

XRGI-9 NO_x Emissions Data Sheet

Summary

Heat Related NO _x	Assessment In- put Value
- 325 mg/kWh @ 0% O ₂	0 mg/kWh @ 0% O ₂

Calculation

Total NO_x emissions 100 mg/m³ @ 5% O₂ (manufacturer data)

1. Conversion to mg/kWh factor = 0.857

100 mg/m³ @ 5% O₂ x 0.857 = 86 mg/kWh @ 5% O₂

2. Excess Oxygen Correction Calculation = 20.9 / (20.9 - X)

% O₂ in air = 20.9

X = % Excess O₂ = 5

20.9 / (20.9 - 5) = 1.3144

86 mg/kWh @ 5% O₂ x 1.3144 = 113 mg/kWh @ 0% O₂

NO_x emission calculation; X = (A-B)/C

X = NO_x emission per unit of heat supplied

A = NO_x emission per unit of electricity generated by CHP = Total NO_x x Electrical Generation %

Electrical Generation % = Electrical output / Total output = 9 / (9 + 20) = 0.31

113 mg/kWh @ 0% O₂ x 0.31 = 35 mg/kWh @ 0% O₂

B = NO_x emission per unit of electricity generated by grid (mg/kWh) = 750 mg/kWh (national value)

C = Heat to electricity ratio = 20/9 = 2.2 (manufacturer data)

X = (35 - 750) / 2.2 = - 325 mg/kWh

X = - 325 mg/kWh

As the heat related dry NO_x value calculated here is negative, it can be assumed to be zero for assessments. Please see the calculation notes over leaf for further information.



NO_x Calculation Notes

When discussing NO_x emissions from CHP, it is only the heat related NO_x emissions that need to be considered. Manufacturers typically supply total NO_x values, which need to be allocated to heat and electricity in line with the respective power outputs. The following formula must be used to determine this:

$$X = (A - B)/C$$

Where:

X = NO_x emissions per unit of heat supplied (mg/kWh)

A = NO_x emissions per unit of electricity generated (mg/kWh) Note: This is the NO_x emitted by the CHP system per unit of electricity generated and should be obtained from the supplier. Where data is provided in different units or at a level of excess oxygen above zero it must be corrected using the factors above.

B = NO_x emissions per unit of electricity supplied from the grid (mg/kWh).

Note: this should be assumed to be 750mg/kWh supplied

C = Heat to Electricity Ratio of the CHP scheme

Calculations for The Code for Sustainable Homes and/or BREEAM ratings require dry NO_x values to be used. Dry NO_x is the NO_x emissions (mg/kWh) resulting from the combustion of a fuel at zero per cent excess oxygen levels.

Where the heat related dry NO_x value is calculated to be negative, it should be assumed to be zero for these assessments.