

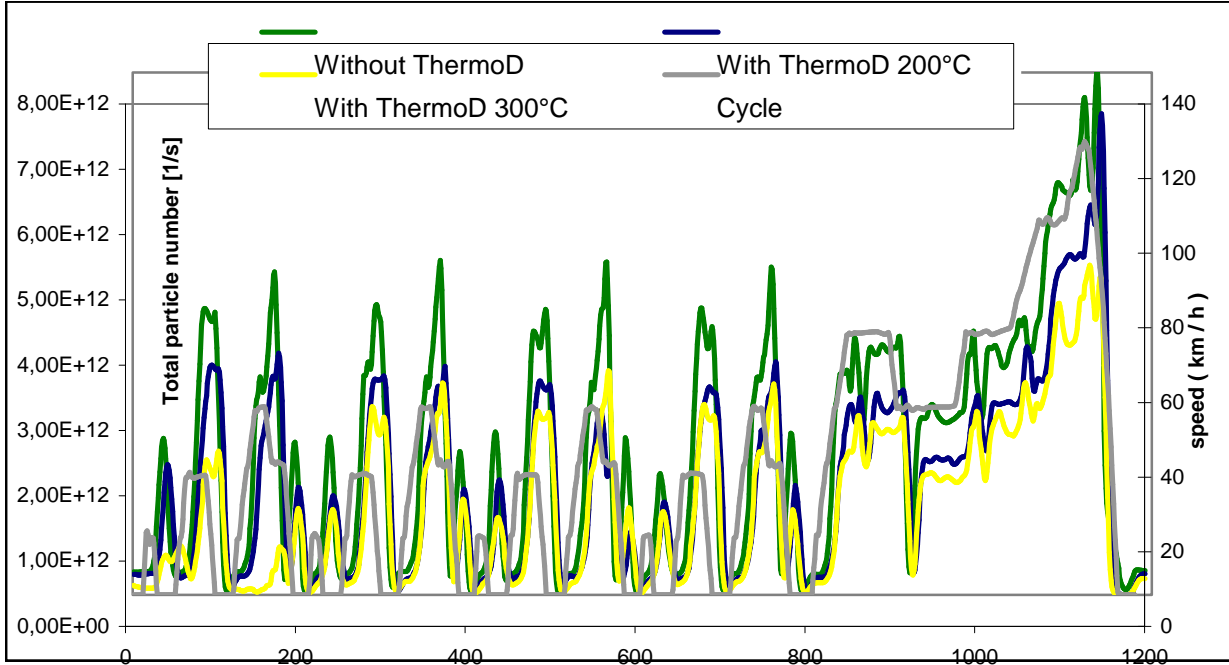
DIESEL CAR (Euro 3) - 1,9 Common Rail Turbo-Charged : Diesel Fuel with 270 ppm S

HOT European Driving Cycle

ELPI sampling from the CVS + secondary dil. (x 10) :

10 nm - 10 microns - 13 channels - 1 Hz greased sintered metal plates

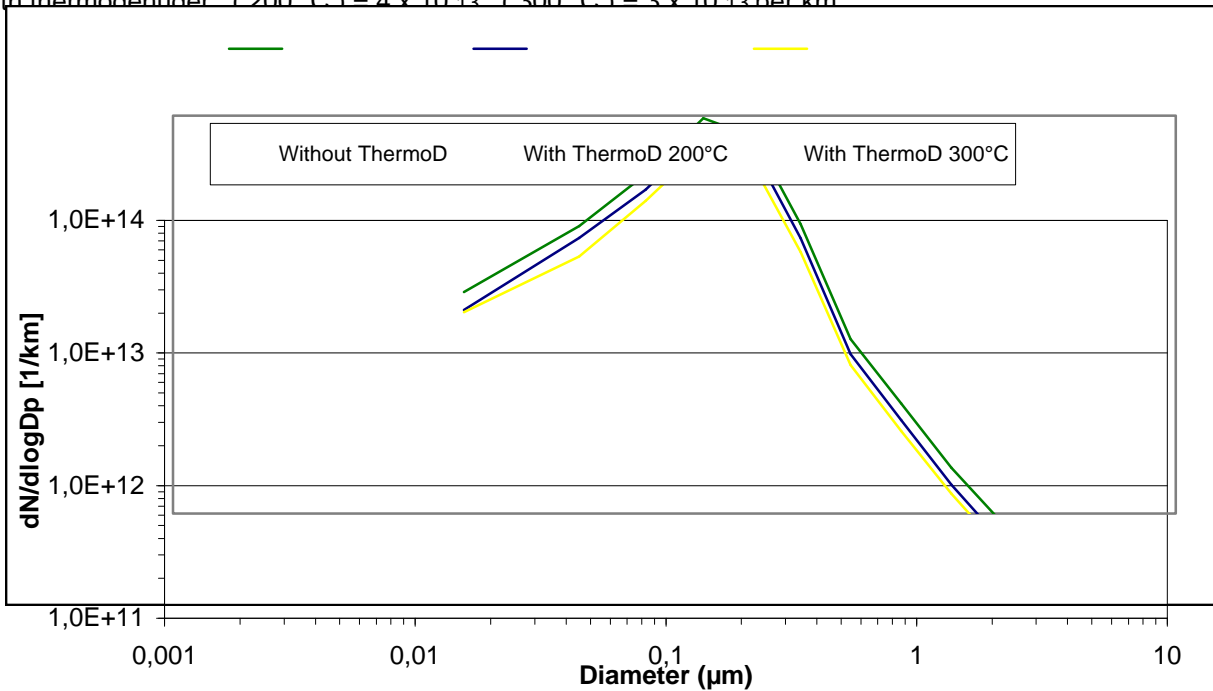
thermodenuder : installed between the dilution stage (with N2) and the ELPI (10 dm³/mn)



PM number (as measured with the ELPI) :

w/out thermodenuder : 5 x 10¹³ per km

with thermodenuder : (200 °C) = 4 x 10¹³ ; (300 °C) = 3 x 10¹³ per km



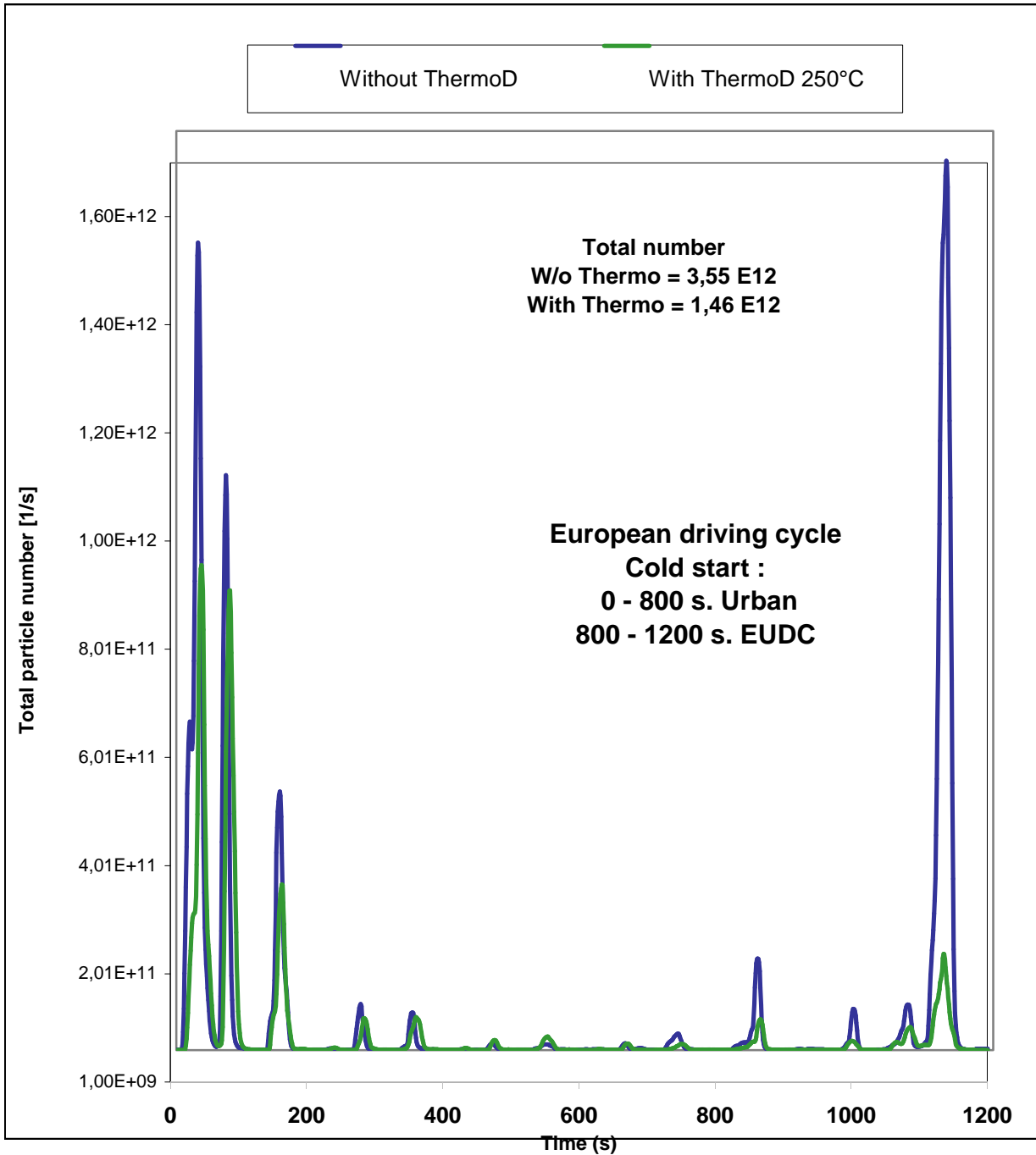
SIZE / Number distribution as a function of the thermodesorber settings

conclusion : the thermodesorber will reduce the PM number without affecting the distribution
no real need ! ; additional drawbacks : maintenance, response lag, desorption,...

RENAULT

GASOLINE CAR (Euro 3) - 1,6 MPI - 16V : Gasoline Fuel with 127 ppm S

ELPI : 10 nm - 10 microns - 13 channels - 1 Hz - greased Aluminium plates

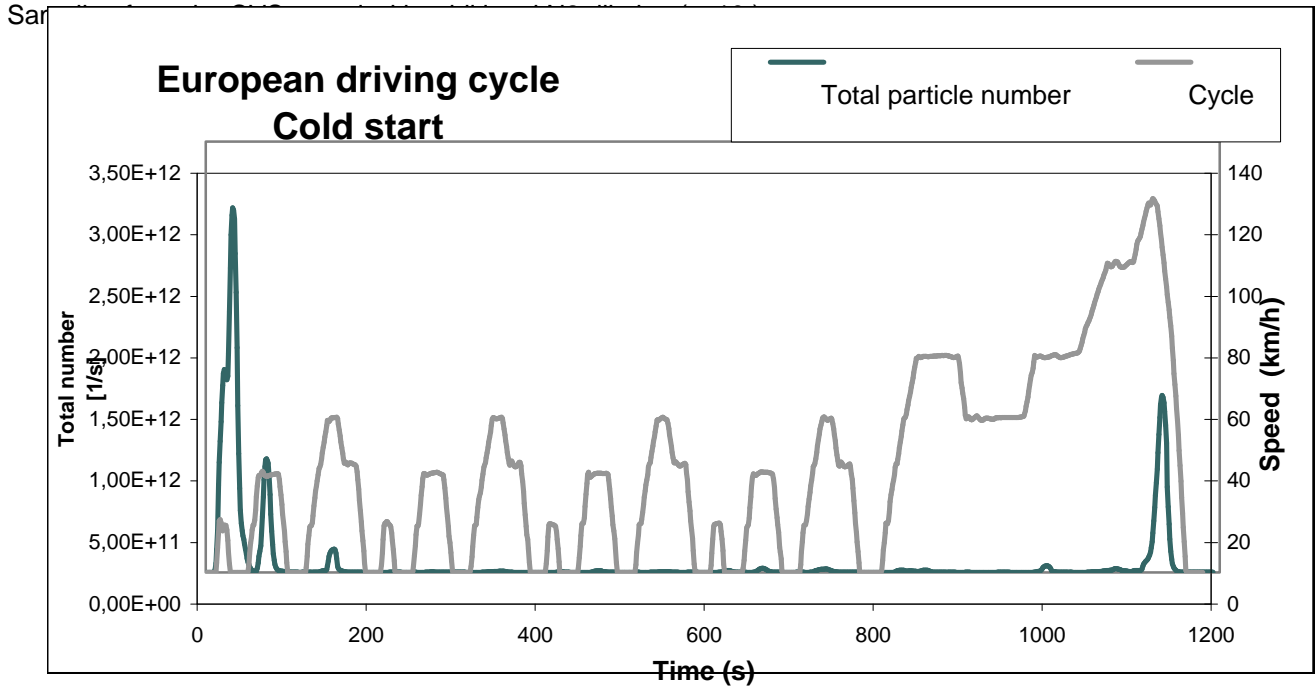
thermodenuder : installed between the dilution stage (with N₂) and the ELPI (10 dm³ / mn)Sampling from the CVS tunnel with additional N₂ dilution (x 10)

the presence of the thermodenuder drastically affect the PM measurements (number, composition) and will induced possible sudden desorption, some maintenance concerns and response time lag, ...

GASOLINE CAR (Euro 3) - 1,6 MPI - 16V : Gasoline Fuel with 127 ppm S

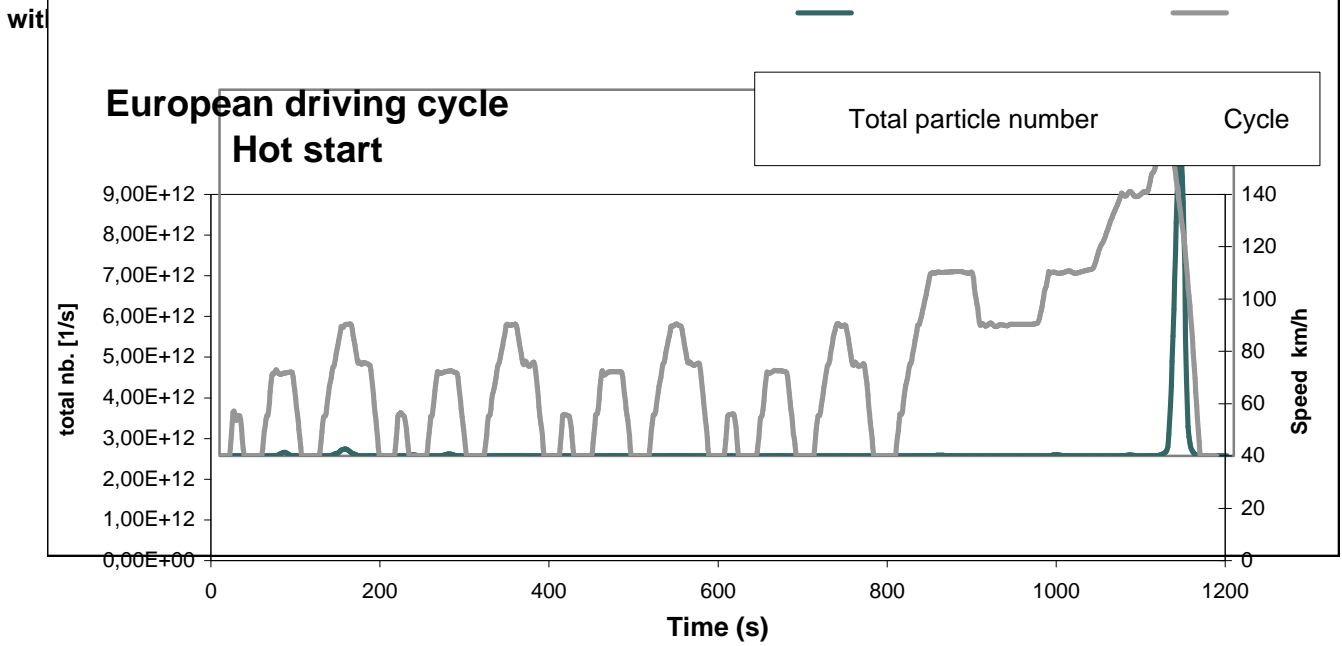
RENAULT

ELPI : 10 nm - 10 microns - 13 channels - 1 Hz - greased Aluminium plates
WITHOUT the thermodenuder



without thermodenuder

PM emissions depending on the thermal engine conditions : COLD / HOT START

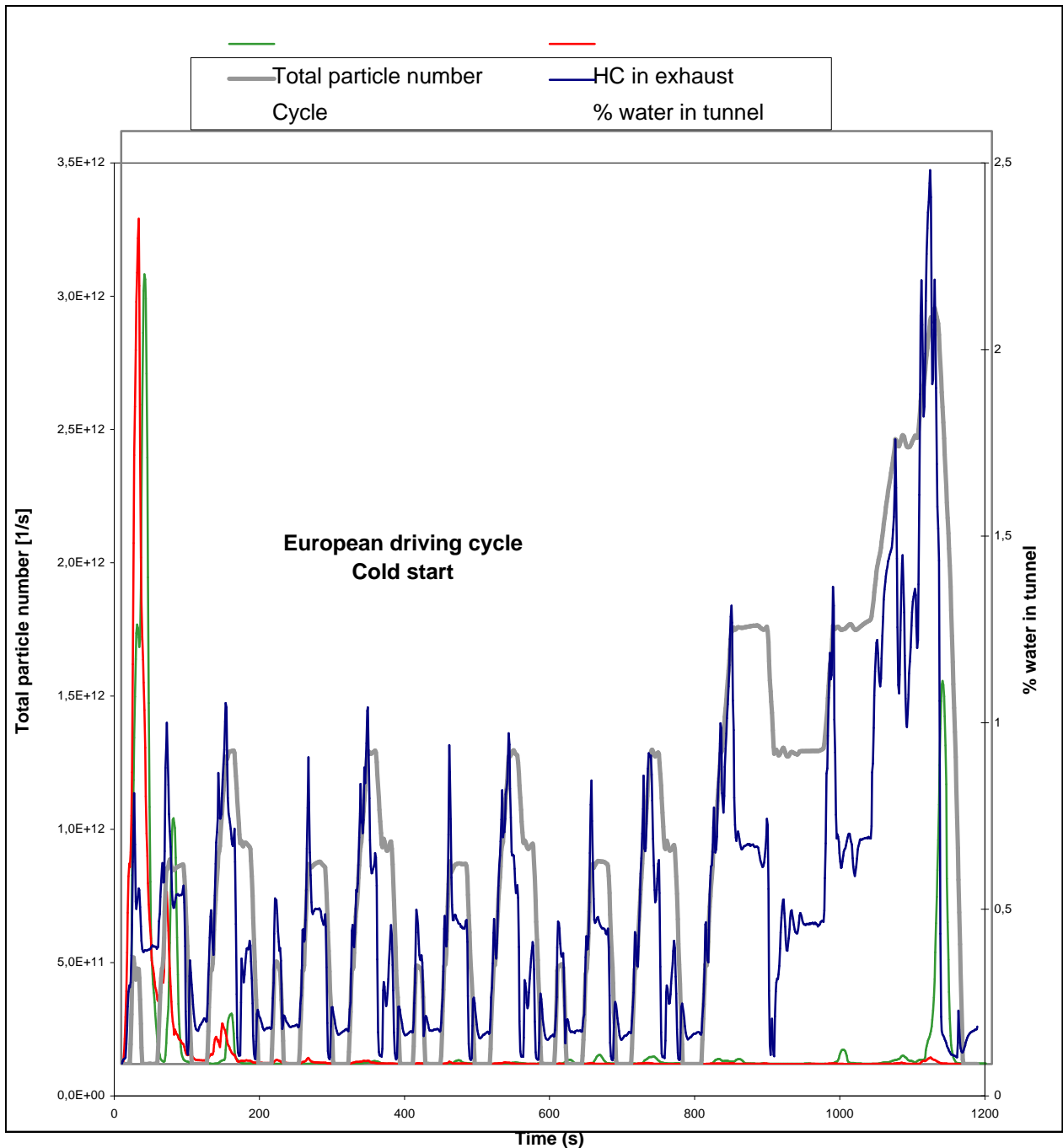


RENAULT

GASOLINE CAR (Euro 3) - 1,6 MPI - 16V : Gasoline Fuel with 127 ppm S

ELPI : 10 nm - 10 microns - 13 channels - 1 Hz - greased Aluminium plates
WITHOUT the thermodenuder

Sampling from the CVS tunnel with additional N2 dilution (x 10)



the effect of the thermodenuder is mainly on water , and not on Hydrocarbons

proposal / recommendations :

to avoid measurement interference with water , a dilution with warm N2 is recommended, and so :

*the thermodenuder is not any longer needed : no maintenance , no additional response lag, no sudden release, ...

nota : water concentrations in the exhaust are estimated from calculations (combustion products)

