## Task:

**Application field:** Mineralogy / Metallurgy

**Material:**
1. Tungsten carbide powder (WC);
2. Tungsten carbide powder + cobalt (WC + Co)

**Feed size:** 0-100 µm

**Feed quantity:** 10 ml (each sample) + 10 ml isopropanol

**Material specification(s):** hard brittle, tough

**Customer requirement(s):** Colloidal grinding, particle size 200 - 500 nm

**Subsequent analysis:** not defined

## Solution:

**Selected instrument(s):** PM 200 Planetary Ball Mill

**Configuration(s):** 2 x grinding jar, 50 ml tungsten carbide (WC) in each jar 25 ml grinding balls of Ø 3 mm WC (= 200 g)

**Parameter(s):** Revolution speed 500 min⁻¹; reverse mode

**Time:** 10 h (per sample)

**Achieved result(s):**
1. (WC) powder: $d_{50} = 170$ nm
2. (WC + Co) powder: $d_{50} = 570$ nm
   Particle size analysis by HORIBA-Laser LA-920

**Remark(s):** For colloidal grinding (wet grinding), each grinding jar was filled additional with 10 ml isopropanol. During grinding a temperature increase due to internal friction effects appears. The safety closure device was used.

**Recommendation:** For the fine grinding of hard brittle, tough tungsten carbide powders our Planetary Ball Mill PM 200 is suitable under the above mentioned conditions.