

A photograph of several zebrafish (Danio rerio) swimming in a clear glass tank. The fish are characterized by their yellowish-brown bodies with prominent horizontal black stripes. They are swimming in a group, and the background is a dark blue color, likely from the tank's lighting or background.

ZF-MED

ZEBRAFISH AND OTHER AQUATIC
MODELS IN MEDITERRANEAN LABS

La stabulazione dei modelli acquatici

Giornata studio sull'impiego dei Modelli Acquatici a fini scientifici
Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise
'G.Caporale'
16 Ottobre 2018

- Requisiti
- Sistemi di stabulazione
- Focus sui sistemi a ricircolo

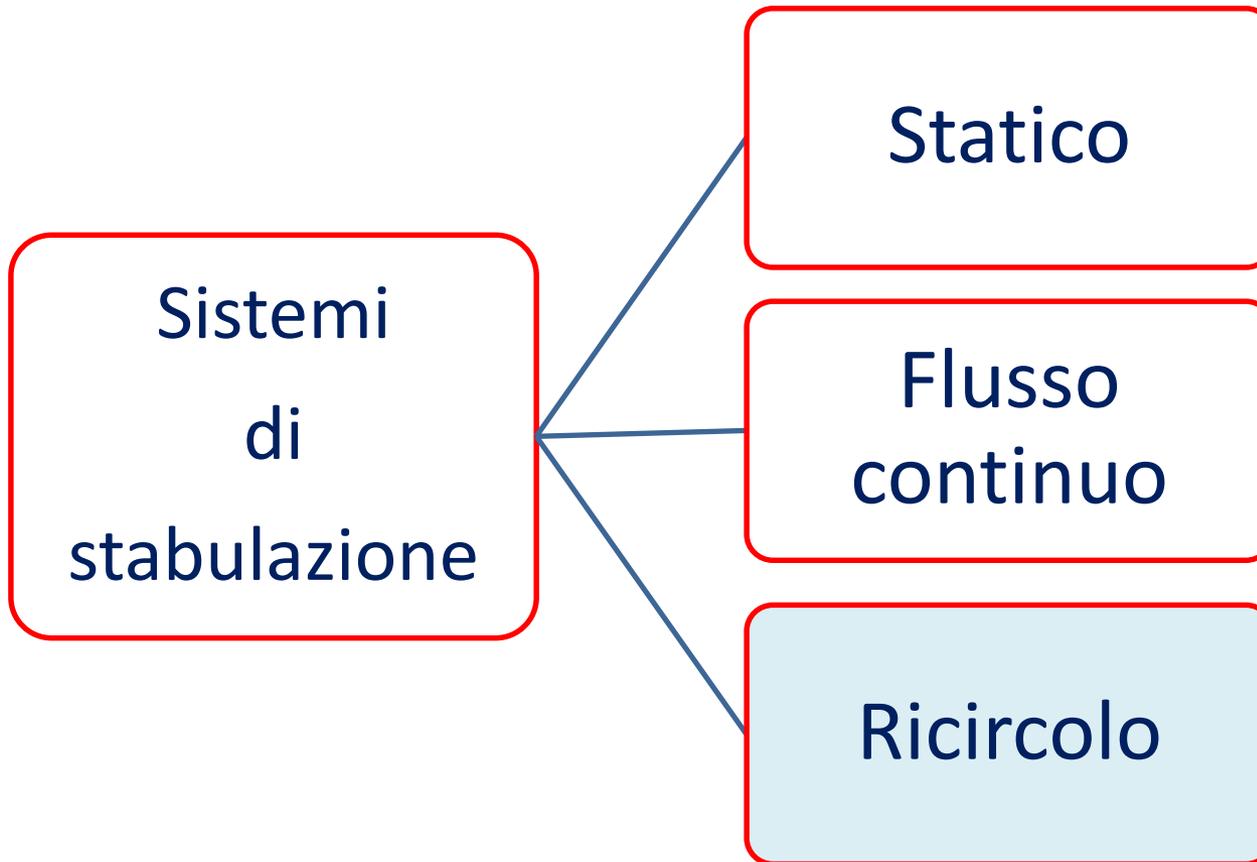


Agenda

- Rispettare le norme di legge
- Garantire l'ottimale stato sanitario degli animali stabulati
- Essere sicuro e facile da usare
- Facile da mantenere



Requisiti



Sistemi di stabulazione



Sistemi statici

Utilizzano gabbie destinate ad
altre specie animali

Principio “Fill and dump”

Impatto sulla qualità dell'acqua

Costi di gestione



Sistemi statici



Sistemi statici



Sistemi a flusso continuo

Fungicidal effects of chemical disinfectants, UV light, desiccation and heat on the amphibian chytrid *Batrachochytrium dendrobatidis*

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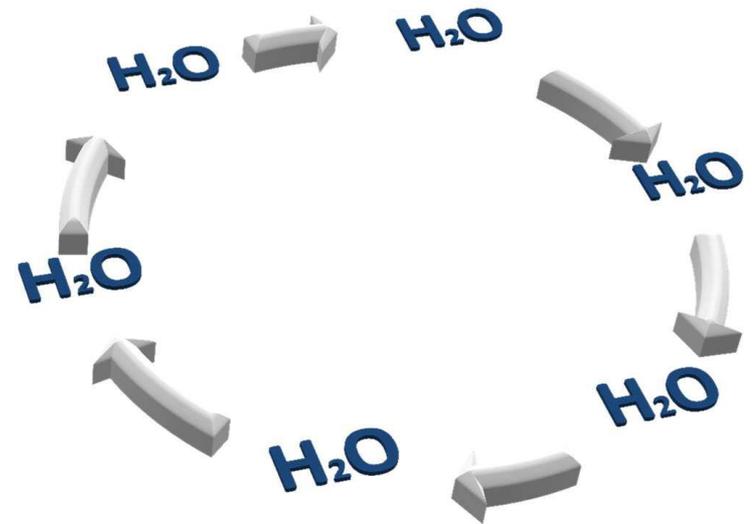
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ABSTRACT: The efficacy of a number of disinfection treatments was tested on *in vitro* cultures of the fungus *Batrachochytrium dendrobatidis*, the causative agent of chytridiomycosis in amphibians. The aim was to evaluate the fungicidal effects of chemical disinfectants, sterilising ultraviolet (UV) light, heat and desiccation, using methods that were feasible for either disinfection in the field, in amphibian husbandry or in the laboratory. The chemical disinfectants tested were: sodium chloride, household bleach (active ingredient: sodium hypochlorite), potassium permanganate, formaldehyde solution, Path-XTM agricultural disinfectant (active ingredient: didecyl dimethyl ammonium chloride, DDAC), quaternary ammonium compound 128 (DDAC), Dithane, Virkon, ethanol and benzalkonium chloride. In 2 series of experiments using separate isolates of *B. dendrobatidis*, the fungicidal effect was evaluated for various time periods and at a range of chemical concentrations. The end point measured was death of 100% of zoospores and zoosporangia. Nearly all chemical disinfectants resulted in 100% mortality for at least one of the concentrations tested. However, concentration and time of exposure was critical for most chemicals. Exposure to 70% ethanol, 1 mg Virkon ml⁻¹ or 1 mg benzalkonium chloride ml⁻¹ resulted in death of all zoosporangia after 20 s. The most effective products for field use were Path-XTM and the quaternary ammonium compound 128, which can be used at dilutions containing low levels (e.g. 0.012 or 0.008%, respectively) of the active compound didecyl dimethyl ammonium chloride. Bleach, containing the active ingredient sodium hypochlorite, was effective at concentrations of 1% sodium hypochlorite and above. Cultures did not survive complete drying, which occurred after <3 h at room temperature. *B. dendrobatidis* was sensitive to heating, and within 4 h at 37°C, 30 min at 47°C and 5 min at 60°C, 100% mortality occurred. UV light (at 1000 mW m⁻² with a wavelength of 254 nm) was ineffective at killing *B. dendrobatidis* in culture.

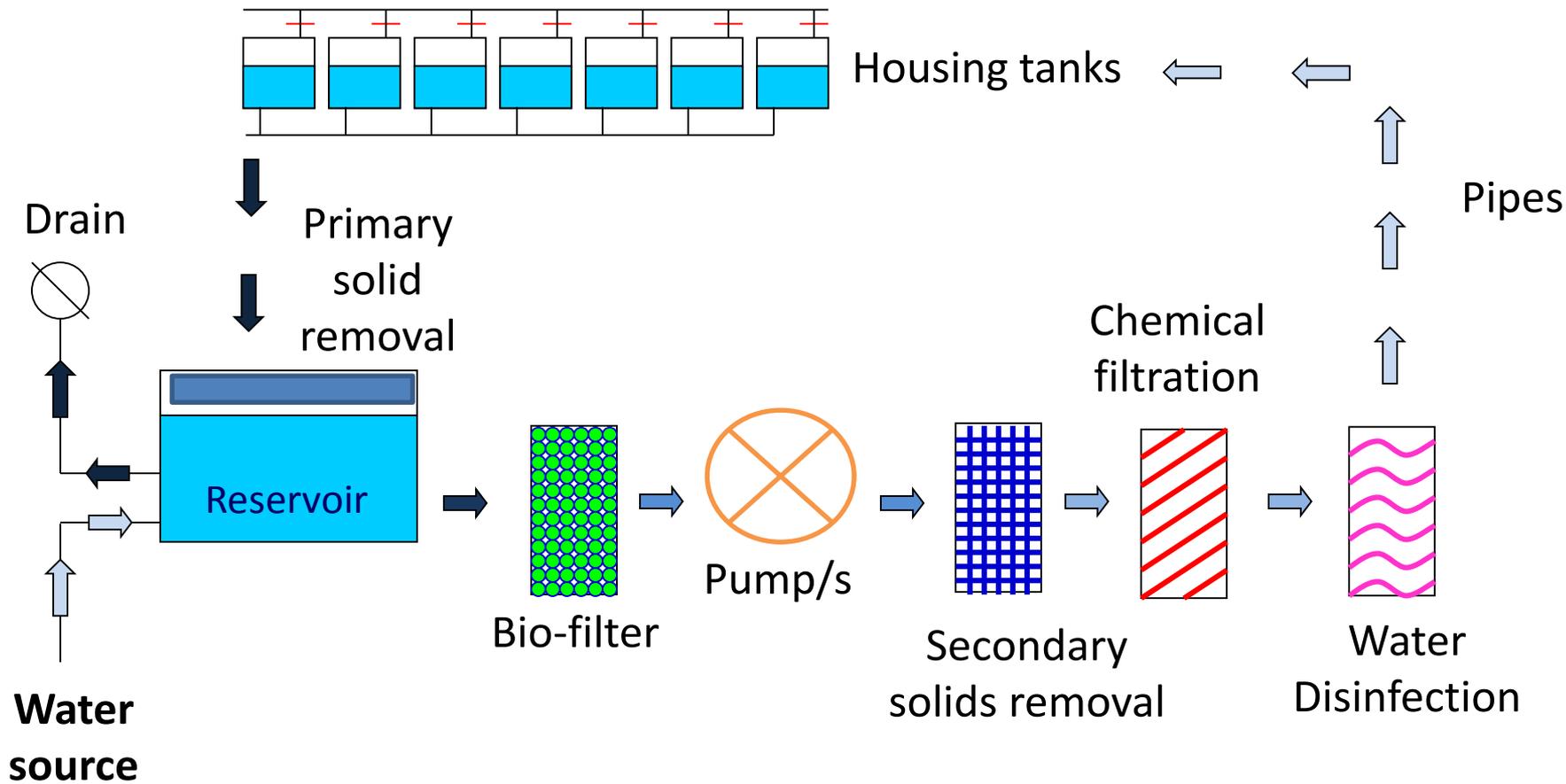
KEY WORDS: *Batrachochytrium dendrobatidis* · Disinfectant · Ultraviolet light · Didecyl dimethyl ammonium chloride · DDAC · Desiccation · Sodium hypochlorite

Sistemi a flusso continuo

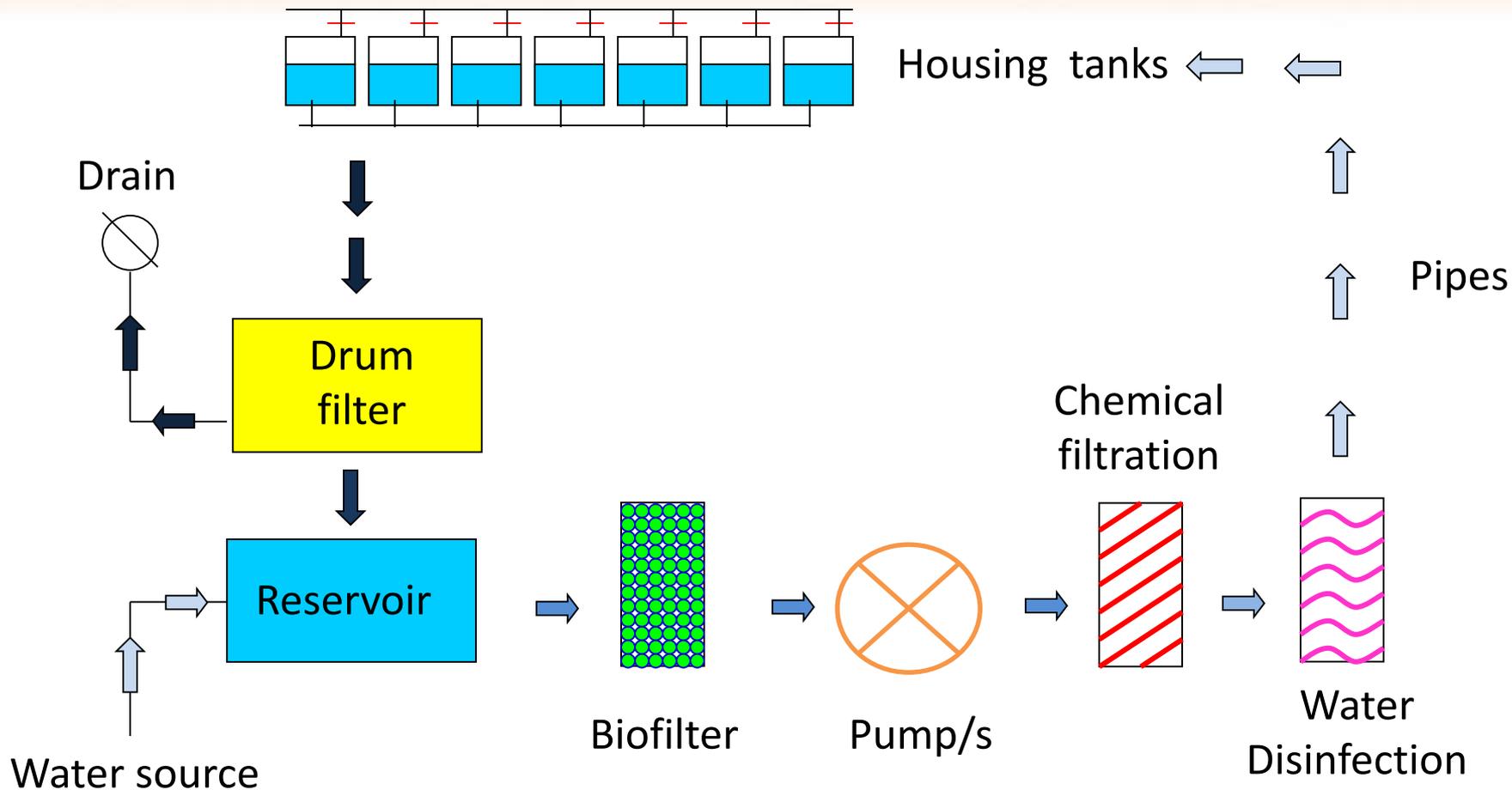
Sistemi di elezione per la stabulazione di pesci teleostei



Sistemi a ricircolo



Sistemi a ricircolo: approccio standard



Sistemi a ricircolo: approccio self-cleaning



Grouping



Stocking

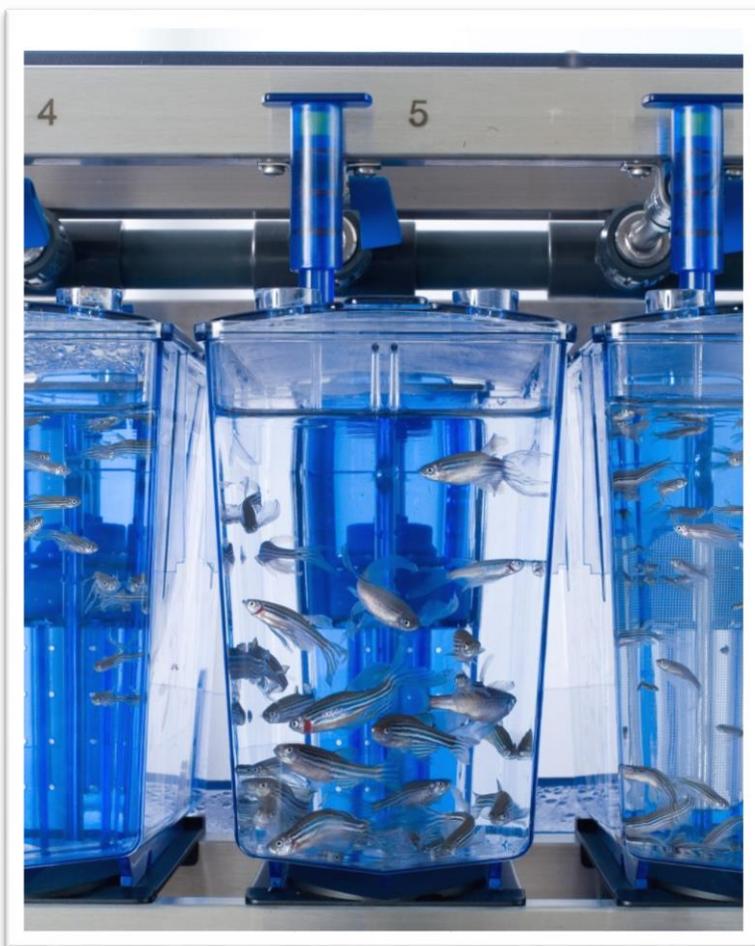


Isolation

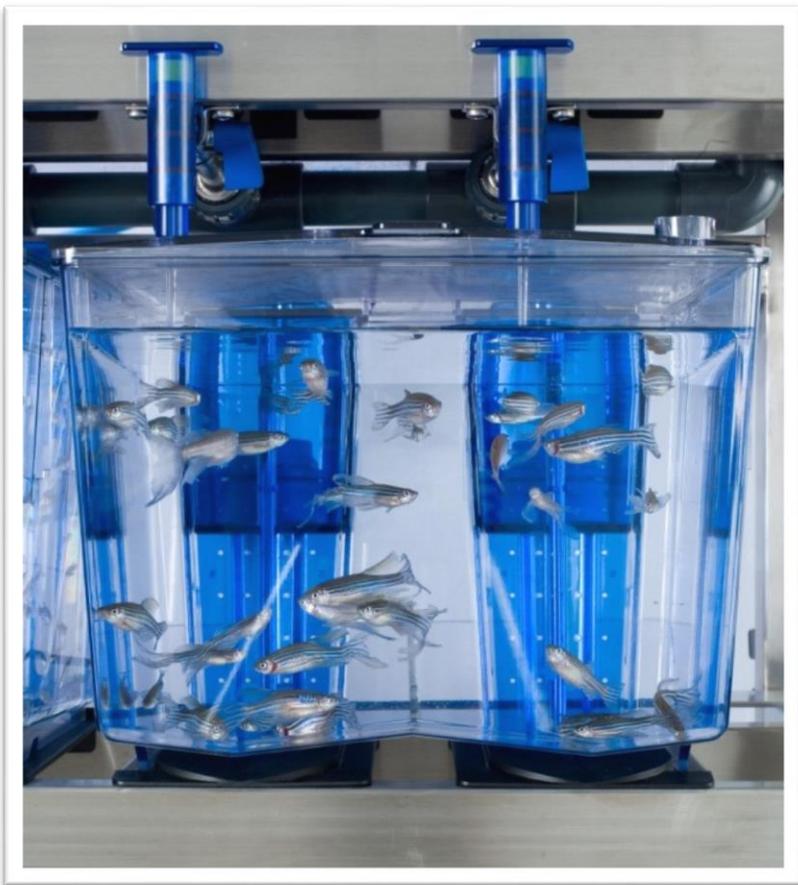


Isolation/fry rearing

Sistemi a ricircolo: le vasche di stabulazione



Sistemi a ricircolo: le vasche di stabulazione



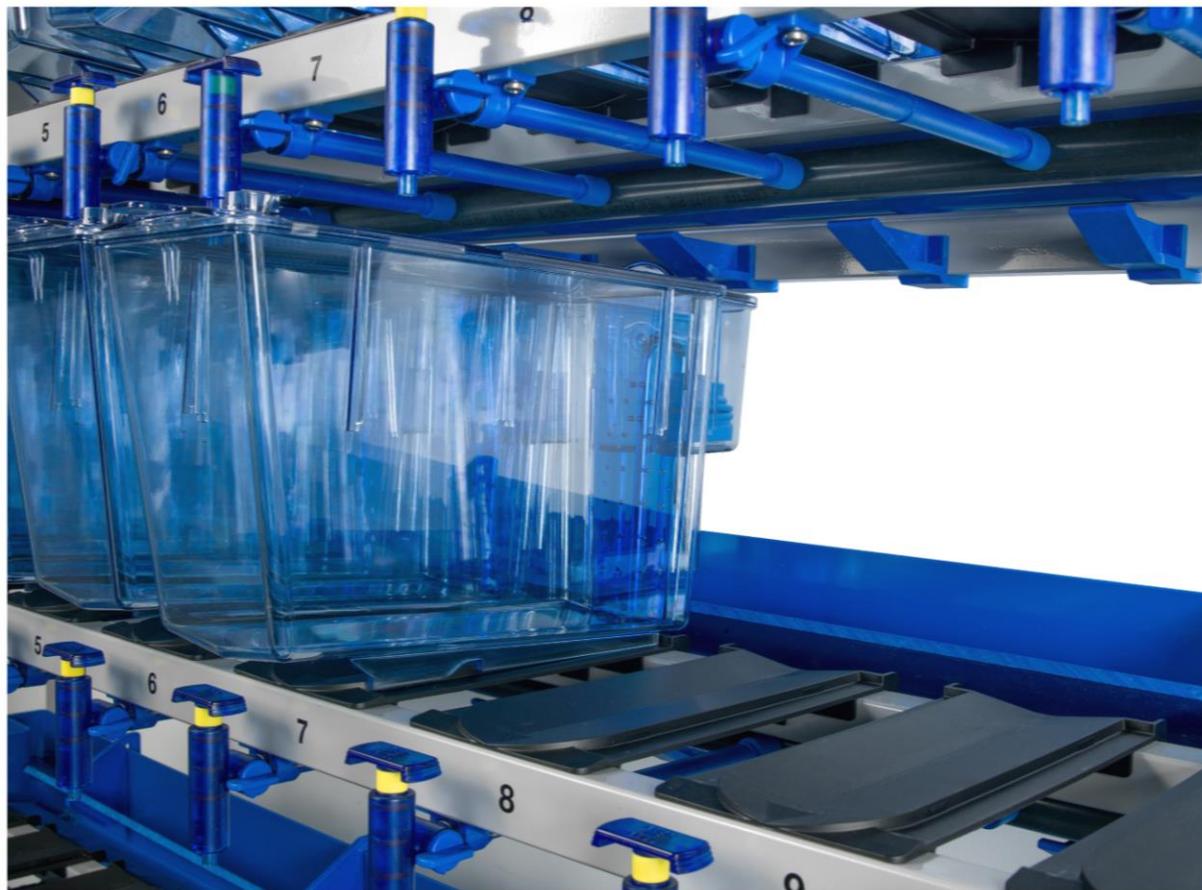
Sistemi a ricircolo: le vasche di stabulazione



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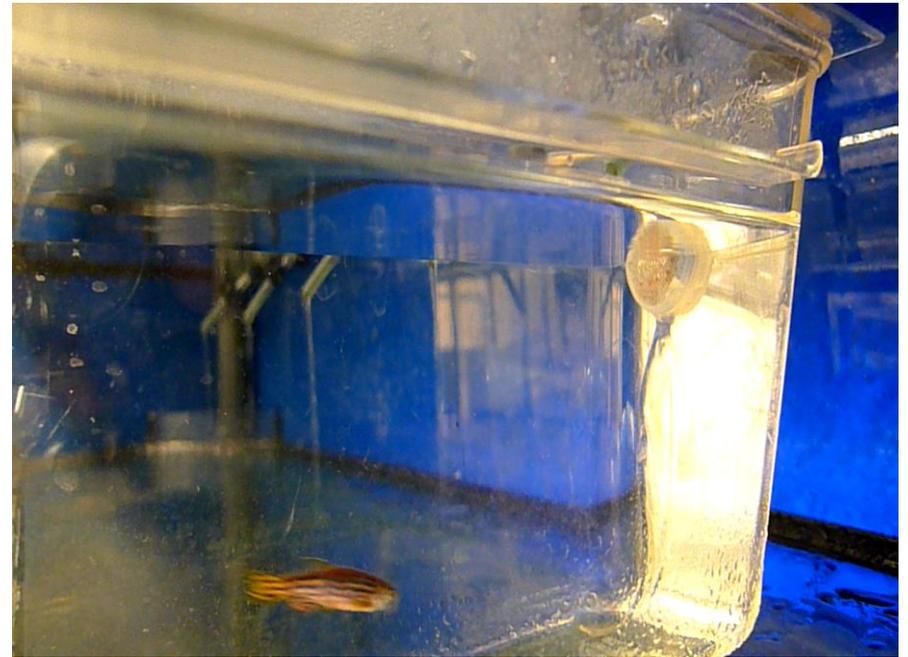
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Sistemi a ricircolo: le vasche di stabulazione

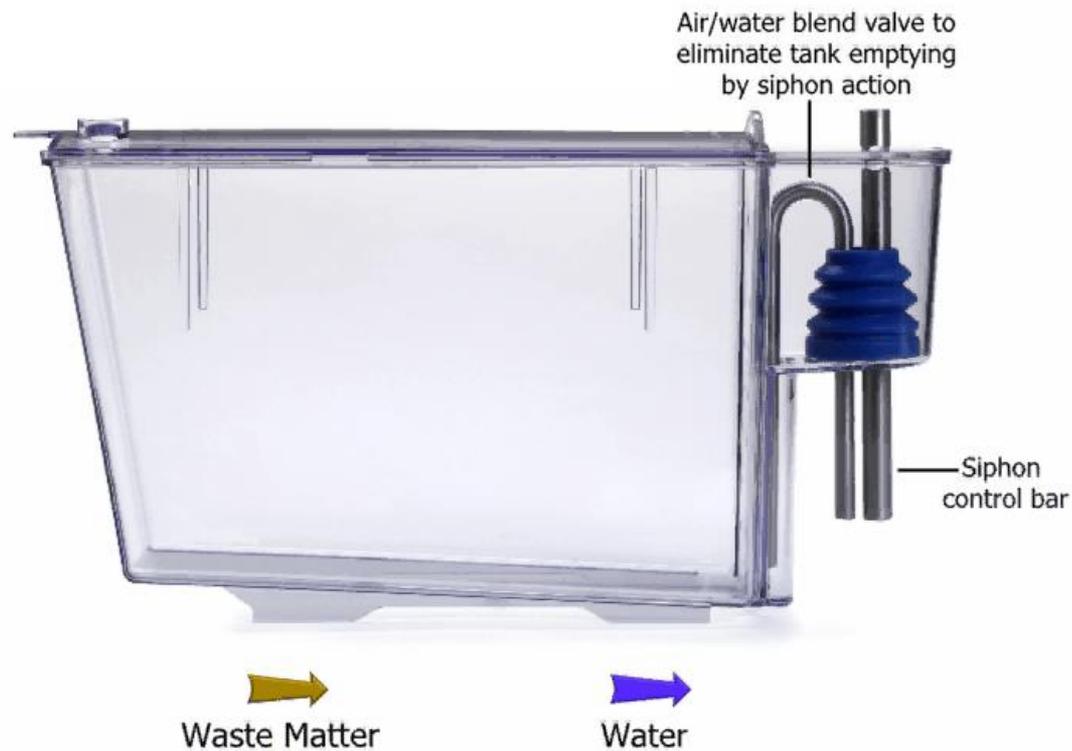


Sistemi a ricircolo: le vasche di stabulazione

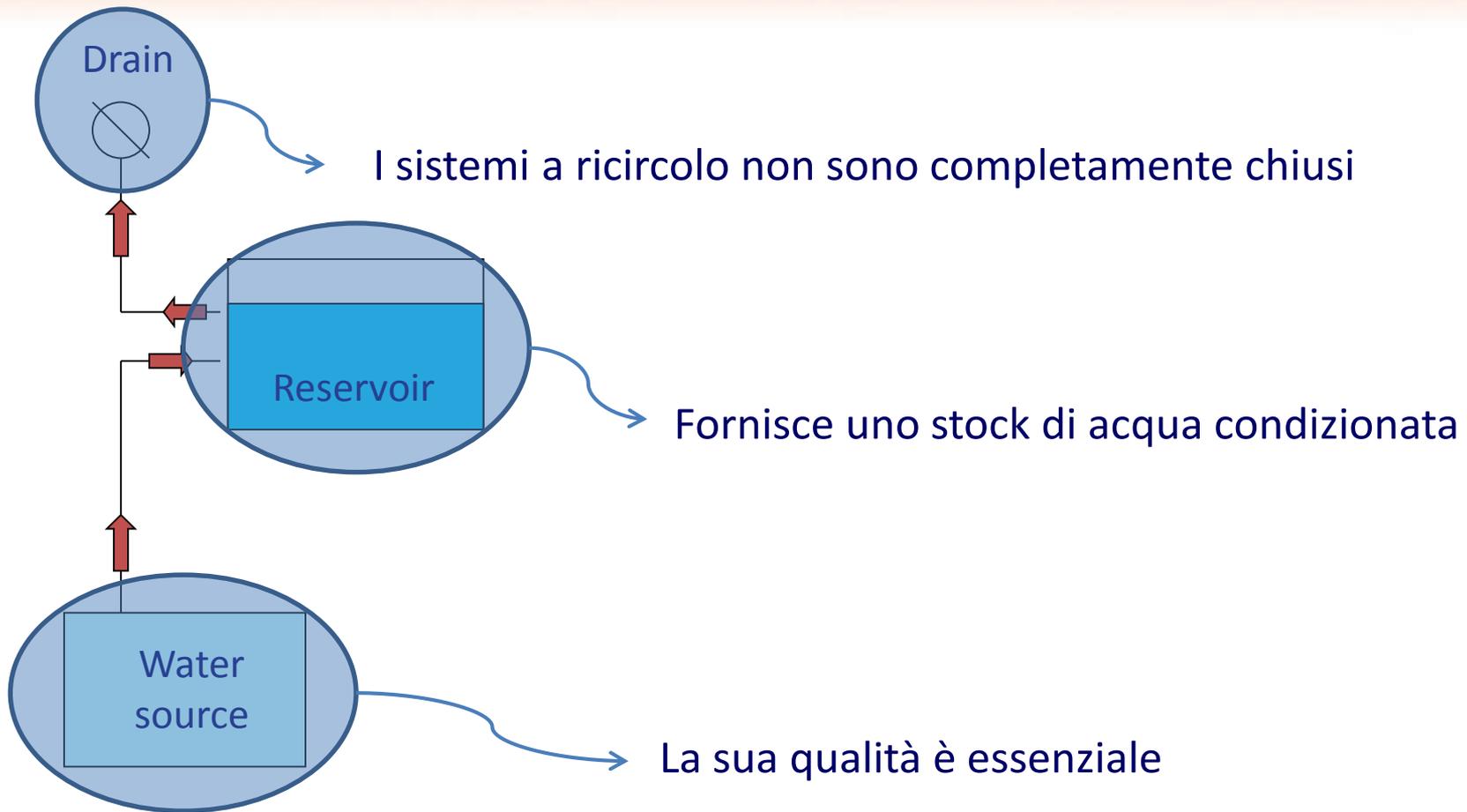
From the APPENDIX A of ETS 123:

“All the enclosure should be kept free of fish waste products or uneaten food. If these are allowed to accumulate, water quality and thus fish health will be adversely affected”

Sistemi a ricircolo: le vasche di stabulazione



Sistemi a ricircolo: le vasche di stabulazione

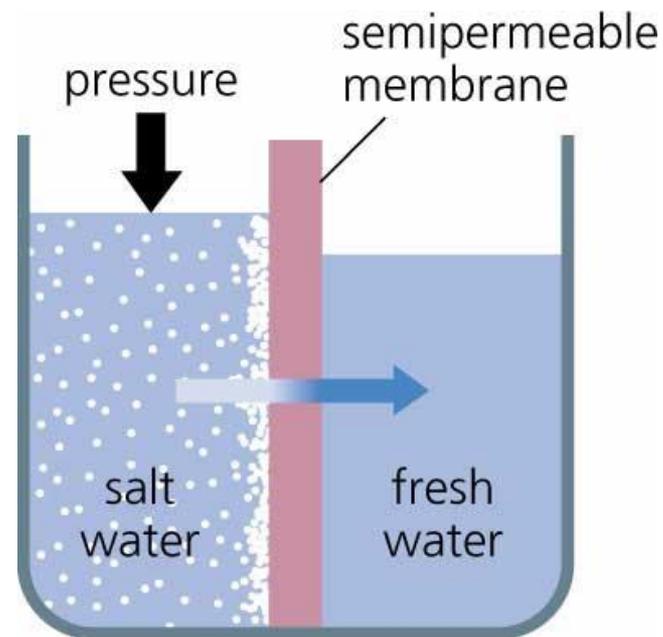


Sistemi a ricircolo:
scarico, reservoir, acqua di alimentazione

Acqua di rete



Osmosi inversa



Sistemi a ricircolo: acqua di alimentazione



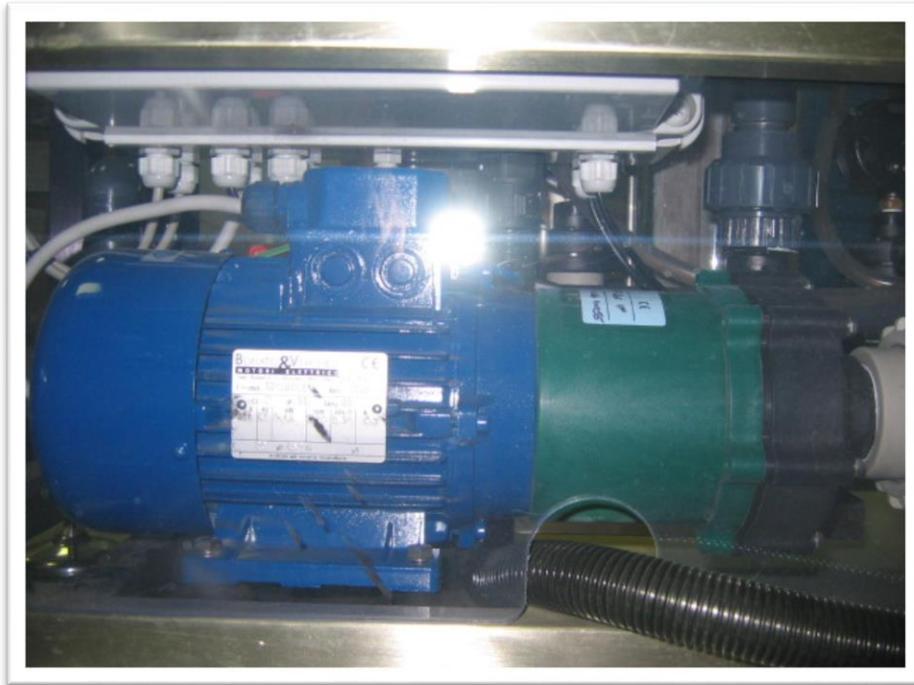
Sistemi a ricircolo: acqua di alimentazione



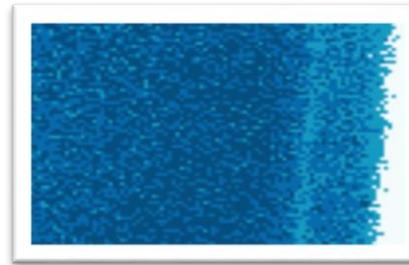
Sistemi a ricircolo: pre-filtrazione



Sistemi a ricircolo: pre-filtrazione



Sistemi a ricircolo: pompa/e di ricircolo



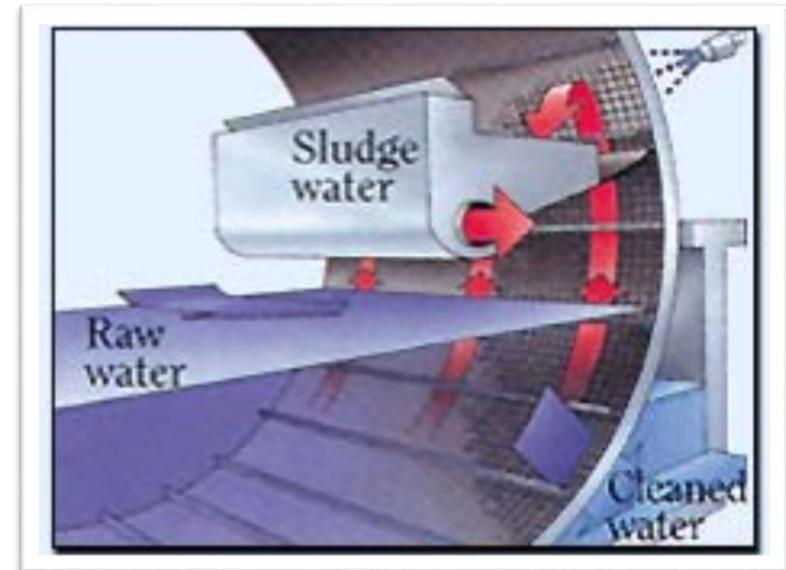
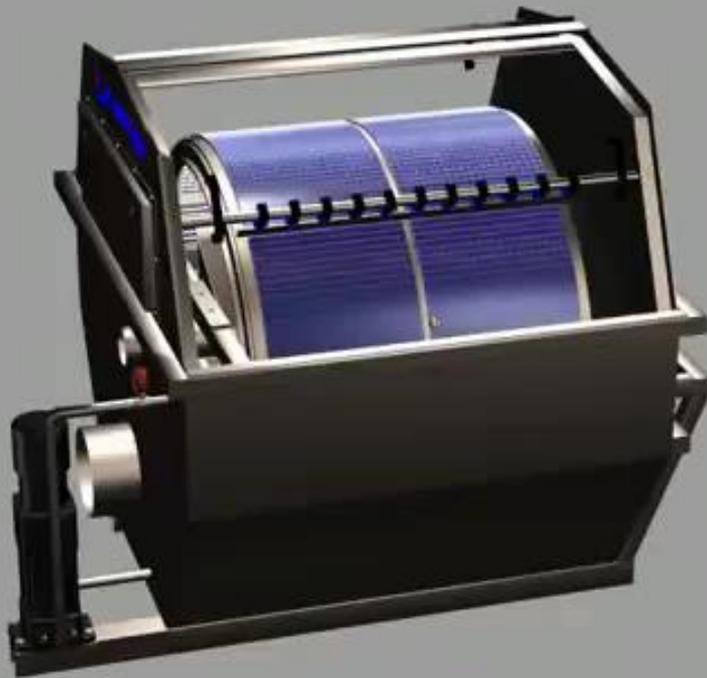
Sistemi a ricircolo: il bio-filtro



Sistemi a ricircolo: il bio-filtro



Sistemi a ricircolo:
la filtrazione meccanica_approccio standard



Sistemi a ricircolo:
la filtrazione meccanica _approccio self-cleaning



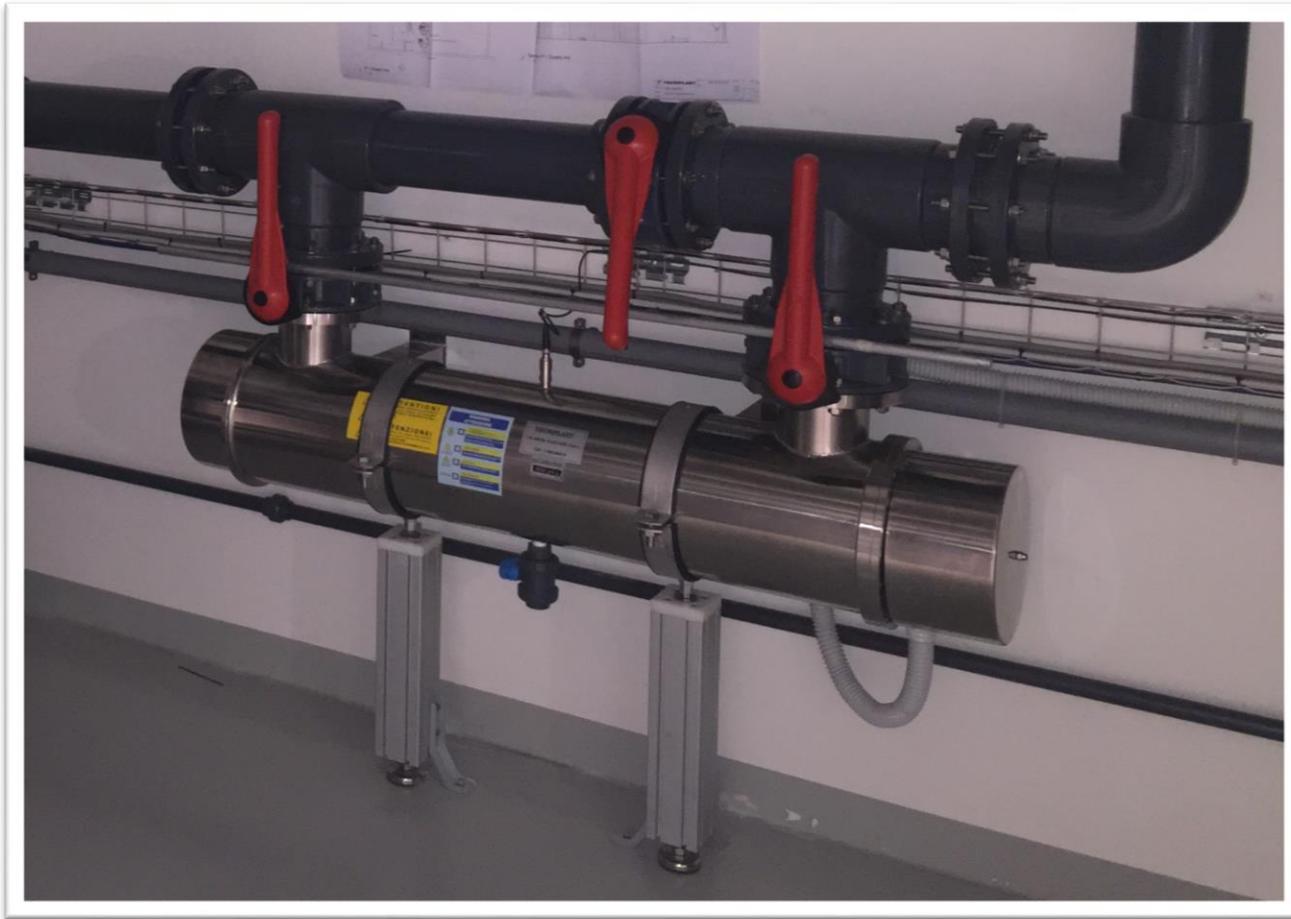
Sistemi a ricircolo:
la filtrazione meccanica _approccio self-cleaning



Sistemi a ricircolo:
la filtrazione meccanica_ approccio self-cleaning



Sistemi a ricircolo: la filtrazione a carbone



Sistemi a ricircolo: la disinfezione UV



Sistemi a ricircolo: sistemi di stabulazione



Sistemi a ricircolo: sistemi di stabulazione



Sistemi a ricircolo: sistemi di stabulazione



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