Securing top grade drinking water through highly effective disinfection unit

Hycleen Des 30
for an environmentally friendly, electroactivated disinfection with natriumhypochlorit
Top grade drinking water is vital

Top grade drinking water is an essential prerequisite for a healthy life and economic prosperity since this key resource—sometimes also called “blue gold”—cannot be simply substituted by any other. However, various factors increasingly impair our water quality. Drinking water of high quality and free of pathogens is indispensable for a healthy life.

Biofilm – habitat for bacterial cells in drinking water distribution
Together with the drinking water bacteria are distributed to and in every home and form a so-called biofilm wherever they find nourishment. Piping systems and valves in the domestic distribution lines provide them with ideal conditions. Long stagnation periods and water temperatures ranging from 25 to 50°C contribute to a proliferation of bacteria such as Legionella and Pseudomonas, which may cause infections in immunocompromised individuals.

A question of hygiene and prevention
In terms of hygiene and prevention high drinking water quality is particularly important in hospitals, rehabilitation centres, retirement homes, nursing homes, residential complexes, hotels, holiday resorts, sports facilities, spa baths, schools, daycare centres, administrative buildings, indoor event venues, military facilities and penal institutions.

On the other hand, maintenance of piping systems in domestic distribution lines and periodic checks of the drinking water quality tend to be neglected, with grave effects; securing top-grade drinking water often proves difficult in large residential properties. However, in view of tightened legal regulations facility operators are pushed to take measures to ensure high drinking water quality to avoid complaints, negative publicity, loss of revenue or even criminal penalties.
Four steps for optimum drinking water hygiene

The integral drinking water hygiene concept

In order to ensure high-quality drinking water at any time, the cold water as well as the hot drinking water supply needs to be considered as one integral system. That is why, with newly-built or planned properties preventive measures should be considered to minimize disturbances during operation. For existing properties preventive measures, however, should be supplemented with intervention measures.

**Ideal solution for existing properties**

The integral water hygiene concept comprises four areas: Prevention, monitoring, intervention and risk assessment. This approach to secure drinking water hygiene offers numerous advantages especially for existing properties because their given condition can be considered when restoring high-quality drinking water. As refurbishments are executed in stages, preventive measures can often be carried out only occasionally, thermal or chemical disinfection, on the other hand, are ideal in terms of intervention.

GF JRG provides the perfect solution: an environmentally friendly, highly efficient electroactivated disinfection unit - the Hycleen Des 30. Many years of experience show that this unit also treats old installation materials with care and therefore proves to be ideal for existing properties.
Hycleen Des 30 – the systematic disinfection unit

The Hycleen Des 30 unit generates the required electroactivated disinfectant with natriumhypochlorit on site. Years of experience with regard to drinking water additives have set high and unique standards.

Environmentally friendly disinfection using water and salt

The systematic solution Hycleen Des 30 uses only softened drinking water and high-purity salt to produce its highly effective disinfectant which is characterized by high reliability, minimal by-products and the lowest corrosion potential. After inoculating the drinking water with the electroactivated disinfectant, the solution is neutralized down the drain within a short time keeping the environmental impact low.

The Hycleen Des 30 unit offers facility operators key advantages when disinfecting their drinking water systems:

• Highly effective disinfectant against bacteria – small amounts are sufficient (fully compliant with the minimization principle)
• Depot effect in the entire drinking water installation system
• Approved disinfectant under Drinking Water Ordinance Sect. 11
• Low risk application; easy to use
• Low risk application – no transport/no storage of dangerous chemicals
• No micro-biologically induced corrosion
• No development of resistance in micro-organisms; biofilms are removed
• Does not impair the lifetime of GF JRG products; years of experience
• Environmentally friendly disinfectant
• Cost-effective technique
System structure for drinking water disinfection

The Hycleen Des 30 is the heart of the whole system and is automatically operated by a central control. For its use on the domestic water inlet further peripheral devices such as system separator, ion exchanger, pre-filter, flow meter, proportioning pump and feed unit must be allowed for and adjusted to the type of property.

Uncomplicated system configuration

The Hycleen Des 30 is the heart of the whole system and is automatically operated by a central control. For its use on the domestic water inlet further peripheral devices have to be allowed for and adjusted to the type of property.

The Hycleen Des 30 system comprises three tanks. The tank with Calzid-Ex is used to automatically clean the reactor at intervals. The high-purity saline solution is produced in the large tank whereas another tank contains the disinfectant.
High efficiency, long life

Numerous customers have used the electroactivated disinfectant with natriumhypochlorit for more than ten years and confirm its high efficiency against bacteria such as Legionella and Pseudomonas. Using the Hycleen Des 30 unit does not impair the lifetime of GF JRG materials - neither in cold nor in hot water lines.

Drinking water hygiene is vital in these facilities:

- Hospitals and rehabilitation centres
- Old people’s homes and nursing homes
- Residential complexes, hotels and holiday resorts
- Sports facilities
- Spa baths
- Schools and daycare centres
- Administrative buildings
- Indoor event venues
- Military facilities
- Penal institutions

References
GF JRG engineers faced special challenges when securing the drinking water quality in large existing properties such as shown in the references below:

Residential village in Germany totalling 20 houses and a central water distribution

Challenge:
Only occasionally occupied and used properties resulting in long stagnation periods of drinking water.

Hospital in Germany totalling 680 rooms

Challenge:
20-year old drinking water distribution with various microbiological loads.

Sports and Indoor Event venue St. Jakob in Basel

Challenge:
Greatly varying consumption rates of drinking water resulting in microbiological loads in the course of years.
Specifications

The Hycleen Des 30 unit generates an natriumhypochlorit disinfectant on site that is highly effective against germs, bacteria, biofilm, and viruses.

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production volume [neutral anolyte]</td>
<td>l/h</td>
<td>30</td>
</tr>
<tr>
<td>Free chlorine in natriumhypochlorit [EN 901]</td>
<td>mg/l</td>
<td>&lt;500</td>
</tr>
<tr>
<td>Production volume NaOCl/NaOH</td>
<td>l/h</td>
<td>20/20</td>
</tr>
<tr>
<td>Disinfectant type neutral anolyte or anolyte</td>
<td></td>
<td>selectable</td>
</tr>
<tr>
<td>Connection dimension disinfectant tanks</td>
<td>DN</td>
<td>8</td>
</tr>
<tr>
<td>Drinking water inlet pressure</td>
<td>bar</td>
<td>3 - 10</td>
</tr>
<tr>
<td>System pressure</td>
<td>bar</td>
<td>1,8</td>
</tr>
<tr>
<td>Process adjuvant - high-purity saturated saline solution</td>
<td>g/l</td>
<td>0 - 2,0</td>
</tr>
<tr>
<td>Operation</td>
<td>Switch</td>
<td>4</td>
</tr>
<tr>
<td>Automatic process control</td>
<td></td>
<td>PLC</td>
</tr>
<tr>
<td>Level monitoring disinfectant, Calzid-Ex</td>
<td>Switch</td>
<td>inductive</td>
</tr>
<tr>
<td>In-process cleaning with Calzid-Ex (organic acid mixture)</td>
<td></td>
<td>automated</td>
</tr>
<tr>
<td>Consumption of Calzid-Ex</td>
<td>°C</td>
<td>15 - 35</td>
</tr>
<tr>
<td>Operating temperature in the room</td>
<td>%</td>
<td>&lt;45</td>
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<tr>
<td>Relative humidity</td>
<td></td>
<td>IP 54</td>
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<tr>
<td>Protection class</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connections</td>
<td></td>
<td></td>
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<tr>
<td>Power inlet [frequency 50 Hz]</td>
<td>V AC</td>
<td>230 ± 10%</td>
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<tr>
<td>Power consumption</td>
<td>W</td>
<td>350</td>
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<tr>
<td>Fuse</td>
<td>A</td>
<td>13</td>
</tr>
<tr>
<td>Drinking water connection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drinking water connection</td>
<td>DN</td>
<td>15, AG ½”</td>
</tr>
<tr>
<td>Drinking water volume</td>
<td>l/h</td>
<td>50</td>
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<tr>
<td>Unit feed water hardness</td>
<td>°dH</td>
<td>&lt; 1</td>
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<tr>
<td>Drinking water temperature</td>
<td>°C</td>
<td>15 - 22</td>
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<tr>
<td>Minimum drinking water pressure at the unit inlet</td>
<td>bar</td>
<td>3,0</td>
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<tr>
<td>Minimum drain connection</td>
<td>DN</td>
<td>65</td>
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<tr>
<td>Drain connection [pipe diffusion sealed]</td>
<td>DN</td>
<td>min. 20</td>
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<tr>
<td>Ventilation</td>
<td>m³/h</td>
<td>20</td>
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<tr>
<td>Saline solution tank</td>
<td>l</td>
<td>100</td>
</tr>
<tr>
<td>Natriumhypochlorit tank</td>
<td>l</td>
<td>60</td>
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<tr>
<td>Calzid-Ex tank</td>
<td>l</td>
<td>60</td>
</tr>
<tr>
<td>Dimensions [W x H x D]</td>
<td></td>
<td>1545 x 1745 x 545</td>
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<tr>
<td>Wall mounting [W x H]</td>
<td></td>
<td>1800 x 2000</td>
</tr>
<tr>
<td>Unit weight [tank empty]</td>
<td>kg</td>
<td>90</td>
</tr>
<tr>
<td>Unit weight [tank full]</td>
<td>kg</td>
<td>235</td>
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<tr>
<td>Certification</td>
<td></td>
<td>CE approved</td>
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<tr>
<td>Approval of the disinfectant</td>
<td></td>
<td>German Drinking Water Ordinance Sect. 11</td>
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<tr>
<td>Maintenance interval</td>
<td></td>
<td>annual</td>
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Additives

<table>
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<tr>
<th>Additives</th>
<th>Unit</th>
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<tr>
<td>High-purity salt</td>
<td>kg</td>
<td>25</td>
</tr>
<tr>
<td>Calzid-Ex</td>
<td>kg</td>
<td>25</td>
</tr>
</tbody>
</table>
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Our sales companies and representatives ensure local customer support in over 100 countries.

www.gfps.com

Argentina/Southern South America
Georg Fischer Central Plastics Südamérique S.R.L.
Buenos Aires, Argentina
Phone +54 (0) 9 586 58 25
info.fsp@georgfischer.com
www.gfps.com/ar

Australia
Georg Fischer Pty Ltd
Riverwood NSW 2210 Australia
Phone +61 (0) 2 9022 8000
australia.gsps@georgfischer.com
www.gfps.com/au

Austria
Georg Fischer Rohrleitungssysteme GmbH
3130 Herzogenburg
Phone +43 (0) 7161 302-0
info.de@georgfischer.com
www.gfps.com/at

Belgium/Luxembourg
Georg Fischer NV/SA
1070 Bruxelles/Bruxsel
Phone +32 (0) 2 556 40 20
info.be@georgfischer.com
www.gfps.com/be

Brazil
Georg Fischer S.A.
04795-100 São Paulo
Phone +55 11 4512 02 90
info.br@georgfischer.com
www.gfps.com/br

Canada
Georg Fischer Piping Systems Ltd
Mississauga, ON L8T 2B2
Phone +1 (905) 670 8805
info.ca@georgfischer.com
www.gfps.com/ca

China
Georg Fischer Piping Systems Ltd
Shanghai 201319
Phone +86 21 3899 3899
info.cn@georgfischer.com
www.gfps.com/ch

Denmark/Iceland
Georg Fischer A/S
2630 Taarpug
Phone +45 (0) 70 22 19 75
info.dk@georgfischer.com
www.gfps.com/dk

Finland
Georg Fischer AB
02150 VANTAA
Phone +358 (0) 9 586 58 25
Fax +358 (0) 9 586 58 29
info.fi@georgfischer.com
www.gfps.com/fi

France
Georg Fischer SAS
95932 Roissy Charles de Gaulle Cedex
Phone +33 (0) 1 41 84 68 84
fr@georgfischer.com
www.gfps.com/fr

Germany
Georg Fischer GmbH
73095 Albershausen
Phone +49 (0) 7161 302-0
info.de@georgfischer.com
www.gfps.com/de

India
Georg Fischer Piping Systems Ltd
400 076 Mumbai
Phone +91 22 4007 2001
branchoffice@georgfischer.com
www.gfps.com/in

Italy
Georg Fischer TPA S.r.l.
IT-16012 Busiana [SE]
Phone +39 016 962 47 11
it@georgfischer.com
www.gfps.com/it

Japan
Georg Fischer Ltd
556-0211 Osaka,
Phone +81 (0) 6 635 2491
jp@georgfischer.com
www.gfps.com/jp

Korea
Georg Fischer Piping Systems
271-3 Seochyon-dong Bundang-gu
Seongnam-si, Gyeonggi-do
Phone +82 31 8017 1450
Fax +82 31 8017 1454
kor@georgfischer.com
www.gfps.com/kr

Malaysia
Georg Fischer (MS) Sdn. Bhd.
40465 Shah Alam, Selangor Darul Ehsan,
Phone +60 (0) 3 5122 5585
my@georgfischer.com
www.gfps.com/my

Mexico/Northern Latin America
Georg Fischer S.A. de C.V.
Aptidaca, Nuevo Leon
CP66436, Mexico
Phone +52 (81) 1340 8586
Fax +52 (81) 1522 8906
mx@georgfischer.com
www.gfps.com/mx

Middle East
Georg Fischer
Piping Systems [Switzerland] Ltd
Dubai, United Arab Emirates
Phone +971 4 289 49 60
dfs@georgfischer.com
www.gfps.com/dm

Netherlands
Georg Fischer N.V.
8161 PA Epe
Phone +31 (0) 578 678 222
nl@georgfischer.com
www.gfps.com/nl

New Zealand
Georg Fischer Ltd
1351 Rudi
Phone +64 7 61 28 09
no@georgfischer.com
www.gfps.com/nz

Norway
Georg Fischer AS
1351 Rudi
Phone +47 67 18 29 00
no@georgfischer.com
www.gfps.com/nz

Poland
Georg Fischer Sp. z o.o.
OS-090 Sekocin Nowy
Phone +48 (0) 22 31 31 50
poland@georgfischer.com
www.gfps.com/pl

Romania
Georg Fischer
Piping Systems [Switzerland] Ltd
020257 Bucharest - Sector 2
Phone +40 (0) 21 230 53 80
ro@georgfischer.com
www.gfps.com/ro

Russia
Georg Fischer
Piping Systems [Switzerland] Ltd
Moscow 125047
Phone +7 495 258 60 80
ru@georgfischer.com
www.gfps.com/ru

Singapore
George Fischer Pte Ltd
11 Tampines Street 92, S-04–01/07
529 872 Singapore
Phone +65 678 0411
sgp@georgfischer.com
www.gfps.com/sg

Spain/Portugal
Georg Fischer S.A.
28046 Madrid
Phone +34 9 1 971 98 90
es@georgfischer.com
www.gfps.com/es

Sweden
Georg Fischer AB
117 43 Stockholm
Phone +46 (0) 8 506 775 00
info.se@georgfischer.com
www.gfps.com/se

Switzerland
Georg Fischer Rohrleitungssysteme (Schweiz) AG
8021 Schaffhausen
Phone +41 (0) 52 631 30 26
ch@georgfischer.com
www.gfps.com/ch

Taiwan
Georg Fischer Co., Ltd
San Chung Dist., New Taipei City
Phone +886 2 8512 2822
Fax +886 2 8512 2823
www.gfps.com/tw

United Kingdom/Ireland
George Fischer Sales Limited
Coventry, CV2 2ST
Phone +44 (0) 2476 535 535
uk@georgfischer.com
www.gfps.com/uk

USA/Caribbean
Georg Fischer LLC
Tustin, CA 92780-7258
Phone +1 714 731 73 88 00
Toll Free 800-854 40 90
us@georgfischer.com
www.gfps.com/us

Georg Fischer Central Plastics LLC
Shawnee, OK 74801
Phone +1 (405) 273 63 02
gfcentral@georgfischer.com
www.tamparoleplastics.com

Vietnam
George Fischer Pte Ltd
1364 Tram Vu, Ba Dinh District, Hanoi
Phone +84 4 3715 3290
Fax +84 4 3715 3285

European
Georg Fischer Piping Systems [Switzerland] Ltd
8021 Schaffhausen/Switzerland
Phone +41 (0) 52 631 30 03
Fax +41 (0) 52 631 28 93
info.expert@georgfischer.com
www.gfps.com/it

37 732 62
digital only (03.14)
© Georg Fischer JRG AG
Hauptstrasse 130
CH-4450 Sissach/Switzerland
Telefon +41 (0) 61 975 22 22
info.jrg.pc@georgfischer.com

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