in the earth B65G5/00](#))
- E21F17/18 . Special adaptations of signalling or alarm devices ([for mine lifts B66B; gas-sensitive devices per se G01N](#))
- E21F17/18B . . [[N: Rock-pressure control devices with or without alarm devices; Alarm devices in case of roof subsidence \(props with load-measuring devices E21D15/46\)](#)]