

# Recovery and utilisation of nutrients for low impact fertiliser



## Technology fact sheet – Vacuum toilet

### Vacuum toilets – combining water saving and high comfort

Vacuum toilets use air to transport sewage, reducing water consumption notably. A typical flushing water volume of vacuum toilets is 0.8-1.2 litres, compared to 3-10 litres of modern gravity flush toilets. For Run4Life, an ultra-low flush toilet model was developed by JETS, working with a flushing volume as low as 0.5-0.7 litres. The lower flushing volume gives not only a notable water saving effect, but also a high concentrated sewage, which is a great advantage in terms of resource recovery. Therefore, the efficiency of fertiliser production in Run4Life is increased by using vacuum toilets.

While originally mainly found on ships, airplanes or trains, in recent years vacuum toilets met a growing attention among green building development. Vacuum sewer systems use smaller pipe dimensions and piping is more flexible than in gravity sewers. This makes vacuum toilet further interesting for renovations or special architectural designs. Accordingly, the technology faced a massive development during the last couple of years not only to reduce water consumption, but also in terms of design and noise level reduction. A modern vacuum toilet looks sophisticated and is not significantly louder than an ordinary toilet.

### Key facts

- Significant water saving (2-10 liters per flush)
- Highly concentrated sewage
- Small piping dimensions (twice as small)
- High flexibility in piping layout
- High comfort and modern design

### Application in Run4Life demonstration sites

- Input: extremely low flushing water volumes
- Output: highly concentrated sewage
- Applied in Sneek; ultra-low flush vacuum toilets
- Applied in Helsingborg and Ghent; ordinary vacuum toilets

