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CASE STUDY

# Anaerobic Digester Plant

## Norfolk, UK

**Anaerobic Digester Plants utilize organic waste by fermenting it to produce natural gas. This gas is then used to make 'clean energy' which can supplement the national network. These facilities are becoming more common as the focus on renewable energy becomes evermore important.**

Project owner
**Mike Boggust**

Product
**DURUS S400**
**Fibrin XT**

Function
**Polypropylene Fibres used to replace conventional steel fabric whilst maintaining post failure serviceability**

Contractor
**J H Vaudrey**

Volume
**2000kg DURUS S400**
**500kg Fibrin XT**

### Challenge

Bonar were approched by the Consulting Structural Engineer to provide a synthetic macro fibre solution for the ground bearing external reinforced concrete slab. The nature of the Process involves the storage and fermentation of acidic organic waste (from maize production) which would corrode conventional steel fabric reinforcement leading to a shortened service life and also pose a risk of contamination of the ground beneath the facility in the event of a containment failure. The Environment Agency took a keen interest in this during planning approval.

### Solution

- Design loadings were provided, with the designated concrete grade and pavement thickness to allow one of Bonar's Consulting Engineers to calculate a sufficient dosage of DURUS S400 and supply a professionally indemnified solution.
- Fibrin XT was also incorporated into the solution to give improved plastic shrinkage cracking resistance, enhance durability and frost protection.

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Large areas can be poured straight from the truck without the need for pumping.

Macro fibre reinforced concrete eliminates the use of steel and the risk of shortened service life due to corrosion and spalling.

## Benefits of the solution

- High risk of accellerated failure and spalling due to corrosion of steel reinforcement over time has been eliminated.
- Design loading requirements have been maintained by the use of DURUS S400 macro Fibres.
- The use of Fibrin XT has resulted in enhanced durability and frost protection.
- Embedded carbon has been reduced, promoting sustainability.
- Health & Safety hazards associated with steel fixing, handling & placement have been eliminated.

## Installation benefits

Construction time has been reduced as no steel fixing was required.
Concrete could be poured directly into formwork, without the need for pumping due to in-situ steel fabric.
Larger areas of pavement can be poured, contraction joints made after initial set (12-24 Hours).

## Result

Structural requirements for traffic and loadings have been maintained whilst eliminating the risk of accellerated failure due to steel reinforcement corroding after prolonged contact with the acidic waste liquid, or a containment failure.

Construction time and Health & Safety Hazards have been reduced. Sustainability has been improved due to the reduction in embedded carbon from using synthetic macro fibres in place of traditional steel mesh.

## Products used

**DURUS S400**
Synthetic Macro Fibre used to replace structural steel mesh reinforcement

**Fibrin XT**
Monofilament micro fibre for protection against plastic shrinkage cracking whilst improving durability and frost resistance

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