processes

Supplementary Materials

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Table S1: A sample of operational conditions

$\dot{m}_L$ (kg/h)	$u_r(\dot{m}_L)$(%)	$\dot{m}_G$ (kg/h)	$u_r(\dot{m}_G)$ (%)	*GLR* (%)	u_r(*GLR*) (%)
19.97	2.5	0.207	9.2	1.0	9.6
17.97	3.3	0.264	7.2	1.5	7.9
15.97	3.4	0.327	5.8	2.0	6.8
13.98	3.7	0.436	4.4	3.1	5.7
11.98	2.5	0.452	4.2	3.8	4.9
11.58	2.5	0.459	4.2	4.0	4.9
11.18	2.5	0.477	4.0	4.3	4.7
10.78	2.5	0.487	3.9	4.5	4.7
10.38	2.5	0.507	3.8	4.9	4.5
9.98	2.5	0.523	3.7	5.2	4.4
9.58	2.5	0.549	3.5	5.7	4.3
9.18	2.5	0.568	3.4	6.2	4.2
8.78	2.5	0.614	3.1	7.0	4.0
8.39	2.5	0.633	3.0	7.5	3.9
7.99	2.5	0.656	2.9	8.2	3.8
7.59	2.5	0.687	2.8	9.1	3.7
7.19	2.5	0.720	2.7	10.0	3.6
6.79	2.5	0.763	2.5	11.2	3.5
6.39	2.5	0.784	2.4	12.3	3.5
5.99	2.5	0.812	2.4	13.6	3.4
5.59	3.2	0.826	2.3	14.8	4.0
5.19	3.3	0.851	2.2	16.4	4.0
4.79	3.4	0.879	2.2	18.4	4.1
4.39	3.6	0.901	2.1	20.5	4.2
3.99	3.8	0.928	2.1	23.3	4.3
3.59	4.0	0.952	2.0	26.5	4.4
3.19	4.2	0.981	1.9	30.8	4.6
2.80	4.6	1.021	1.9	36.5	4.9
2.50	2.5	1.043	1.8	41.7	3.1
2.40	2.5	1.045	1.8	43.5	3.1
2.30	2.5	1.053	1.8	45.8	3.1
2.20	2.5	1.056	1.8	48.0	3.1
2.10	2.5	1.062	1.8	50.6	3.1
2.00	2.5	1.069	1.8	53.5	3.1
1.90	2.5	1.075	1.8	56.6	3.1
1.80	2.5	1.082	1.8	60.1	3.1
1.70	2.5	1.089	1.8	64.1	3.1

u_r is the relative uncertainty.

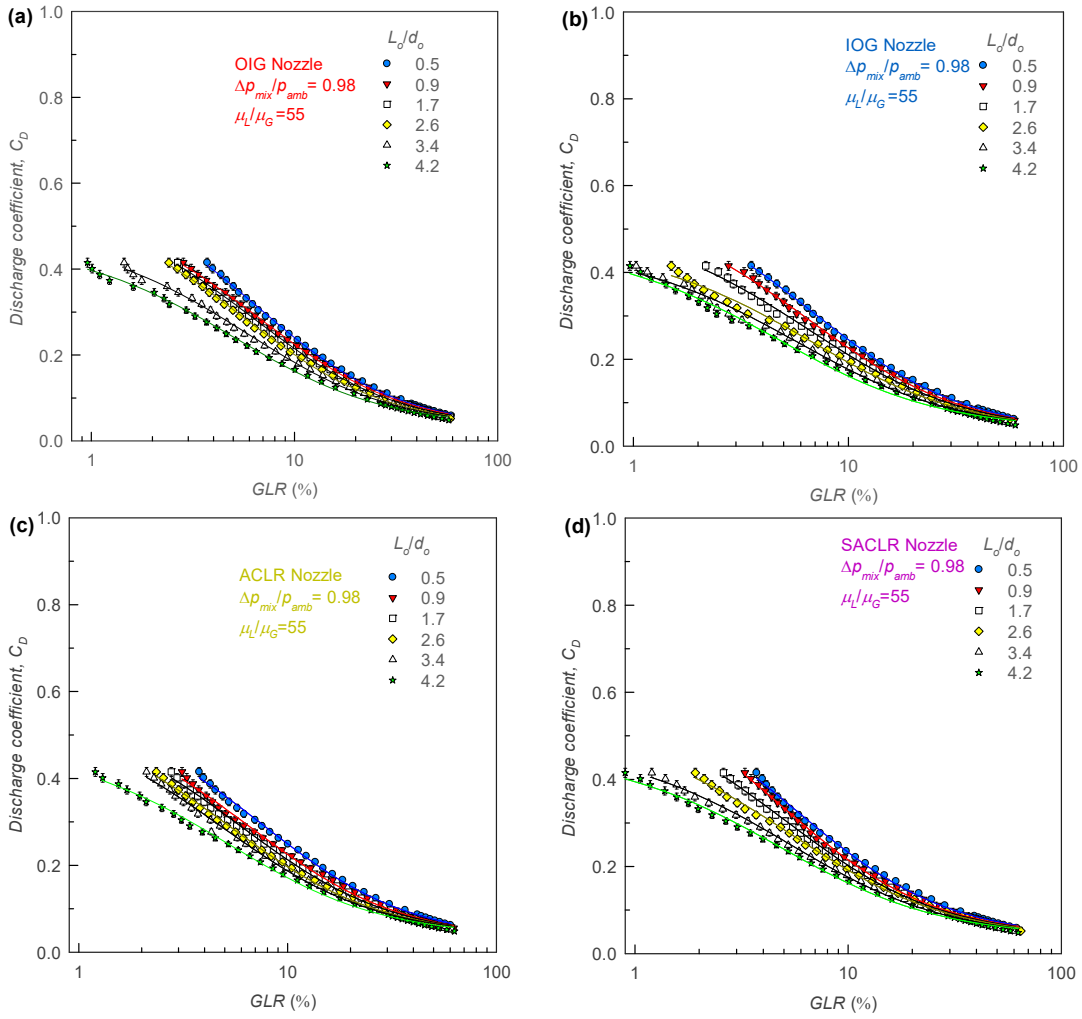
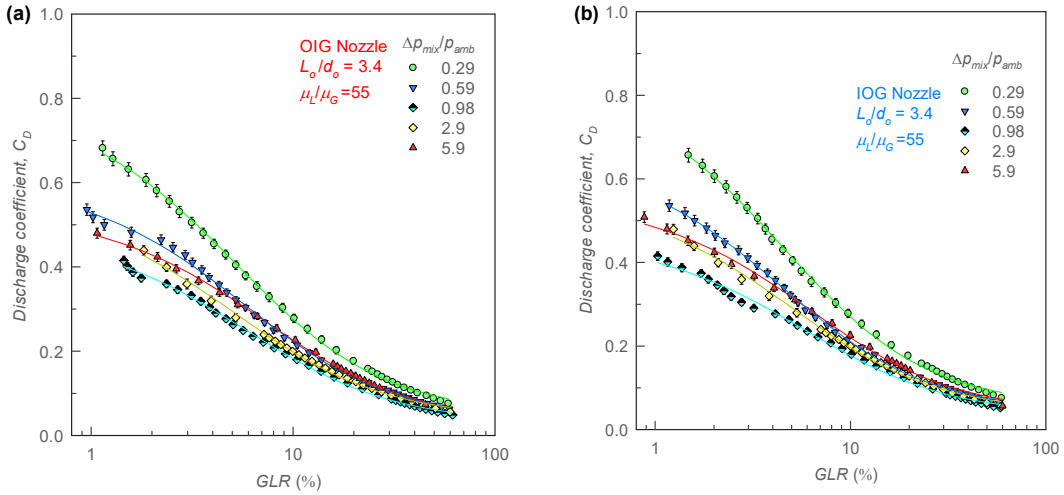


Figure S1. Effect of GLR on C_D at different L_o/d_o for different nozzles: (**a**) OIG; (**b**) IOG; (**c**) ACLR; and (**d**) SACLR.



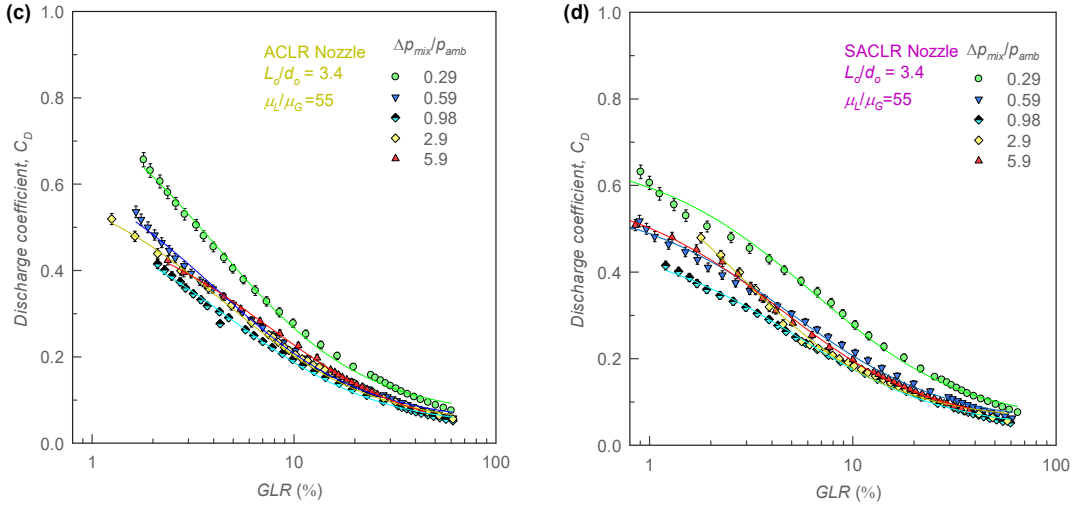


Figure S2. Effect of GLR on C_D at different $\Delta p_{mix}/p_{amb}$ for different nozzles: (**a**) OIG; (**b**) IOG; (**c**) ACLR; and (**d**) SACLR.

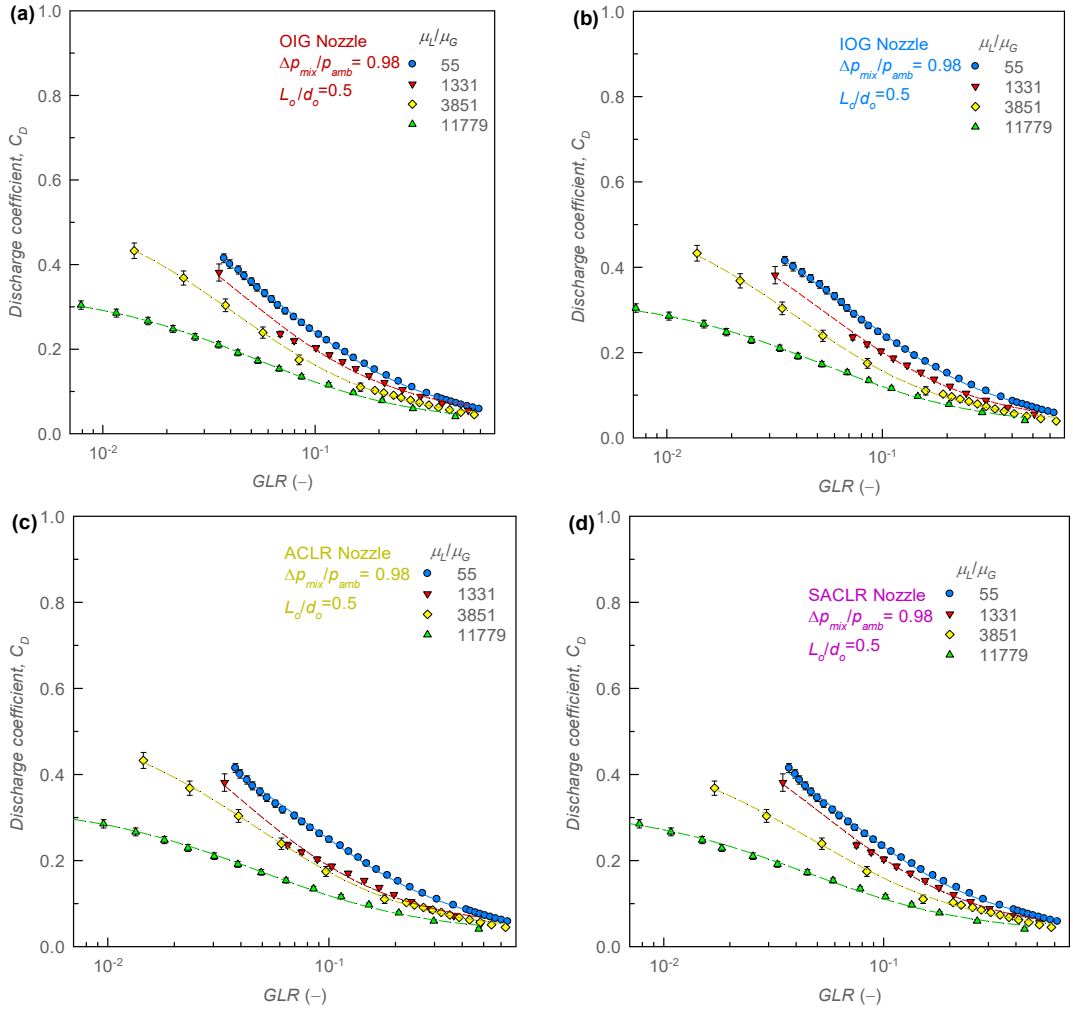


Figure S3. Effect of GLR on C_D at varying μ_L/μ_G for different nozzles: (**a**) OIG; (**b**) IOG; (**c**) ACLR; and (**d**) SACLR.

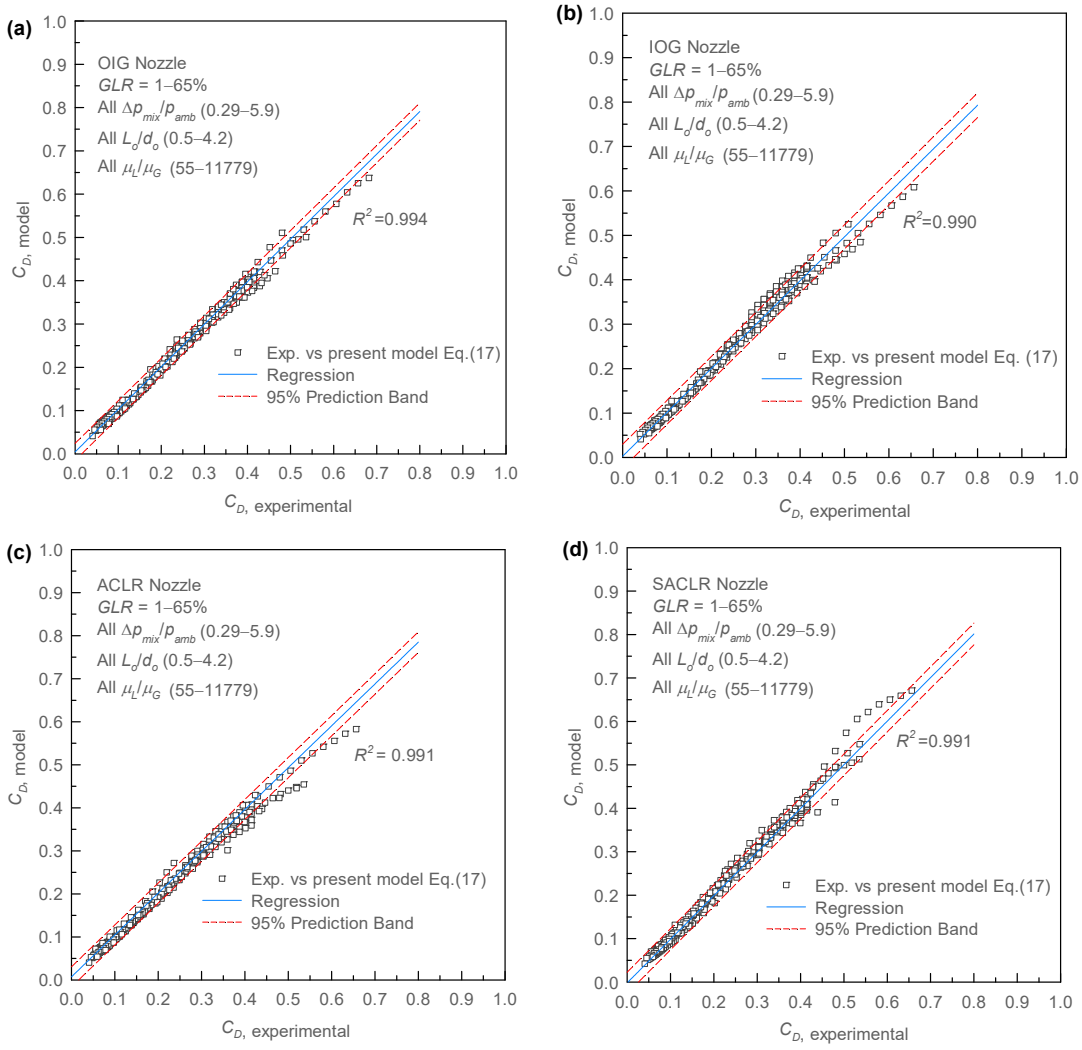


Figure S4. Comparison of the experimental and predicted C_D from the present model Eq. (17) for different nozzles: (a) OIG, (b) IOG, (c) ACLR, and (d) SACLR