



ENDOLYS LTD

BRIEFING NOTE – ATT TECHNIQUES

Darlington Chemical Recycling Facility – Pyrolysis

1) Please briefly describe the technology adopted by the system, specifying:

- A. Series of main operations present in the system (eg, thermal unit, syngas clean up)

Please refer to SOL_25_P050_PYR_Application Support Document I1.

- B. Identify the following key point in the system:

- I. Where the syngas generated is expected to achieve End of Waste status

N/A – it is not currently part of the proposals to require EoW status on the syngas. All combustion units utilising syngas as a fuel will be in accordance with Chapter IV of the IED and relevant Waste Incineration BREF BAT-AELs.

- II. Where the syngas leaves the thermal unit prior to entering the gas cleaning system or disposal.

The gas leaves the pyrolysis units and enters the oil production line, the NGC scrubber and then is either directed to the steam generation boiler, recirculated as fuel into the pyrolysis process or enters the flue gas abatement system prior to discharge.

2) Does the process use:

- A. An amount of oxidant equal to or above the stoichiometric requirements (incineration)
- B. An amount of Oxidant below the stoichiometric requirements (Gasification)
- C. No oxidant agent is used in the thermal unit (Pyrolysis)

3) Please specify plant capacity in terms of fuel feedstock mass flowrate (on annual and hourly basis):

- A. Yearly capacity: 120,000 (t/p.a)
- B. Hourly capacity: 15.6 (each pyrolysis unit has a capacity of 1.3tph) (t/hr)

4) Please specify what type of primary, secondary, or tertiary waste / fuel the plant will or might adopt in the foreseeable future:

Primary Fuel

- A. Mix/ Max Flowrate (kg/hr)
- B. Mix/ Max Gross Heating Value of the feedstock (MJ/kg)

Please refer to SOL_25_P050_PYR_Application Support Document I1.



Secondary Fuel

- A. Mix/ Max Flowrate (kg/hr)
- B. Mix/ Max Gross Heating Value of the feedstock (MJ/kg)

Tertiary Fuel

- A. Mix/ Max Flowrate (kg/hr)
- B. Mix/ Max Gross Heating Value of the feedstock (MJ/kg)

5) Please specify the minimum and maximum mass flowrate of the following elements in the feedstock:

- A. Sulphur (wt% or ppm,wt)

<0.4 weight % (dry)

- B. Chlorine (wt% or ppm,wt)

<1.0 weight % (dry)

- C. Bromine (wt% or ppm,wt)

<1.0 weight % (dry)

- D. Fluorine (wt% or ppm,wt)

<1.01 weight % (dry)

6) Please provide the primary use for the syngas on site.

- A. Controlled combustion
- B. On-site Combustion for power generation
- C. Converted into chemicals, fuel, or fertilisers
- D. Other (please specify)

7) Please provide the secondary and tertiary use or potential use of the syngas on site: (Secondary and tertiary uses are defined as potential uses for the gas that the plant might implement in subsequent expansion projects).

Secondary use.

- A. Direct combustion
- B. On-site Combustion for power generation
- C. Converted into chemicals, fuel, or fertilisers
- D. Other (please specify)

Tertiary Use

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- A. Direct combustion
- B. On-site Combustion for power generation
- C. Converted into chemicals, fuel, or fertilisers
- D. Other (please specify)



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8) Please provide the following properties for the raw syngas¹, considering the worst-case scenario:

- A. Min/ Max CO₂ Content (wt%)
- B. Min/ Max CO Content (wt%)
- C. Min/ Max H₂ Content (wt%)
- D. Min/ Max CH₄ Content (wt%)
- E. Min/ Max H₂S Content (wt%)
- F. Min/Max HCl Content (wt%)
- G. Min/Max HBr Content (wt%)
- H. Min/Max HF Content (wt%)
- I. Min/Max Tars Content² (wt%)
- J. Mix/Max dust and ashes content (g/Nm³) preferably divided according expected granulometry ranges.
- K. Gas density (kg/m³)

Properties of syngas have been provided by Niutech reference plant (Annex B Technical Details). Properties of syngas from Endolys plant will be confirmed upon commissioning.

9) Please provide a high-level mass balance of the plant considering, as minimum:

- A. The feedstock(s)
- B. Other mass flows introduced into the process (i.e. chemicals, adsorbents)
- C. Every output of the plant (Gaseous, Liquid or Solid)

Please refer to Annex B – Technical Information.

10) Please provide a block flow diagram describing the sequence of operations in the process, including any syngas cleaning steps. In addition, provide the expected efficiency removal (percentage by mass) for each contaminant and for each operational unit.

A block flow diagram is provided within the main application document and Annex B – Technical Information.

11) Please provide a description of the critical process parameters of the gas cleaning system units, which are part of the control system of the process. (i.e. Pressure drop monitoring on filtering system).

Please refer to SOL_25_P050_PYR_Application Support Document I1.

12) Please provide the following information:

- A. If the syngas is combusted internally, please provide the expected composition before the combustion point;

¹ Raw syngas is defined as the syngas leaving the thermal unit, prior entering the gas cleaning system. The thermal unit can include one or two stages of gasification, and flash condensation of hydrocarbons if needed.

² Tars are here defined as every organic molecule with a higher molecular weight than Naphthalene (C₁₀H₈), PM = 128,1705 g/mol

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Please refer to Annex B – Technical Information.



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- B. If the syngas is converted into a fuel, chemical or fertiliser product please provide the grade of the product, in accordance with the relevant international quality standards.

Grade 3 Pyrolysis Oil