

CLAIMS

1. Method for producing ozone in an ozone generating machine (OGM) comprising at least two electrodes (E1, E2) separated by an ozonizing gap (OG) and a dielectric layer, and located in an ozone generator (OzG) comprising at least a gas inlet (O2IN) for receiving a feed gas containing dioxygen, and a gas outlet (O3OUT) for exhausting gas comprising ozone, the method comprising the steps of:
- supplying the feed gas containing dioxygen at the gas inlet (O2IN) of the ozone generator (OzG), at a given feed gas flow and feed gas pressure,
 - 10 - supplying an alternating electric current to said at least two electrodes (E1, E2) of the ozone generator (OzG) so as to create electric discharges in the ozonizing gap (OG), to generate a given amount of ozone at the gas outlet (O3OUT) of the ozone generator (OzG),
 - adjusting electric current power and at least one of a plurality of process parameters comprising feed gas flow, electric current frequency, electric current voltage, cooling temperature of the ozone generator (OzG), to adjust the amount of generated ozone at the gas outlet (O3OUT) of the ozone generator (OzG),
 - 15 characterized in that the method comprises, during ozone production, the steps of:
 - 20 - monitoring electric power and said at least one parameter of the plurality of process parameters comprising feed gas flow, electric current frequency, electric current voltage, cooling temperature,
 - and then, adjusting the feed gas pressure in response to the adjustment of
 - 25 the electric current power and said at least one process parameter.
2. Method according to the preceding claim, wherein the step of adjusting the feed gas pressure comprises:
- a step of calculating a derivative with respect to feed gas pressure of a model predicting a performance of the ozone generator (OzG) based on feed

gas pressure, electric current power and said at least one of the said process parameters, to determine an optimum feed gas pressure leading to an optimized efficiency of the ozone generator (OzG) operated with the adjusted value of electric current power and said at least one adjusted process
5 parameter, and
- adjusting the feed gas pressure to reach the optimum gas feed pressure within the ozone generator (OzG).

3. Method according to any one of the preceding claims, comprising a step of monitoring the generated amount of ozone at the gas
10 outlet (O3OUT) of the ozone generator (OzG) by measuring an ozone concentration and/or measuring a flow of gas flowing through the ozone generator (OzG).

4. Method according to any one of the preceding claims, wherein the steps of calculating the optimum feed gas pressure and adjusting the feed
15 gas pressure are performed simultaneously to, or within a predetermined operating time following a change in electric current power or said at least one parameter of the plurality of process parameters.

5. Method according to any one of the preceding claims, wherein an adjustment of electric current power is an adjustment of electric current
20 frequency.

6. Method according to the preceding claim, wherein:
during the step of adjusting electric current power and at least one of a plurality of process parameters, only the electric current frequency and the feed gas flow are adjusted, and wherein:
25 - an increase of electric current frequency leads to an increase of feed gas pressure,
- a decrease of electric current frequency leads to a decrease of feed gas pressure.

7. Method according to any one of the claims 1 to 4, wherein an
30 adjustment electric power is an adjustment of electric current voltage.

8. Method according to the preceding claim, wherein:

during the step of adjusting electric current power and at least one of a plurality of process parameters, only the electric current voltage and the feed gas flow are adjusted, and wherein:

- 5 - an increase of electric current voltage leads to an increase of feed gas pressure,
- a decrease of electric current voltage leads to a decrease of feed gas pressure.

9. Method according to any one of the preceding claims, wherein

- 10 the absolute gas pressure in the ozone generator (OzG) is varied in a range of [0.5bar(a) – 6bar(a)].

10. Method according to claim 1, comprising the steps of:

- monitoring the generated amount of ozone,
- monitoring the feed gas pressure,
15 - monitoring an amount of electricity consumed,
- calculating and monitoring an ozone yield based on the generated amount of ozone and the amount of electricity consumed,
- comparing the ozone yield before and after the step of adjusting the gas feed pressure, and
20 - re iterating the step of adjusting the feed gas pressure if ozone yield is decreased after the step of adjusting the gas feed pressure, so as to optimize the ozone yield.

11. Method according to the preceding claim, comprising the step of

- further adjusting the feed gas pressure if ozone yield is increased or is the
25 same after the step of adjusting the gas feed pressure, so as to further increase the ozone yield.

12. Method according to claim 10 or 11, comprising the step of

maintaining the feed gas pressure if ozone yield is increased or is the same after the step of adjusting the gas feed pressure.

13. Ozone generating machine (OGM) comprising:
- an ozone generator (OzG) comprising a gas inlet (O2IN) for receiving feed gas containing dioxygen, and a gas outlet (O3OUT) for exhausting gas comprising ozone,
- 5 - at least two electrodes (E1, E2) located in the ozone generator (OzG) and separated by an ozonizing gap (OzG) and a dielectric layer,
- a pressure regulator connected to the ozone generator (OzG),
 - an electric power unit (EPU) connected to the at least two electrodes (E1, E2),
- 10 - a flow regulator (O3R) connected to the ozone generator (OG),
- a control unit adapted to control said pressure regulator, electric power unit, flow regulator, to perform the method of any one of the preceding claims.