This report summarizes the evaluation results of a coagulant/flocculant-disinfectant known by the tradename ‘P&G Purifier of Water’ under Round I of the World Health Organization (WHO) International Scheme to Evaluate Household Water Treatment Technologies (the Scheme). Evaluation followed the requirements of the WHO protocol for coagulation/flocculation-disinfection technologies, and comprised a desk review of existing laboratory data on the product’s performance against bacteria, viruses and protozoa. Based on the review of existing data, the product meets WHO performance criteria and is classified as providing Comprehensive protection (★★).
Background

Evaluation under the Scheme is based on performance criteria set out in *Evaluating Household Water Treatment Options: Health-based targets and microbiological performance specifications* (WHO, 2011). The criteria were determined by applying quantitative microbial risk assessment methods outlined in the WHO *Guidelines for Drinking-water Quality* (2011) and set out log_{10} reduction targets against bacteria, viruses and protozoa (Table).

### WHO performance criteria for household water treatment technologies

<table>
<thead>
<tr>
<th>Performance classification</th>
<th>Bacteria (log_{10} reduction required)</th>
<th>Viruses (log_{10} reduction required)</th>
<th>Protozoa (log_{10} reduction required)</th>
<th>Interpretation (with correct and consistent use)</th>
</tr>
</thead>
<tbody>
<tr>
<td>★★★</td>
<td>≥ 4</td>
<td>≥ 5</td>
<td>≥ 4</td>
<td>Comprehensive protection</td>
</tr>
<tr>
<td>★★</td>
<td>≥ 2</td>
<td>≥ 3</td>
<td>≥ 2</td>
<td>Targeted protection</td>
</tr>
<tr>
<td>★</td>
<td></td>
<td></td>
<td></td>
<td>Meets at least 2-star (★★) criteria for two classes of pathogens</td>
</tr>
<tr>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td>Fails to meet criteria for 1-star (★)</td>
</tr>
</tbody>
</table>

Product description

The P&G Purifier of Water is a sachet containing powdered ferric sulfate and calcium hypochlorite. The ferric sulfate acts as a coagulant and aggregates suspended particulates and larger microbes. The resulting floccules then settle to the bottom of the water container. The calcium hypochlorite acts as a disinfectant. The product is available in 4g sachets that can each treat 10 L of water. The full product description, illustrations and use instructions can be found at: www.pg.com.

Evaluation approach

The laboratory data reviewed for the product were for performance against bacteria (*Escherichia coli*, *Salmonella enterica*, *Vibrio cholerae* and *Raoultella terrigena*), viruses (*Poliovirus* and *Rotavirus*) and protozoa (*Giardia muris* cysts and *Cryptosporidium parvum* oocysts), based on the United States Environmental Protection Agency (US EPA) *Guide Standard for Microbiological Water Purifiers* (1987). The submitted data were reviewed against the technology test protocol for Chlorine Disinfection Technologies V 1.0 (2015).

Results

The test organisms and test procedure applied to generate the existing laboratory data were deemed comparable to those of the Scheme and sufficient to determine the performance of the product. Based on the review, the P&G Purifier of Water meets or exceeds the minimum performance targets for bacteria, viruses and protozoa.
Interpretation and application of results

Performance is classified in three ascending tiers: ★ (one-star), ★★ (two-star) and ★★★ (three-star), as shown in the table. Both three- and two-star products provide Comprehensive protection against all three microbial groups. One-star products meet performance targets for only two of the three microbial groups, providing Targeted protection.

Performance classification

Based on the review of the laboratory data submitted, the P&G Purifier of Water meets or exceeds minimum performance targets for bacteria, viruses and protozoa. As such, it is classified as providing Comprehensive protection (★★★).

Considerations for product selection

<table>
<thead>
<tr>
<th>Microbial conditions</th>
<th>Effective against bacteria, viruses and protozoa; can be used under all microbial water quality conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physicochemical water characteristics</td>
<td>Can be used in both turbid and non-turbid water</td>
</tr>
<tr>
<td>Product information and labelling</td>
<td>Check that the device is appropriately labelled and has clear instructions for use</td>
</tr>
</tbody>
</table>

References


Disclaimer

Reference to any company or product in this report, particularly those listed in any of the figures and tables, does not constitute an endorsement, certification or warranty of fitness by WHO of such company or product for any purpose, and does not imply any preference over companies or products of a similar nature that are not mentioned.

WHO does not warrant that any products included in the figures and tables are of acceptable quality; have obtained regulatory approval in any country; or that their use is otherwise in accordance with the national laws and regulations of any country, including but not limited to patent laws. Evaluation under the Scheme is intended to guide UN Member States and procuring UN agencies in the selection of household water treatment (HWT) technologies. Inclusion of any products in this report, particularly in any of the figures and tables listed in the report, does not imply any approval by WHO of these products (which is the sole prerogative of national authorities).

The results in this report reflect the performance level that the product was found to meet at the time of testing. WHO cannot guarantee that the products reported herein will continue to meet the stated performance levels. Furthermore, the results contained in this report may not be used by manufacturers, suppliers or any other parties for commercial or promotional purposes.

For more information, contact:
World Health Organization
Water, Sanitation, Hygiene and Health Unit
Department of Public Health, Environmental and Social Determinants of Health
20, Avenue Appia
1211 Geneva 27
Switzerland

Email: hhwater@who.int