

CD 3045 total gas emmissions calculations

item 1)	HNO3 Used ml/min	HNO3 Used g/hr	NO2 Used g/hr	N2 Used l/min	N2 Used l/hr	NO2 Released g/m^3	NO2 Released g/min	Used for Material
	3.4	310.1	226.4	70.0	4200.0	53.9	3.8	general
	5.1	465.1	339.6	70.0	4200.0	80.9	5.7	BASF
								17-4PH A

Assumptions	Max. Load Capacity	5.8 kg /Shelf 3.5 kg/shelf
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Primary Binder Formula POM (CH2O) _n	Full Load kg	Total Primary Binder kg	Mol.Wt. 1170	CO2 Generated kg/load	Avg. CO2 Generated g/min	H2O Generated kg/load	Avg. H2O Generated g/min	Assumptions
	255.2	25.5		37.4	103.9	15.3	42.5	n=39, 10%POM 6 hr debind time
	154.0	15.4		22.6	94.2	9.2	38.4	4 hr debind time

Afterburner total gas emissions

Afterburner Capacity 78,400 BTU + 3,900 BTU Pilot

1 cu. ft./hr
natural gas
= 1,000
BTU

82.3 cu.ft/hr

= 38.84 l/min

Natural gas
usage

Natural gas is approximately 95% Methane, 2.5% Ethane, += Approx 95% Methane + 5% Ethane

Hydrocarbon	Formula	Mol. Wt.	Gas Used l/min	Gas Generated	
				CO2 g/min	H2O g/min
Methane 95%	CH4	16	36.9	72.5	59.3
Ethane 5%	C2H6	30	1.94	7.6	4.7
Total				80.1	64

Total gas emissions for CD 3045 & Afterburner

	max CO 2 released g/min	max H2O released g/min	max NO 2 released g/min
	80.1	64	
Combined Total	103.9	15.3	5.7
	184	79.3	

MIM 3045 Furnace; BASF Feedstock

H2 max
based on 35
l/min
through hot
zone/35l/mi
n thru retort

H2O Max

Assumptions	Max. Load Capacity	5.8 kg /Shelf 3.5 kg/shelf			70 l/min	56.25 g/min		
	Binder Residue Formula	Full Load kg	Total Binder kg	Binder Exiting g	Mol.Wt.	CO2 Generated g/load	Binder H2O Generated g/load	Assumptions
	Wax							
based on 5.8 kg/shelf	CH3-(CH2)29-CH3	255.2	4.40	132.07	436	828	350	3% binder exits the stack
				5.72 g/m3 without Afterburner		With Afterburner	With Afterburner	
based on 3.5 kg/shelf		154	2.66	79.70		500	211	
				3.45 g/m3 without Afterburner				

Binder exiting in g/m3 is based on typical gas flow of 35 l/min combined for hot zone and retort for 22 hours per run.