

Investigation to determine penetration depth in a C14 collecting container

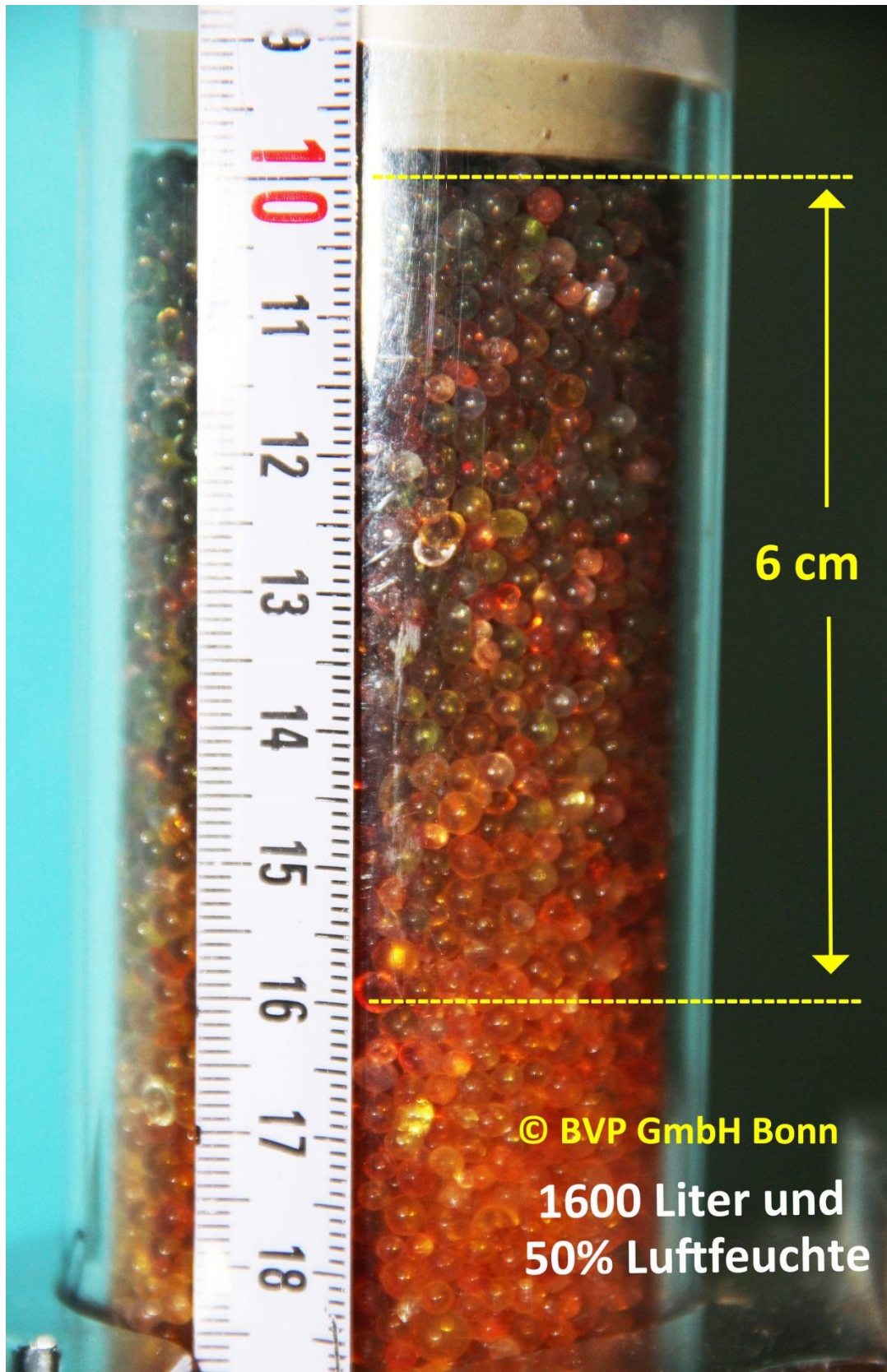


Fig. 1: 1600 litres and 50% air humidity



Fig. 2, Test arrangement



Fig. 4, Drum gas meter



Fig. 5

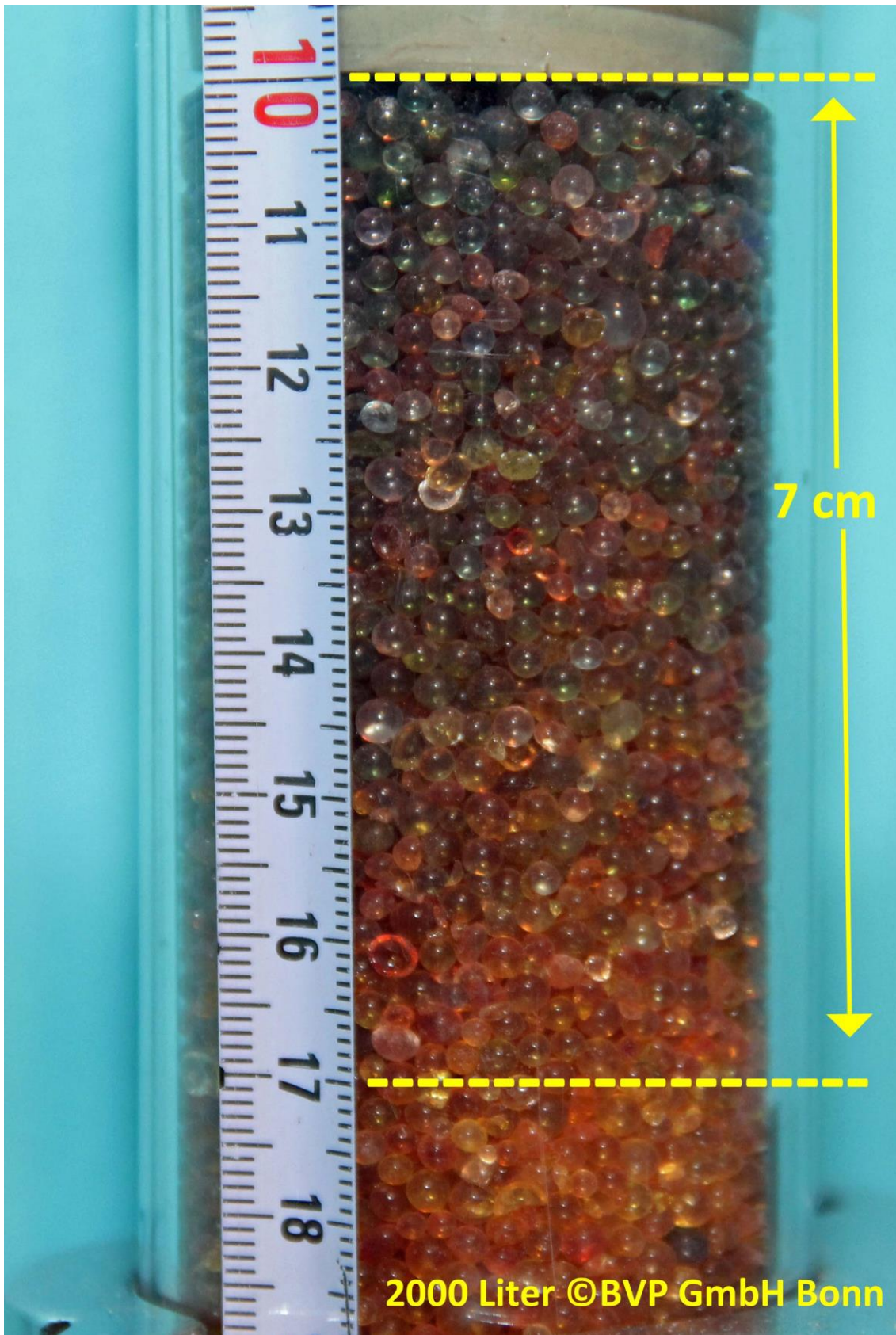


Fig. 6: 2000 litres

Often during production, assembly or maintenance of C14 collecting containers, the author asked himself how exactly the molecular sieve was penetrated. The stainless steel collection bottles used in the normal way naturally did not enable any insight into the interior. Also, after a collection period no change can be seen in the collection bottle that was used. Even if this were the case, emptying the bottle through a small 8 mm aperture mixes the molecular sieve to such an extent during the emptying process that it is impossible to designate used and unused parts.

Two measures were used for solving the problem:

1. A silica gel (Fig. 2) was used for collecting air humidity. This is generally used for drying air and it visibly changes colour when collecting moisture.
2. An acrylic glass tube (Fig. 1, 2 and 6) with a clear width of 50 mm as a collecting container, corresponding with the interior dimension of the collection bottle used as specified by the manufacturer, and a usable length of 125 mm served as the collection container.

A drum gas meter from the company Ritter Bochum (Fig. 4 after approx. 1600 litres; Fig. 5 after approx. 2000 litres) was used for measuring air volume.

A hygrometer "TFA 30 3015" from the company Dostmann/Weiden was used for measuring air humidity.

Fig. 1 and Fig. 6. show the results of the investigation. After approx. 1600 litres, respectively 2000 litres throughput with approx. 50% air humidity, the silica gel changed colour along a length of up to 60 mm and up to 70 mm.

Criticism: the test performed for the first time did not serve any scientific purpose. It was only intended to satisfy the author's curiosity regarding what actually happens during a collection period, how much molecular sieve is actually required, how much reserve of molecular height is available, and whether there is a possible risk of "bursting" through the molecular sieve?

The author René Baltus is an employee of the company BVP GmbH Bonn, and during a period of 35 years he has produced, commissioned, maintained and repaired approx. 250 C14/H3. collectors used all over the world.