

ECLA EUROPEAN CLASSIFICATION

- B04C** **APPARATUS USING FREE VORTEX FLOW, e.g. CYCLONES** ([N: centrifugal separation of water from steam [B01D45/12](#)]; jet mills [B02C19/06](#); [N: wind sifters [B07B7/00](#)]; cyclonic type combustion apparatus [F23](#); [N: vortex burners for cyclone-type combustion apparatus [F23D1/02](#); cyclonic type combustion apparatus for gas turbines [F23R3/00](#)]) [C9411]
- Note**
This subclass covers apparatus for separating, mixing or like treating in which centrifugal effects are generated by free vortex flow, otherwise than by rotary bowls, rotors or curved passages.
- B04C1/00** **Apparatus in which the main direction of flow follows a flat spiral; [N: so-called flat cyclones or vortex chambers]**
- B04C3/00** **Apparatus in which the axial direction of the vortex [N: (flow following a screw-thread type line)] remains unchanged [N: Also devices in which one of the two discharge ducts returns centrally through the vortex chamber, a reverse-flow vortex being prevented by bulkheads in the central discharge duct (combined with other devices [B04C9/00](#))] [C9411]**
- B04C3/02** . with heating or cooling, e.g. quenching, means
- B04C3/04** . Multiple arrangement thereof [N: (combined with types according to other groups, [B04C7/00](#))]
- B04C3/06** . Construction of inlets or outlets to the vortex chamber
- B04C5/00** **Apparatus in which the axial direction of the vortex is reversed [N: (combined with other devices [B04C9/00](#))]**
- B04C5/02** . Construction of inlets by which the vortex flow is generated [N: e.g. tangential admission, the fluid flow being forced to follow a downward path by spirally wound bulkheads, or with slightly downwardly-directed tangential admission] (fluid dynamics in general [F15D](#)) [C9411]
- B04C5/04** . . Tangential inlets
- B04C5/06** . . Axial inlets
- B04C5/08** . Vortex chamber constructions
- B04C5/081** . . Shapes or dimensions
- B04C5/085** . . with wear-resisting arrangements
- B04C5/087** . . with flexible gas-tight walls
- B04C5/10** . . with perforated walls
- B04C5/103** . . Bodies or members, e.g. bulkheads, guides, in the vortex chamber (cores [B04C5/107](#))
- B04C5/107** . . Cores; Devices for inducing an air-core in hydrocyclones (forming part of the outlet pipe [B04C5/13](#))
- B04C5/12** . Construction of the overflow ducting, e.g. diffusing or spiral exits

- B04C5/13
 - . . formed as a vortex finder and extending into the vortex chamber [N: (exits with bulkheads preventing reverse flow vortex [B04C3/00](#))]; Discharge from vortex finder otherwise than at the top of the cyclone; Devices for controlling the overflow
- B04C5/14
 - . Construction of the underflow ducting; Apex constructions; Discharge arrangements; [N: discharge through sidewall provided with a few slits or perforations (provided with a great number of slits or perforations [B04C5/10](#))]
- B04C5/15
 - . . with swinging flaps or revolving sluices; Sluices; Check-valves
- B04C5/16
 - . . with variable-size outlets from the underflow ducting
- B04C5/18
 - . . with auxiliary fluid assisting discharge
- B04C5/181
 - . . Bulkheads or central bodies in the discharge opening
- B04C5/185
 - . . Dust collectors
- B04C5/187
 - . . . forming an integral part of the vortex chamber
- B04C5/20
 - . with heating or cooling, e.g. quenching, means
- B04C5/22
 - . with cleaning means
- B04C5/23
 - . . using liquids
- B04C5/24
 - . Multiple arrangement thereof [N: (combination types according to other /00 groups, [B04C7/00](#))]
- B04C5/26
 - . . for series flow
- B04C5/28
 - . . for parallel flow
- B04C5/30
 - . . Recirculation constructions in or with cyclones which accomplish a partial recirculation of the medium, e.g. by means of conduits
- B04C7/00**

Apparatus not provided for in group [B04C1/00](#), [B04C3/00](#), or [B04C5/00](#); Multiple arrangements not provided for in one of the groups [B04C1/00](#), [B04C3/00](#), or [B04C5/00](#); Combinations of apparatus covered by two or more of the groups [B04C1/00](#), [B04C3/00](#), or [B04C5/00](#) [C9411]
- B04C9/00**

Combinations with other devices, e.g. fans, [N: expansion chambers, diffusors, water locks] (with filters [B01D50/00](#)) [C9411]
- B04C11/00**

Accessories, e.g. safety or control devices, not otherwise provided for [N: e.g. regulators, valves in inlet or overflow ducting] (with electrostatic precipitating arrangements [B03C3/14](#)) [C9411]