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CONVERGE

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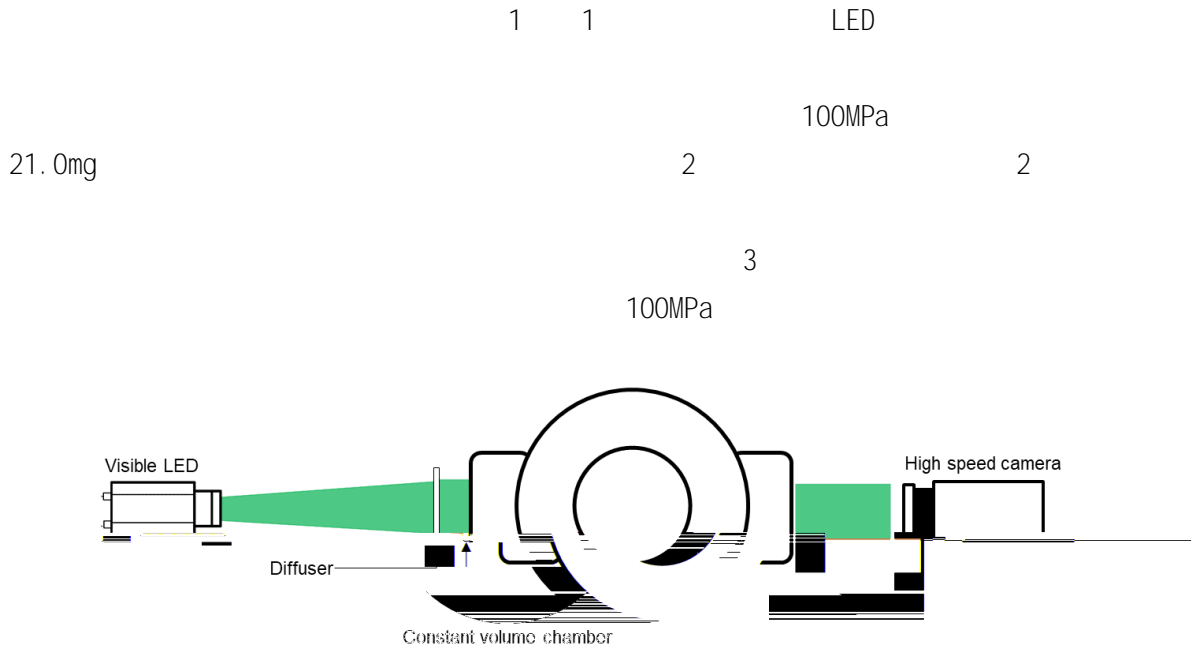


Figure 1. Schematic of the experimental setup.

Table 1. Experimental conditions

Ambient Conditions		
Ambient Gas Component	nitrogen	nitrogen
Ambient Pressure	100 kPa	atmospheric
Ambient Temperature	300 K	Ambient
Injection Conditions		
Injection Pressure	80, 100, 120 MPa	High Pressure
Injection Duration	0.6 ms	Injection pulse
Injector Conditions		
Injector type	Solenoid actuator type	Injection
Number of Holes	1	Number
Hole Diameter (mm)	0.32	Hole Diameter

Table 2. Fuel properties

	M-35#	J-35#
Kinetic viscosity [mm ² /s]	3.352	3.738
Boiling point [°C]	68	75
Density [kg/m ³]	817	832.7
Cetane number	42.3	49
Surface tension [mN/m]	27.00	28.00

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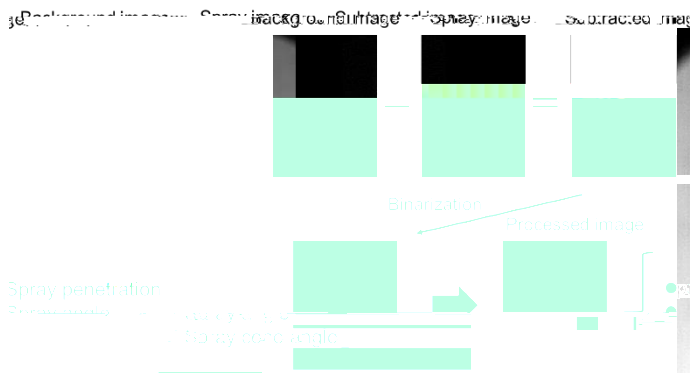


Figure 2. Image processing procedure.

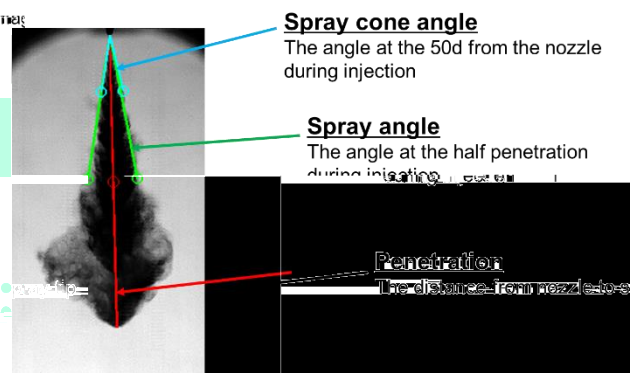


Figure 3. The definition of the spray parameters

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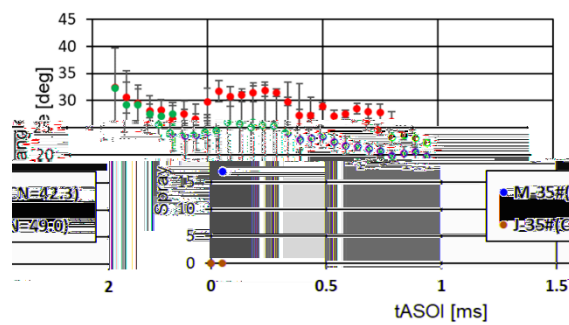
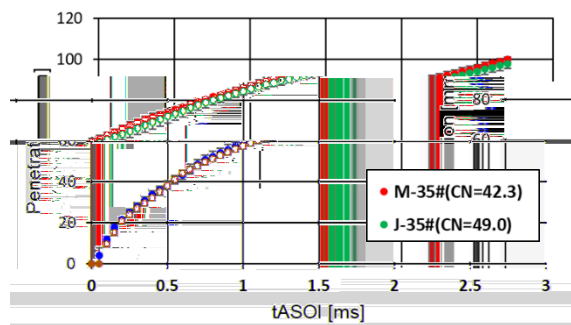


Figure 4. The penetration (left) and spray angle (right) under injection pressure of 100MPa.

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Table 3. Calculation condition.

Spray modeling	
Turbulence model	RNG k-ε
Grid size [mm]	0.25 0.50
nozzle hole	Initial droplet size
KH-RT	Breakup model
Injection condition	
Injection duration [ms]	1.55
Injection amount [mg/rev]	21.6
Ambient temperature [K]	850
Ambient pressure [MPa]	4.38

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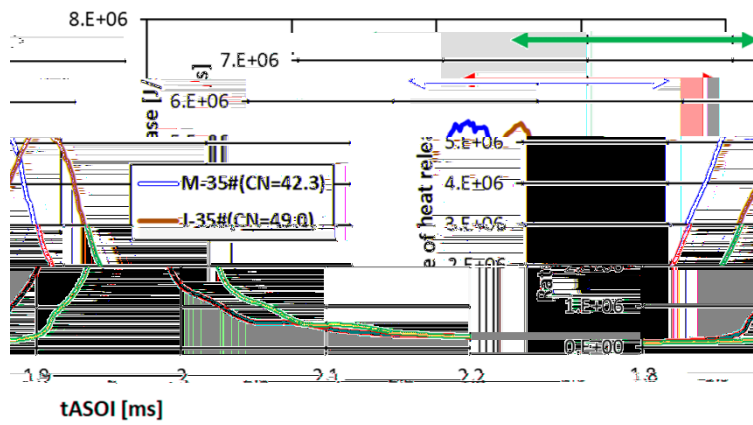


Figure 5. The rate of heat release of different kind of fuels.

0.18ms ASOI

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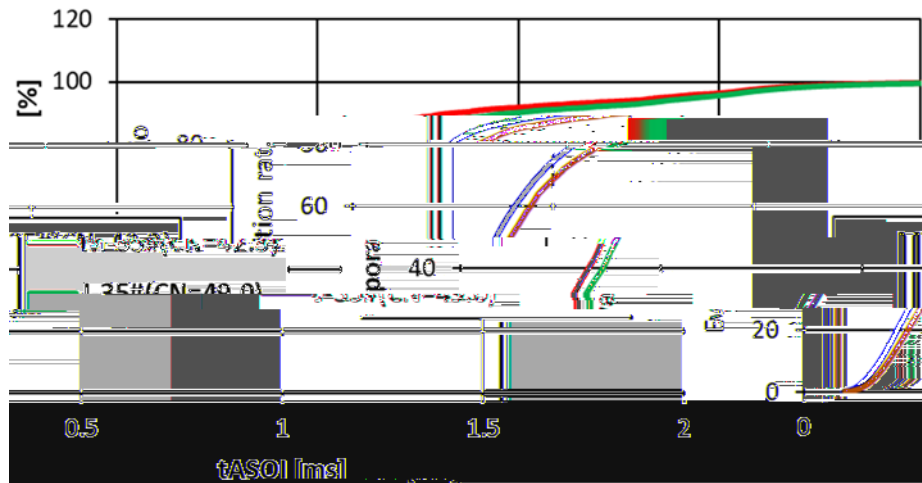


Figure 6. The evaporation ratio of different kind of fuels.

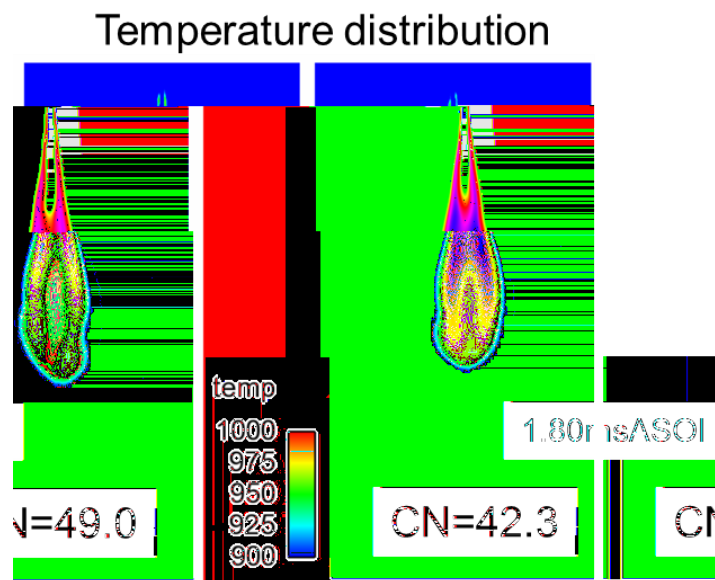


Figure 7. The temperature distribution inside the spray before ignition occurred.

