CLAIMS

1. A Mmethod 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 givenfirst feed gas flow and first feed gas pressure,

- 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 an electric current power density and at least one ofprocess parameter selected from a plurality of process parameters comprising: (i) feed gas flow, (ii) frequency of the alternating electric current frequency, (iii) voltage of the alternating electric current voltage, or (iv) cooling temperature of the ozone generator (OzG), to adjust the amount of generated ozone at the gas outlet (O3OUT) of the ozone generator (OzG),

characterized in that the method comprises, during ozone production, the steps of:

- monitoring electric power and saidthe 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 first feed gas pressure to a second feed gas pressure in response to the adjustment of the electric current power and said at least one process parameter.

2. The ~~M~~method according to ~~the preceding~~ claim 1, wherein the step of adjusting the first feed gas pressure to the second 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 first feed gas pressure, the electric current power density 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 the electric current power density and said at least one adjusted process parameter, and

~~-~~adjusting the first feed gas pressure to the second feed gas pressure to reach the optimum gas feed pressure within the ozone generator (OzG).

3. The ~~M~~method according to ~~any one of the preceding~~ claim~~s~~ 1, further comprising a step of monitoring the generated amount of ozone at the gas 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. The ~~M~~method according to ~~any one of the preceding~~ claim~~s~~ 2, wherein the steps of calculating the optimum feed gas pressure and adjusting the first feed gas pressure to the second feed gas pressure are performed simultaneously to, or within a predetermined operating time following a change ~~in electric current~~ power of the alternating electric current or ~~said~~the 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 frequency.~~

~~6.~~5. The m~~M~~ethod according to ~~the preceding~~ claim 1, wherein:

during the step of adjusting ~~electric current power and~~the at least one ~~of a plurality of~~ process parameter~~s~~, only the frequency of the alternating electric current ~~frequency~~ and the feed gas flow are adjusted, and wherein:

- an increase of the frequency of the alternating electric current ~~frequency~~ leads to an increase of the first feed gas pressure, and
- a decrease of the electric current frequency of the alternating electric current leads to a decrease of the first feed gas pressure.

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

~~8.~~6. The ~~M~~method according to ~~the preceding~~ claim 1, wherein: during the step of adjusting electric current power density and at least one ~~of a plurality of~~ process parameter~~s~~, only the electric current voltage and the feed gas flow are adjusted, and wherein:

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

~~9.~~7. The m~~M~~ethod according to ~~any one of the preceding~~ claim~~s~~ 1, wherein the ~~absolute~~first feed gas pressure in the ozone generator (OzG) is varied to the second feed gas pressure ~~in~~within a range of ~~[~~0.5bar(a) – 6bar(a)~~]~~.

~~10.~~8. The ~~M~~method according to claim 1, further comprising the steps of:

- monitoring the generated amount of ozone,
- monitoring the feed gas pressure,
- 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 first gas feed pressure to the second gas feed pressure, and
- ~~re iterating the step of~~ adjusting the second feed gas pressure to a third 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.~~9. The ~~M~~method according to ~~the preceding~~ claim 8, further comprising the step of further adjusting the third feed gas pressure if ozone yield is increased or is the same after the step of adjusting the second gas feed pressure to the third feed gas pressure, so as to further increase the ozone yield.

~~12.~~10. The m~~M~~ethod according to claim ~~10 or 11~~8, further comprising the step of maintaining the third feed gas pressure if ozone yield is increased or is the same after the step of adjusting the second gas feed pressure to the third 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,~~

~~- 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),~~

~~- 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.~~