

Needs & Motivation

concerning liquid density measurement capabilities

Emerging NMIs/Countries

- **Implement/improve** measurement capabilities (1st and 2nd levels)
- Demonstrate **competence** and **comparability** of these measurements results
- Provide **new measurements, calibrations services and CRMs** to accredited laboratories, research centres and industries

European Community

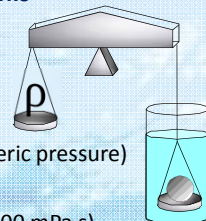
- **Increase knowledge/expertise** on liquid density metrology and on the temperature, pressure, viscosity and viscoelasticity effects
- **Enhance competitiveness and confidence** of the national industries (e.g. oil and prepackaged food) by producing accurate density measurements fulfilling the **European Directives and National Laws**
- **Update of international standards and reference documents** used in Legal Metrology regarding the use of oscillation-type density meters
- **Guidance documents** for the metrological, scientific and industrial communities

Objectives

A. Implement/improve the national measurement capabilities in liquid density metrology in emerging (8) NMIs

Density: [600; 1 700] kg/m³

Temperature: [5; 60] °C



- **Hydrostatic weighing method** (1st level)
 - Intended U : [0.002; 0.005] kg/m³ (at atmospheric pressure)
- **Oscillation-type density meters** (2nd level)
 - Viscosity: [0.7; 2 000] mPa s (ideally up to 10 000 mPa s)
 - Intended U : [0.010; 0.050] kg/m³ (at atmospheric pressure)
 - Intended U : [0.10; 0.50] kg/m³ ([1; 600] bar, at 20 °C)
- **Robustness of 1st and 2nd level measuring methods**
- **Production of density CRMs**

B. Establish the degree of equivalence of liquids density measurements (via comparisons)

C. Develop individual strategies for the long-term operation of the developed capabilities

Consortium

- **12 Partners** (11 NMIs & 1 density meters manufacturer); **19 Collaborators**; **Project advisory board**
- **Leading European representation**: 3 experienced NMIs (BEV-PTP, GUM and PTB); density meters manufacturers; Legal Metrology Organizations; Standardization & Accreditation Institutes; Inspection Authorities; Industries (oil & food)

