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# Process Water & Waste Water Treatment

In the Food Industry



# **Dairy industry**



| Wimm Bill Dann<br>Timashevsk, Russia                      | Anaerobic-aerobic waste water treatment in diary industry Anaerobic stage ANAFIT-CS (EGSB) Aerobic treatment Post-filtration  | 84/125<br>8.6  | m³/h<br>t COD/d     |
|---|---|----------------|---------------------|
| Gefu Produktions AG<br>Rickenbach, Switzerland            | Anaerobic waste water treatment in the dairy industry Anaerobic whey fermentation MSB SBR – Reactor   | 16.3<br>10     | t COD/d<br>m³/h     |
| Emmi Milch AG<br>Dagmersellen, Switzerland                | Anaerobic / aerobic waste water pre-treatment<br>Methanisation (EGSB<br>SBR,<br>flotation, sludge dewatering  | 1,200<br>3,600 | m³/d<br>kg<br>COD/d |
| Milchwerke Berchdesgadener Land<br>Piding, Germany        | Process water treatment in the milk industry<br>Softening, reverse osmosis  | 2.2            | m³/h                |
| Staatliche Molkerei Weihenstephan<br>Freising, Germany    | Boiler feed water treatment:<br>Reverse osmosis Novalis 8102  | 2.9            | m³/h                |
| Milchwerke Fulda-Lauterbach<br>Fulda, Germany             | Process water treatment in the milk industry Reverse osmosis , softening  | 2.2            | m³/h                |
| Goldsteig Käsereien<br>Bayerwald GmbH<br>Pocking, Germany | Boiler feed water treatment:<br>Reverse osmosis Novalis   | 2.2            | m³/h                |
| Adelbyr Nordfriesland Milch<br>Nordhackstedt, Germany     | Waste water treatment in the milk industry SBR plant / direct discharger  | 1,650<br>4,950 | m³/d<br>t COD/d     |
| Sachsenmilch AG<br>Leppersdorf, Germany<br>(Müller-Milch) | Extension of a complete sewage treatment plant encl. new development Equalisation basin Flotation Sequence batch reactor Sand filter Sludge thickener Sludge dewatering | 3,000          | m³/h                |
| Hirzel<br>Hirzel, Switzerland                             | Waste water treatment in the milk industry<br>SBR plant<br>Nitrification / denitrification  | 200<br>640     | m³/d<br>t COD/d     |
| Nordmilch eG<br>Werk Seckenhausen, Germany                | Waste water treatment in the milk industry Aerobic pre-treatment  | 62<br>2,500    | m³/h<br>kg COD/     |
| Milchwerke Regensburg<br>Regensburg, Germany              | Process water treatment in the milk industry desalination   | 13.0<br>2,500  | m³/h<br>kgCOD/      |

1E630 Food Ind Rev 11 Page: 2 Of: 8 Date: 09/11/2016

| Client                              | Plant Type  | Capacity     |                      |
|-------------------------------------|---|--------------|----------------------|
| Westmilch                           | Waste water treatment in the milk industry SBR plant / modification of a compact unit direct discharger                         | 600          | m³/d                 |
| Everswinkel, Germany                |   | 1,800        | t COD/d              |
| Westmilch                           | Waste water treatment in the milk industry SBR plant / direct discharger  | 1,650        | m³/d                 |
| Klatzow, Germany                    |   | 4,950        | t COD/d              |
| Sachsenmilch (Müller-Milch)         | Waste water treatment in the milk industry SBR plant  | 2,400        | m³/d                 |
| Leppersdorf, Germany                |   | 7,200        | t COD/d              |
| Molkerei Zott<br>Mertingen, Germany | Aerobic waste water treatment with anaerobic sludge stabilisation: Bio-P, nitrification, denitrification Fermentation of sludge | 100<br>2,950 | m³/h<br>kg<br>BOD5/d |
| Alois Müller (Müller-Milch)         | Waste water treatment in the milk industry SBR plant  | 1,500        | m³/d                 |
| Aretsried, Germany                  |   | 4,050        | t COD/d              |
| Operation Survey for W              | <u>WTP</u>  |              |                      |
| Emmi Milch AG                       | Anaerobic/ aerobic waste water pre-treatment Methanisation (EGSB) SBR, flotation, sludge dewatering                             | 1,200        | m³/d                 |
| Dagmersellen, Switzerland           |   | 3,600        | kg COD/d             |

1E630 Food Ind Rev 11 Page: 3 Of: 8 Date: 09/11/2016

## **Sugar industry**





| Nordic Sugar  | Anaerobic waste water treatment in the sugar                   | 100       | m³/h                |
|---|--|-----------|---------------------|
| Kedainiai, Lithuania                                | industry   | 20        | t COD/d             |
|   | Anaerobic stage ANAFIT-CS                                      |           |                     |
|   | Thickener, biogas treatment                                    |           |                     |
| Nordzucker  | Anaerobic waste water treatment in the sugar                   | 80        | m³/h                |
| Klein Wanzleben, Germany                            | industry   | 2,880     | t COD/d             |
| •   | Anaerobic stage ANAFIT-CS                                      |           |                     |
|   | Thickener, biogas treatment                                    |           |                     |
| Golden Sugar Refinery                               | Aerobic waste water treatment in the sugar industry            | 40        | m³/h                |
| Lagos, Nigeria                                      | 2 stage moving bed reactor BIOFIT-H                            | 2,880     | kg                  |
|   | with activated sludge reactor                                  | _,        | COD/d               |
|   | Sludge dewatering with belt filter press                       |           |                     |
| Dakahlia Sugar Company                              | Anaerobic-aerobic waste water treatment in the sugar           |           |                     |
| Belkas, Egypt                                       | industry   | 373       | m³/h                |
| Deikas, Egypt                                       | Brukner mud sludge dewatering                                  | 30        | t COD/c             |
|   | Anaerobic stage ANAFIT-CS                                      | 864       | kg KN /d            |
|   | Activated sludge reactor with nitrification / denitrification  |           |                     |
| Tambovskaya   | Anaerobic-aerobic waste water treatment in the sugar           |           |                     |
| Tambovskaya<br>Tambov, Russia                       | industry   | 300       | m³/h                |
| Tambov, Russia                                      | Anaerobic treatment (ANAFIT-CS)                                | 36        | t COD/              |
|   | Aerobic waste water (two stage Nitrification /                 | 300       | m³/h                |
|   | denitrification)   | 0.95      | t KN/d              |
|   | Nitrification / denitrification two stage                      |           | ******              |
|   | Post treatment -filtration / aeration                          |           |                     |
| Nile Sugar Company                                  | Anaerobic-aerobic waste water treatment in the sugar           |           |                     |
| Cairo, Egypt  | industry   | 26        | tCOD/d              |
|   | Brukner mud sludge dewatering – ANAFIT-CS                      | 240       | tTSS/d              |
|   | Activated sludge reactort with nitrification / denitrification | 140/330   | m³/h                |
| Konya Seker Fabrikasi                               | Anaerobic-aerobic waste water treatment                        | 150       | m³/h                |
| Cumra, Turkey                                       | ANAFIT CS  | 380       | m³/h                |
| Caa, .acj   | Extension of the existing waste water treatment plant          | 30        | tCOD/d              |
|   |  |           |                     |
| Konya Seker San. Ve Tic. A.S.                       | Beet soil separation/ Anaerobic –aerobic waste water           | 700       | 4TCC/s <sup>1</sup> |
| Konya, Turkey                                       | treatment in the sugar industry                                | 700       | tTSS/d              |
|   | Dewatering beet soil with                                      | 100<br>30 | m³/h<br>tCOD/d      |
|   | 3 Decanter<br>Anaerobic stage                                  | 800       | kgN/d               |
|   | aerobic stage with nitrification/denitrification               | 000       | ngiv/u              |
| Povozsky cukor o o                                  | Anaerobic-aerobic waste water treatment                        | 29        | tCOD/d              |
| Povazsky cukor, a.s.<br>Trencianska Tepla, Slovakia | (Reconstruction)   | 550       | kgN/d               |
| Member of Nordzucker Group                          | ANALIFT  | 550       | kgiv/u              |
| member of Nordzacker Ordap                          | aerobic treatment with nitrification/denitrification           |           |                     |
|   | acrosic treatment with mitimodilon/demitimodilon               |           |                     |

1E630 Food Ind Rev 11 Page: 4 Of: 8 Date: 09/11/2016

| Client  | Plant Type   | Сара        | acity          |
|---|--|-------------|----------------|
| De Smet S.A. / Orafti S.A.<br>San Pedro, Chile          | Sedimentation of muddy waters / anaerobic waste water treatment ANALIFT  | 156<br>380  | m³/h<br>tCOD/d |
| Konya Seker Fabrikasi<br>Cumra, Turkey                  | Anaerobic-aerobic waste water treatment ANALIFT aerobic treatment with nitrification/denitrification                           | 150<br>380  | m³/h<br>m³/h   |
| Südzucker Bioethanol GmbH<br>Zeitz, Germany             | Anaerobic-aerobic waste water treatment<br>ANAFLUX / METEOR / GDE  | 235<br>11.1 | m³/h<br>tCOD/d |
| Südzucker AG<br>Wabern, Germany                         | Aerobic wastewater treatment: Nitrification, denitrification   | 145<br>420  | m³/h<br>kg N/d |
| Zuckerfabrik Jülich<br>Germany                          | Boiler feed water treatment: Demineralisation, CO <sub>2</sub> removal, mixed bed exchanger Neutralisation and chemical storag | 2 x 25      | m³/h           |
| Zuckerfabrik Jülich AG<br>Jülich , Germany              | Aerobic wastewater treatment: Extension of an already existing treatment plant by nitrification/denitrification                | 1,100       | kg N/d         |
| VUC Praha A.S.<br>Sugra Factory,<br>Brottewitz, Germany | Aerobic wastewater treatment   | 180         | kg N/d         |
| Nordzucker AG<br>Uelzen, Germany                        | Anaerobic wastewater treatment ANALIFT   | 40          | t COD/d        |
| Südzucker AG<br>Zeitz, Germany                          | Anaerobic wastewater treatment ANALIFT   | 21          | t COD/d        |
| Pfeifer u. Langen AG<br>Elsdorf, Germany                | Anaerobic wastewater treatment ANALIFT   | 3           | t COD/d        |
|   | Aerobic wastewater treatment: Nitrification, denitrification   | 700         | kg N/d         |
| Südzucker AG<br>Groß-Gerau, Germany                     | Anaerobic wastewater treatment ANALIFT   | 35          | t COD/d        |
|   | Aerobic wastewater treatment: Nitrification, denitrification   | 720         | kg N/d         |
| AGRANA Zuckerfabrik Tulln<br>A-Tulln                    | Anaerobic wastewater treatment ANALIFT   | 29          | t COD/d        |
| AGRANA Zuckerfabrik Tulln<br>Tulln, Austria             | Aerobic wastewater treatment: Nitrification, denitrification   | 340         | Kg N/d         |
| Zuckerfabrik Tulln<br>Tulln, Austria                    | Anaerobic wastewater treatment ANALIFT   | 29          | t COD/d        |
|   | Aerobic wastewater treatment: Nitrification, denitrification   | 340         | kg N/d         |
| Nordzucker AG<br>Schladen, Germany                      | Anaerobic wastewater treatment ANALIFT   | 28          | t COD/d        |
|   | Aerobic wastewater treatment: Nitrification, denitrification   | 630         | kg N/d         |

1E630 Food Ind Rev 11 Page: 5 Of: 8 Date: 09/11/2016

| Client                                    | Plant Type   | Сар | acity   |
|---|--|-----|---------|
| Pfeifer u. Langen<br>Lage, Germany        | Anaerobic wastewater treatment<br>ANALIFT                    | 35  | t COD/d |
|   | Aerobic wastewater treatment: Nitrification, denitrification | 860 | kg N/d  |
| Zuckerfabrik Jülich AG<br>Jülich, Germany | Anaerobic wastewater treatment ANALIFT                       | 29  | t COD/d |
|   | Aerobic wastewater treatment: Nitrification, denitrification | 580 | kg N/d  |
| Südzucker AG<br>Platting, Germany         | Anaerobic wastewater treatment ANALIFT                       | 35  | t COD/d |
| Südzucker AG<br>Offstein, Germany         | Anaerobic wastewater treatment ANALIFT                       | 23  | t COD/d |

#### **Brewing & Drinks Industry**

| Trebjesa Brauerei (InBev),<br>Niksic , Montenegro     | Neutralisation of brewery waste water with NaOH and CO <sub>2</sub>   | 3,000            | m³/d |
|---|---|------------------|------|
| Epe<br>Gronau, Germany                                | Treatment for fruit juice dilution:<br>Dosage Novalis 8520  | 15               | m³/h |
| Löwenbräu<br>Munich, Germany                          | Treatment of slurry deposit station: Slurry deposit station   | 1,500            | l/h  |
| Heineken Italia<br>former Dreher)<br>Aosta, Italy     | Extended aeration, clarification, sludge flotation, sludge centrifugation   | 1,550            | m³/d |
| Brauerei VELTINS<br>Meschede, Germany                 | Direct discharge into the receiving water:<br>Extension of an already existing treatment system (mixing<br>and equalisation basin, trickling filter, aeration and final<br>clarification) by a biofilter for final treatment (dry filter<br>system) | 2,000            | m³/d |
| AGUILA Heineken<br>Madrid, Spain                      | Direct discharge into the receiving water: Screen, lift station  1st treatment stage anaerobic:   | summer<br>10,000 | m³/d |
|   | <ul> <li>preliminary acid fermentation</li> <li>neutralisation</li> <li>fermentation (Flowbed reactor)</li> <li>2<sup>nd</sup> treatment stage aerobic:</li> <li>aeration</li> <li>final clarification</li> <li>sludge centrifugation</li> </ul>    | winter<br>4,000  | m³/d |
| KRONENBOURG<br>Obernai, France                        | Neutralisation, nutrient addition, trickling filter with downstream intermediate clarification, weakly loaded aeration, sludge dewatering via chamber filter press  | 15,000           | m³/d |
| Brauerei MUTZIG<br>Stadt Molsheim<br>Molsheim, France | Pre-clarification, weakly loaded aeration, anaerobic sludge digestion, sludge dewatering via chamber filter press   | 6,000            | m³/d |
| SEBASTIAN ARTOIS<br>Armentières, France               | Rotating sieve, buffering basin, acid fermentation reactor, neutralisation, anaerobic reactor system UASB   | 2,600            | m³/d |

1E630 Food Ind Rev 11 Page: 6 Of: 8 Date: 09/11/2016

# Yeast industry





| MIX Spoltka Akcyjna<br>Warsaw, Poland | Aerobic-aerobic waste water treatment in the yeast industry Moving bed reactor Deamonification DEMON® FLOCOPAC   | 50<br>50          | m³h<br>kg KN /d            |
|---------------------------------------|--|-------------------|----------------------------|
| Lesaffre<br>Wolczyn, Poland           | Aerobic waste water treatment in the yeast industry Nitrification / denitrification  | 108<br>630<br>6.3 | m³h<br>kg KN /d<br>t COD/d |
| Alltech Fermin<br>Senta, Serbia       | Anaerobic-aerobic waste water treatment in the yeast industry Anaerobic WWTP with Deammonification aerobic post-treatment phosphorus removal Nitrification/denitrification | 104<br>2<br>40    | m³h<br>kg KN /d<br>t COD/d |
| Leiber<br>Bramsche, Germany           | Anaerobic waste water treatment High-performance staget UASB ANAFIT-AC   | 7                 | t COD/d                    |
| Rompak<br>Pascani, Romania            | Aerobic waste water treatment for yeast waste wateraerobic treatment with nitrification/denitrification  | 167<br>696        | m³h<br>kg KN /d            |

## Waste Water Treatment in other industries

| Südstärke<br>Schrobenhausen, Germany            | Boiler feed water treatment for starch producer:<br>Reverse osmosis Novalis 3865<br>Softener DKSQ600                           | 6.8 | m³h    |
|---|--|-----|--------|
| Aviko Deutschland GmbH<br>Rain a. Lech, Germany | Treatment of wastewater resulting from potato processing: BIO-P (biological phosphate removal), nitrification, denitrification | 800 | kg N/d |
| Jupiter-Friskies<br>Bük, Hungary                | Waste water treatment for production from petfood Sieving machine, flotation   | 25  | m³h    |
| Amino GmbH<br>Frellstedt                        | Aerobic wastewater treatment (extension) Nitrification, denitrification  | 780 | kg N/d |

1E630 Food Ind Rev 11 Page: 7 Of: 8 Date: 09/11/2016

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