

Índice

Agradecimientos	XI
Resumen	XIII
Índice	XVIII
Índice de figuras	XXI
Índice de Tablas	XXVI
Lista de abreviaturas	XXVII
Símbolos latinos	XXIX
Símbolos griegos	XXXIII
1 Planteamiento de la tesis	1
1.1. Introducción	1
1.2. Objetivos y estructura de la tesis	22
Bibliografía	25
2 Influencia de la geometría en el flujo interno: efectos termo-hidráulicos	43
2.1. Introduction	45
2.2. Experimental facilities	47
Geometric characterization of the calibrated orifice	47
Geometric characterization for the nozzle orifices	50
Fuel properties determination	51
2.3. Numerical approach	54
Computational model and governing equations	54
Mesh description, simulation cases and model setup	55
2.4. Calibrated OZ orifice calculation	57
2.5. Nozzle orifice calculation	63
2.6. Conclusions	67
References	69

3	Influencia de la geometría en los procesos de inyección-combustión	75
3.1.	Acknowledgement	77
3.2.	Introduction	78
	State of the art	78
	Scope, objectives and benefits	79
	Methodology and program architecture	80
3.3.	Experimental facilities and experimental and computational techniques	81
	Nozzles description and Hydraulic characterization: mass flow rate and momentum flux test rigs	82
	Spray characterization test rig. Mie-scattering and Schlieren techniques	83
	Internal nozzle flow and spray modelling: Eulerian and discrete droplet model approaches	84
	Engine combustion modelling	85
	Single cylinder engine test bench and set-up	86
	Heat flux calculation	92
3.4.	Results and analysis	94
	Step 1: characterization of the reference combustion system	94
	Step 2. Second nozzle characterization and Optimization	101
	Results of step 2 (phase 2): Optimized geometry	108
	Single cylinder engine tests	111
3.5.	Summary and conclusions	119
	References	121
4	Influencia de geometrías elípticas sobre la mezcla	125
4.1.	Introduction	126
4.2.	Model description	129
4.3.	Methodology	132
4.4.	Model validation	136
4.5.	Results and discussion	144
4.6.	Conclusions	158
	References	161
5	Influencia de la convergencia de la sección en toberas elípticas sobre la mezcla	173
5.1.	Introduction	174
5.2.	Model description	176
5.3.	Validation of the model	179
5.4.	Applicational to elliptical nozzles	188
	Setup	188
	Results	189
5.5.	Conclusions	201
	References	205

6	Discusión de los resultados	213
6.1.	Comentarios finales a los resultados	213
7	Conclusiones y trabajos futuros	219
7.1.	Conclusiones	219
7.2.	Trabajos futuros	221