

## Challenge

The Belarusian State Institute of Metrology (BelGIM) in Minsk faced the task of creating a national liquid density reference standard. This required the precise transfer of density values from a 1 kg silicon sphere (of HÄFNER as a reference standard of density) with PTB calibration to areometers. Critical to the success of the project was the use of the highest quality equipment to guarantee the accuracy and reliability of the measurements.

## Solution

BelGIM trusted the experience and reputation of RADWAG, a leader in the manufacture of precision weighing equipment. At the core of the measurement system was RADWAG's AGV4-1000 mass comparator ensuring the highest weighing accuracy. In order to meet the requirements of the project, a Tamson circulating bath was additionally used to guarantee temperature stability during measurements. The whole system was installed in a climatic chamber, which is also ensuring stable environmental conditions.

## Process

The process of transferring the density values consisted of weighing the silicon sphere first in air and then in a liquid of unknown density using an AGV4-1000 comparator. Then, using an XA 210.4Y Analytical Balance (also from RADWAG), reference areometers were weighed in air and in the same liquid. This made it possible to precisely determine the measuring range of the areometers and transfer the density values.

## Results

By using RADWAG's high-end equipment, BelGIM successfully created a national reference standard for liquid density. The system enables the scaling of lower grade areometers and the precise measurement of the density of various liquids in the range from 650 to 2000 kg/m<sup>3</sup>.

## Benefits

- Precision and Reliability  
RADWAG mass comparators guarantee the highest measurement accuracy, which is crucial for metrology applications.
- Stability  
The use of a Tamson circulating bath ensures stable measuring conditions.
- Versatility  
The system enables density measurement of a wide range of liquids.

## Summary

The cooperation between BelGIM and RADWAG has resulted in the creation of an advanced measuring system, constituting a national reference standard for the density of liquids. This project confirms RADWAG's position as a leader in the field of precision weighing devices and a partner in the implementation of the most demanding metrology tasks.

