



# **Certificate of Accreditation**

## **Sewage Management Facility**

### **Aerated Wastewater Treatment System**

### **Advanced Secondary Effluent**

*This Certificate of Accreditation is issued by the Secretary of the NSW Ministry of Health pursuant to Clause 41(1) of the Local Government (General) Regulation 2005.*

*System: "Kingspan BioFicient Advanced" Secondary AWTS*

*Manufacturer: Kingspan Water & Energy Pty Ltd*

*Address: 3 Herbert Place, Smithfield, NSW, 2164*

*The "Kingspan BioFicient Advanced" STS-AWTS as described in Schedule A, has been Accredited as a sewage management facility in accordance with the Secondary Treatment System Accreditation Guideline 2018 for use in single domestic premises in NSW. This Accreditation is subject to the conditions and permitted uses specified in Schedule B.*

*A/Director, Environmental Health  
for Secretary (delegation PH335)*

**Issued:** 6 July 2020

**Certificate No:** STS-AWTS046

**Expires:** 31 December 2025



**Schedule A: Specification / Description of the Kingspan BioFicient Advanced STS**

**Name & Model** - Kingspan BioFicient Advanced

**Treatment Capacity** - The Kingspan BioFicient Advanced is designed to treat sewage from a residential dwelling, occupied by a maximum of 8 persons.

**STS Vessel** - The Kingspan BioFicient Advanced is contained in a single GRP (Glass Reinforced Plastic) Tank. Design capacities are shown below.

<b>Chamber</b>	<b>Design Capacities</b>
<b>Primary Treatment</b> <i>*working volume is 2869 Litres with 615 Litres available for floating scum</i>	3484 Litres
<b>Partition</b>	Yes
<b>Secondary Treatment</b> <i>Aeration Chamber</i> <i>Clarifier</i> <i>Irrigation Chamber</i>	1097 Litres 545 Litres 1403 Litres
<i>Emergency Storage</i> <i>Primary Operational Water Level (depth)</i> <i>Secondary Operational Water Level (depth)</i>	1403 Litres 1500 mm 1500 mm

**Emergency Storage** The Emergency Storage Capacity is achieved in the final chamber of the BioFicient Advanced. A volume of 1403 litres is available above the normal working level of the final effluent pump in the Chlorination/ Effluent Pumping chamber.

**Kingspan BioFicient Advanced:** The Kingspan BioFicient Advanced Aerated Wastewater Treatment Plant is a single piece tank which has the following chambers / components:

- **Primary Treatment Chamber:** Sewage from the domestic dwelling will flow to the two-part Primary Settlement Chamber of the STS, where a physical separation of foreign material and sewage solids will occur. The Primary Settlement Chamber is split in to two chambers (2/3 x 1/3). This initial separation/treatment chamber will reduce the Biochemical Oxygen Demand and Total Suspend Solids concentration within the incoming wastewater, before passing this Primary Treated Effluent, by displacement, into the following Biological Treatment Chamber of the STS.
- **Air Supply:** Situated in the supplied external blower housing, a Secoh JDK-S 80 or similar specification Air Compressor is used to provide a nominal airflow of 80 ltrs/min to the Disc Diffuser, located at the bottom of the Biological Aeration Chamber.
- **Biological Aeration Chamber:** The Biological Aeration Chamber (Biozone) is the main treatment chamber of the BioFicient Advanced. The treatment process employed would be described as a Moving Bed Bioreactor (MBBR). Loose, patented high surface area media is contained in the Biozone and allows the healthy growth of the required micro-organisms (biomass) on this surface area. The naturally occurring biomass requires a source of organic "food" and oxygen to live. The organic "food" source is supplied in the incoming sewage liquor. The biomass will biologically process the organic matter in the liquor solution. Air (Oxygen) is driven in to the MBBR from the fixed fine bubble disc diffuser in the bottom of the chamber. The air serves two main purposes in the BioFicient Advanced - The air flow provides the required oxygen for the biomass and drives the moving bed of biomass holding media. The constant movement of air in the Biozone re-circulates the sewage liquor and moving media, thus ensuring maximum contact and biological reaction.
- **Clarifier:** The Biologically treated wastewater flows in to the Clarification Chamber of the STS. This Chamber will allow fine solids, within the final effluent, to settle out. Once settled, the fine solids will be periodically removed from the Chamber and transferred back to the Primary Treatment Chamber. The transfer is executed using a Grundfos Unilift KP250 Stainless Steel Submersible Pump on a timer control. The timer is factory set but can be adjusted, if necessary, by the Service provider.
- **Fine Filtration:** On exit of the Clarification Chamber, the treated effluent will pass through a Polylok Fine Filter, thus removing any fine solids still present, in suspension, in the pre-disinfected effluent.
- **Chlorine Disinfection:** Following fine filtration, the effluent will pass through a none mechanical Chlorine Tablet Feeder. Effluent passes over the Chlorine tablet, causing it to dissolve and release the active



chemical into the effluent flow. The greater the flow, the more the tablet will dissolve. This process then allows the required disinfection of the treated effluent, within the final outlet chamber. The Feeder is designed to use industry standard Chlorine Tablets, designed for use in a Wastewater Treatment Plant and will be easily replenished during the quarterly service visit.

- **Final Chamber:** The Final Effluent Chamber contains a Grundfos Unilift KP250 Stainless Steel Submersible Pump to facilitate delivery of the final treated effluent to the drainage irrigation system. The KP250 can be substituted with similar pumps from the Grundfos range, when greater pump heads are required. The Grundfos pump will operate as required using a level float switch to start and stop.
- **Access Covers:** The BioFicient Advanced has 3 separate access covers to the different stages of the treatment process. These access covers are pedestrian duty and lockable. The access openings are large and will easily facilitate access for routine maintenance and periodic sludge removal.
- **Control Panel:** All of the mechanical functions of the STS are controlled from an external Electronic Control Panel. The IP65 Panel is contained within the external blower housing. The panel will receive the protected incoming power source from the property and will then distribute power to the Air Compressor, the Sludge Return Pump and the Discharge Pump. The Panel will also power the system alarm function and operate the alarm beacon/buzzer.

### Schedule B: Conditions of Accreditation

#### 1. General

- 1.1 Prior to installation the owner/occupier of the premises shall make an application, in accordance with Clause 26 of the *Local Government (General) Regulation 2005*, to the local authority for approval to install and operate the Kingspan BioFicient Advanced as a Sewage Management Facility in accordance with Section 68, Part C of the *Local Government Act 1993*.
- 1.2 The local authority shall apply those Conditions of Accreditation, appropriate to the owner / occupier, to any approval to operate the Kingspan BioFicient Advanced issued under Clause 45(4), *Local Government (General) Regulation 2005*.
- 1.3 In accordance with Clause 36 of the *Local Government (General) Regulation 2005*, the Kingspan BioFicient Advanced shall have an expected service life of 5 years in the case of mechanical and electrical components and 15 years in the case of other components.
- 1.4 The owner / occupier shall ensure that the Kingspan BioFicient Advanced is installed or constructed:
  - in accordance with the accredited specifications of the type tested unit and in accordance with good trade practice, and
  - to allow ease of access for maintenance, and
  - regarding the health and safety of users, operators and persons maintaining the facility, and
  - must be installed or constructed to make appropriate provision for access to and removal of contents in a safe and sanitary manner, and
  - must, if it is intended to be a permanent fixture, be anchored to prevent movement.
- 1.5 The manufacturer / supplier shall ensure that the Kingspan BioFicient Advanced is supplied, constructed and installed in accordance with the design (including the disinfection unit) as submitted and accredited by the NSW Ministry of Health. The Kingspan BioFicient Advanced shall not be modified or altered except that alternate individual mechanical and electrical components such as pumps, PLCs, etc., may be substituted provided that the component meets the Accredited design specification.
- 1.6 Any permanent modification or variations to the accredited design of the Kingspan BioFicient Advanced shall be submitted for separate consideration and variation of the Certificate of Accreditation by the NSW Ministry of Health. Modifications will be considered in accordance with section 2.3.13 of AS1546.3:2017.
- 1.7 Each Kingspan BioFicient Advanced shall be permanently and legibly marked by the manufacturer in accordance with section 3 of AS1546.3:2017.

1.8 The manufacturer shall supply with each Kingspan BioFicient Advanced an owner's manual, which sets out the care, operation, maintenance and on-going management requirements of the system. The owner's manual prepared by the manufacturer shall specifically contain a plan for the on-going management of the Kingspan BioFicient Advanced. The plan shall include details of:

- the treatment process,
- procedures to be followed in the event of a system failure,
- emergency contact numbers,
- maintenance requirements,
- inspection and sampling procedures to be followed as part of any on-going monitoring program developed by the local authority.

1.9 The manufacturer shall provide the following information to each local authority where it is intended to install a Kingspan BioFicient Advanced in their area once accreditation has been obtained:

- |                                   |                                      |
|-----------------------------------|--------------------------------------|
| • Statement of warranty           | • Manufacturer's Service Report Form |
| • Statement of service life       | • Engineering Drawings               |
| • Quality Assurance Certification | • Specifications                     |
| • Installation Manual             | • A4 Plans                           |
| • Service Manual                  | • Certificate of Accreditation       |
| • Owner's Manual                  | documentation from NSW Health.       |

The manufacturer need not provide the above information to the local authority where the information or document is contained on the manufacturer's web site.

## **2. Installation and Commissioning**

2.1 The owner / occupier shall have the Kingspan BioFicient Advanced inspected and checked by the manufacturer or the manufacturer's agent. The manufacturer or the agent is to certify that the system has been installed and commissioned in accordance with its design, conditions of accreditation and any additional requirements of the local authority.

2.2 The owner / occupier shall ensure that all electrical work is carried out on the Kingspan BioFicient Advanced by a licensed electrician and in accordance with the relevant provisions of AS/NZS 3000.

2.3 The owner / occupier shall not commission the Kingspan BioFicient Advanced unless the land application system has been completed.

## **3. Maintenance**

3.1 The owner / occupier of the premises shall enter into a minimum 12-month contract or agreement with a service agent and ensure that the Kingspan BioFicient Advanced is serviced:

- in accordance with the manufacturer's / supplier's service manual and using the manufacturer's / supplier's service sheet; and
- by a service agent who
  - has completed a course on the servicing and maintenance of STS; and has some supervised servicing experience or extensive un-supervised experience;
  - is employed or authorised by the manufacturer / supplier of the Kingspan BioFicient Advanced;
  - uses replacement parts which meet the minimum specification of the Kingspan BioFicient Advanced;
  - has advised of their name, contact details and credentials to the local authority;
  - submits a completed NSW Health "Local Council Service Report" (attached) to the local authority immediately after every service;
  - shall report to the local authority any instances where the owner / occupier refuses to authorise repairs, replacement of parts or maintenance; and
  - does not perform electrical work or enter confined spaces unless trained and is suitably qualified to do so.

3.2 The owner/occupier shall not service the Kingspan BioFicient Advanced unless they are an authorised agent.

3.3 The Kingspan BioFicient Advanced once installed and commissioned shall be serviced at 3 monthly intervals.



- 3.4 The manufacturer / supplier of the Kingspan BioFicient Advanced shall place on its web site a copy of the service manual, service sheet or form and specifications for the Kingspan BioFicient Advanced to facilitate servicing, maintenance and repairs. Commercial-in-confidence documents may be provided directly to the service agent without uploading to the web site.
- 3.5 Each three monthly service shall, as a minimum where provided, include a check on all mechanical, electrical and functioning parts of the system including:
- The chlorinator and replenishment of the disinfectant,
  - Any alternative disinfection unit,
  - Replace a UV light globe at recommended intervals and keep a record,
  - Pump and air blower,
  - The alarm system,
  - Slime growth on the filter media,
  - Operation of the sludge return system,
  - The effluent irrigation area,
  - On-site testing for free residual chlorine, pH and dissolved oxygen at the appropriate check points.

#### 4. Verification

- 4.1 Effluent from the Kingspan BioFicient Advanced taken in any random grab sample shall comply with the following standard:
- BOD<sup>5</sup> less than 30 mg/L
  - TSS less than 45 mg/L
  - E. coli less than 100 cfu/100 ml
  - Free residual chlorine greater than 0.2 and less than 2.0 mg/L

#### 5. Permitted uses

- 5.1 The effluent is suitable for re-use for garden purposes by way of any of the forms of irrigation as described in AS/NZS 1547:2012:
- above ground spray irrigation; and/or
  - surface drip irrigation covered by mulch; and/or
  - sub-surface drip irrigation installed at around 100 mm depth; and or
  - any form of sub-soil application.
- Each of the forms of irrigation or application is subject to the approval of the local authority.

#### 6. Advanced Secondary Treatment System

- 6.1 The Kingspan BioFicient Advanced when tested by a Product Certification Body in accordance with AS1546.3:2017 was found to comply with the Advanced Secondary Effluent Criteria as follows:

**TABLE 2.1 (Abrev) AS1546.3:2017  
ADVANCED SECONDARY EFFLUENT COMPLIANCE CRITERIA FOR A STS**

Parameter	Advanced secondary effluent	
	90% of Samples	Maximum
BOD5	≤ 10mg/L	20 mg/L
TSS	≤ 10 mg/L	20 mg/L
<i>E. coli</i> *	≤ 10 cfu/100mL	30 cfu/100mL
FAC p	Minimum 0.5 mg/L†	N/A
Turbidity ?	N/A	10 NTU

\* Where disinfection is required.

p Where chlorine disinfection is used.

† Minimum level, not 90% of samples.

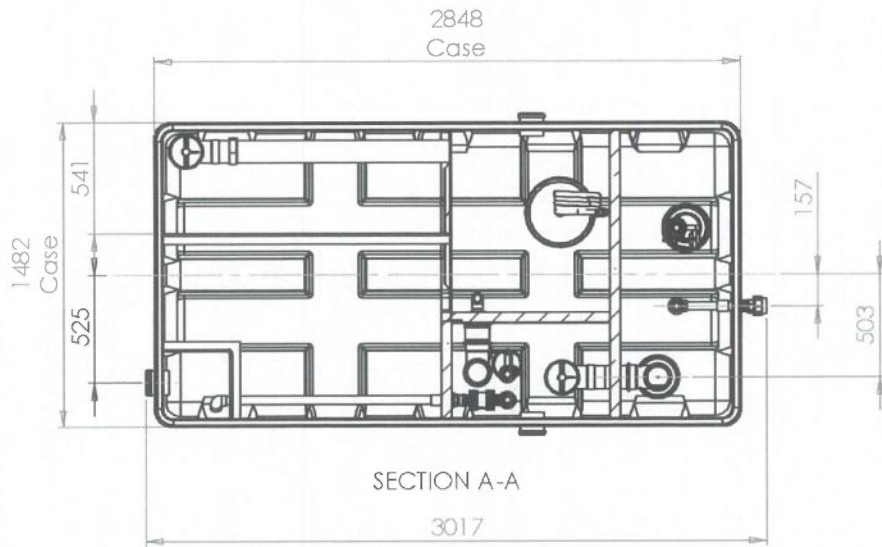
? Where UV light is used for disinfection.

Local Council STS (DGTS) Service Report: February 2018		
Owner's Name:	Local Council:	
Installation Address:		
System Brand & Model:	<input type="checkbox"/> Domestic	<input type="checkbox"/> Commercial
Date of this service: / /	Date of last Service: / /	Next service due: / /
Has the STS/DGTS been <b>serviced</b> in accordance with the manufacturer's / supplier's requirements and using the service sheet? <input type="checkbox"/> Yes <input type="checkbox"/> No If "No" why not?		
STS/DGTS <b>functioning</b> correctly? <input type="checkbox"/> Yes <input type="checkbox"/> No If "No" why not?		
According to sludge-judge or other methodology is de-sludging needed? <input type="checkbox"/> Yes <input type="checkbox"/> No If "Yes" what action is recommended?		
Offensive odours?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If "Yes" what action is recommended?
Alarms tested and functional?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If not "functional" what action is recommended?
<b>Final Effluent Quality</b>		
Tested?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Disinfected?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Chlorine tablets remaining?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Quality?	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory	
On what evidence is this judgement made? If "Unsatisfactory" what action was recommended?		
<b>Land Application Area</b>		
Surface ponding?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Run off?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Excess plant growth?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Effluent leaving premises?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
High risk areas contaminated?*	<input type="checkbox"/> Yes <input type="checkbox"/> No	* Patio, play areas, BBQ, etc
Operating satisfactorily?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If "Not operating satisfactorily" what action was recommended?
<b>Overall Condition of STS?</b> <input type="checkbox"/> Excellent <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor		
Comments / Action Recommended / Repairs Needed / Repairs Performed:		
Has the owner / occupier taken recommended actions? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Service Agent:	Contact Details:	
Signature:	Date:	

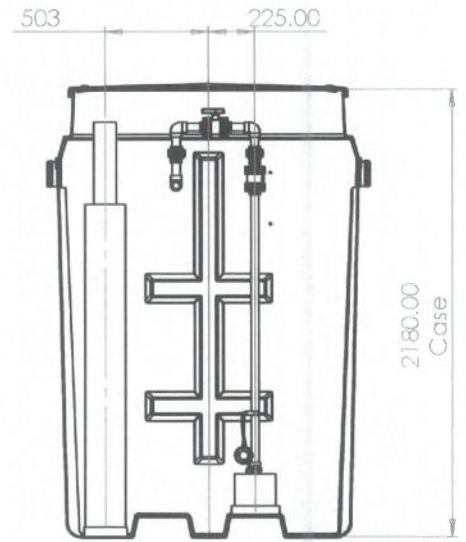
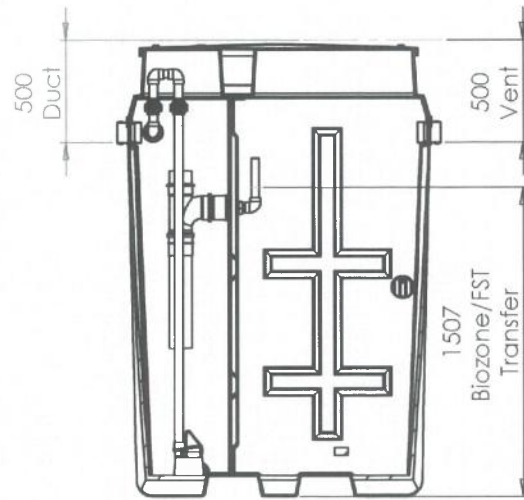
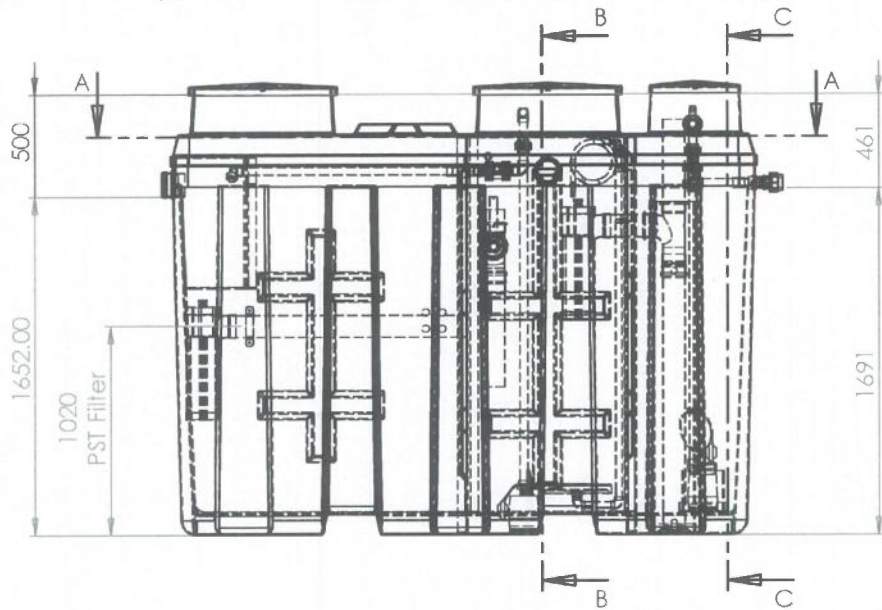
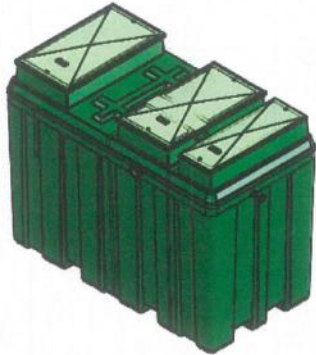
Source: Adapted from "Checklist 4.2: Operational AWTs inspection report for use by service providers and Council inspectors" in *Designing and Installing On-Site Wastewater Systems*, Sydney Catchment Authority, May 2012







**ACCREDITED**  
 - 6 JUL 2020  
 NSW MINISTRY OF HEALTH



SECTION B-B

SECTION C-C

Material : Various  
 Finish :  
 Weight :

Tolerance :  
 Thickness : n/a  
 Surface Area :

**Drawing : 404440**  
 BioFicient Advanced - Dimensional Drawing

All dimensions in mm

Scale: Not to scale

Kingspan Water & Energy reserve the right to alter the details of this drawing without prior notice. This drawing is copyright and may not be reproduced or used without the written permission of Kingspan Water & Energy.



