Our experimental data for the paper: “Heat transfer correlation of the falling film evaporation on a single horizontal smooth tube”

Paper link: http://www.sciencedirect.com/science/article/pii/S1359431116302332

Table 1 D_o = 16 mm, q = 20 kWm^{-2}, T_{sat} = 6 ℃, $\Delta T = T_{e,in} - T_{e,out}$

ΔT, ℃	Φ, W	Re	h_o, Wm^{-2}K^{-1}
1.30	1626.1	1873.1	4279.3
1.30	1629.8	1762.6	4354.3
1.27	1587.2	1644.9	4165.1
1.27	1596.0	1525.8	4163.0
1.28	1601.0	1415.3	4121.6
1.25	1564.6	1291.8	3994.1
1.24	1553.4	1162.6	3901.1
1.24	1548.3	1046.4	3844.8
1.24	1555.9	927.2	3686.3
1.29	1614.8	793.7	3797.9
1.27	1588.5	654.5	3506.6
1.25	1565.9	579.9	3126.6

Note: 654.5 denotes the $Re_{threshold}$, the cases of $Re > Re_{threshold}$ are fully wetting (the same in following tables).

Table 2 D_o = 16 mm, q = 40 kWm^{-2}, T_{sat} = 6 ℃, $\Delta T = T_{e,in} - T_{e,out}$

ΔT, ℃	Φ, W	Re	h_o, Wm^{-2}K^{-1}
2.52	3193.7	2008.1	6306.5
2.47	3132.7	1868.8	6030.3
2.46	3126.4	1732.5	6034.3
2.47	3136.6	1588.9	6069.6
2.48	3150.5	1455.4	5810.3
2.48	3141.6	1319.1	5671.9
2.48	3148.0	1187.0	5583.8
2.46	3116.3	1057.9	5279.3
2.50	3167.0	924.4	5149.1
2.49	3158.1	790.9	4990.0
2.48	3142.9	656.0	4528.3
2.51	3184.8	601.4	4206.2

Table 3 D_o = 16 mm, q = 60 kWm^{-2}, T_{sat} = 6 ℃, $\Delta T = T_{e,in} - T_{e,out}$

ΔT, ℃	Φ, W	Re	h_o, Wm^{-2}K^{-1}
3.75	4754.3	2310.9	7881.9
3.72	4717.5	2141.5	7841.9
3.73	4734.0	1979.3	7681.6
3.73	4728.5	1818.6	7388.0
3.74	4740.4	1657.8	7346.0
3.77	4788.6	1495.6	7018.8
3.74	4748.0	1344.9	6635.4
3.74	4739.1	1189.9	6392.9
3.74	4739.1	1042.1	5930.2
3.75	4763.2	887.0	5365.4

Table 4 D_o = 19.05 mm, q = 20 kWm^{-2}, T_{sat} = 6 ℃, $\Delta T = T_{e,in} - T_{e,out}$

ΔT, ℃	Φ, W	Re	h_o, Wm^{-2}K^{-1}
1.01	1997.2	2097.0	5546.4
1.01	1997.2	1940.6	5490.3
0.98	1949.5	1788.4	4961.7
1.02	2019.0	1657.8	5092.0
1.04	2062.7	1593.2	4986.9
1.03	2038.8	1537.3	5037.8
1.03	2038.8	1415.3	4951.4
1.01	1999.1	1286.1	4799.4
1.00	1991.2	1191.3	4651.2
1.04	2056.7	1073.6	4655.2
1.01	2011.0	955.9	4477.2
1.01	2007.1	862.6	3871.1
1.02	2019.0	746.4	3520.2

Table 5 D_o = 19.05 mm, q = 40 kWm^{-2}, T_{sat} = 6 ℃, $\Delta T = T_{e,in} - T_{e,out}$

ΔT, ℃	Φ, W	Re	h_o, Wm^{-2}K^{-1}
1.86	3674.3	1942.9	6897.7
1.83	3624.8	1798.2	6795.1
1.84	3650.5	1714.3	6760.3
1.85	3660.4	1670.9	6773.8
1.84	3648.6	1542.2	6647.6
1.84	3636.7	1397.5	6575.7
1.86	3678.3	1302.0	6347.6
1.86	3688.2	1226.8	6256.6
1.86	3676.3	1144.3	6106.9
1.85	3662.4	1057.5	5882.2

1.88	3714.0	1012.7	5837.7
1.85	3664.4	967.8	5724.5
1.84	3652.5	925.9	5634.4
1.86	3692.2	875.2	5888.6
1.86	3676.3	830.4	5642.0
1.84	3636.7	784.1	5465.3
1.82	3612.9	737.8	5042.0
1.84	3636.7	687.2	4870.0
1.84	3634.7	636.5	4612.3
1.80	3571.2	584.5	4194.9

Table 6 D_o = 19.05 mm, q = 60 kWm^{-2}, T_{sat} = 6 ℃, $\Delta T = T_{e,\,in} - T_{e,\,out}$

ΔT, ℃	Φ, W	Re	h_o, Wm^{-2}K^{-1}
2.92	5796.1	1899.0	8128.5
2.92	5798.0	1765.5	8061.0
2.92	5796.1	1623.4	7896.0
2.92	5790.1	1514.3	7717.4
2.93	5804.0	1390.9	7487.5
2.91	5766.3	1268.9	7243.3
2.92	5784.2	1188.5	7005.1
2.92	5786.1	1126.8	6801.9
2.94	5837.7	1066.5	6673.7
2.94	5823.8	1046.4	6456.5
2.96	5861.5	986.1	6275.1
2.94	5833.7	934.4	6169.2
2.92	5790.1	885.6	5603.8
2.94	5827.8	752.1	5681.1
2.92	5798.0	703.3	5150.4
2.95	5843.7	653.1	4853.6

Table 7 D_o = 19.05 mm, q = 80 kWm^{-2}, T_{sat} = 6 ℃, $\Delta T = T_{e,\,in} - T_{e,\,out}$

ΔT, ℃	Φ, W	Re	h_o, Wm^{-2}K^{-1}
3.89	7667.5	1942.0	8955.8
3.87	7637.9	1802.8	8797.5
3.85	7598.4	1662.1	8627.7
3.86	7626.0	1518.6	8387.1
3.85	7602.3	1423.9	8052.4
3.87	7637.9	1301.9	7648.2
3.86	7626.0	1177.0	7138.4
3.86	7620.1	1089.4	6752.0
3.88	7657.6	994.7	6307.3
3.88	7649.7	874.1	6213.6
3.86	7618.1	831.1	6100.9
3.85	7594.5	789.4	5901.2

3.87	7628.0	746.4	5652.5
3.91	7723.4	713.4	5347.4

Table 8 D_o = 19.05 mm, q = 20 kWm^{-2}, T_{sat} = 10 ℃, $\Delta T = T_{e,\,in} - T_{e,\,out}$

ΔT, ℃	Φ, W	Re	h_o, Wm^{-2}K^{-1}
1.09	2159.1	2402.3	6328.6
1.08	2135.4	2236.3	6172.9
1.10	2161.1	2070.3	6217.0
1.09	2141.4	1919.4	6101.2
1.09	2141.4	1783.6	6041.4
1.09	2159.1	1626.7	5949.9
1.09	2157.2	1469.7	5815.7
1.08	2125.6	1302.2	5633.3
1.08	2131.5	1137.8	5393.8
1.07	2113.7	971.8	5253.6
1.10	2176.9	881.2	5459.6
1.07	2105.8	751.5	4835.8
1.06	2099.9	614.1	4562.4

Table 9 D_o = 19.05 mm, q = 40 kWm^{-2}, T_{sat} = 10 ℃, $\Delta T = T_{e,\,in} - T_{e,\,out}$

ΔT, ℃	Φ, W	Re	h_o, Wm^{-2}K^{-1}
2.05	4051.8	2201.6	7754.2
2.02	3988.7	2047.7	7598.2
2.03	4014.3	1896.8	7577.6
2.01	3970.9	1744.4	7447.8
2.00	3947.2	1596.5	7240.5
2.01	3961.0	1463.7	7129.7
2.04	4032.1	1326.4	6906.6
2.02	3994.6	1180.0	6677.7
2.02	3980.8	1047.2	6449.6
2.01	3963.0	950.6	6173.3
1.99	3935.4	845.0	5641.2
2.04	4022.2	737.9	5395.2

Table 10 D_o = 19.05 mm, q = 60 kWm^{-2}, T_{sat} = 10 ℃, $\Delta T = T_{e,\,in} - T_{e,\,out}$

ΔT, ℃	Φ, W	Re	h_o, Wm^{-2}K^{-1}
2.95	5828.1	2085.4	9186.6
2.97	5861.6	1939.0	9256.9
2.94	5802.4	1789.6	8892.8
2.93	5784.7	1647.8	8671.3
2.94	5802.4	1519.5	8384.5
2.94	5796.5	1386.7	8112.5
2.96	5839.9	1287.1	7809.1
2.93	5780.7	1171.0	7507.8

2.97	5861.6	1017.0	6958.0
2.98	5877.4	949.1	6690.8
2.93	5784.7	839.0	6104.4
2.98	5871.5	683.6	5210.6
2.94	5794.5	624.7	5554.6

Table 11 D_o = 19.05 mm, q = 80 kWm^{-2}, T_{sat} = 10 ℃, $\Delta T = T_{e,\,in} - T_{e,\,out}$

ΔT, ℃	Φ, W	Re	h_o, Wm^{-2}K^{-1}
3.84	7582.6	2384.2	9413.5
3.84	7576.7	2234.8	9461.9
3.84	7584.6	2079.3	9339.7
3.79	7483.9	1914.9	9124.9
3.80	7507.6	1762.5	8881.8
3.82	7537.2	1607.0	8075.4
3.85	7604.3	1447.1	7649.1
3.81	7521.4	1300.7	7126.3
3.79	7487.9	1134.7	6657.0
3.83	7549.1	1039.7	6208.8

Table 12 D_o = 19.05 mm, q = 20 kWm^{-2}, T_{sat} = 16 ℃, $\Delta T = T_{e,\,in} - T_{e,\,out}$

ΔT, ℃	Φ, W	Re	h_o, Wm^{-2}K^{-1}
1.05	2074.3	2697.3	7166.4
1.04	2058.5	2510.3	7128.3
1.03	2036.8	2323.4	6991.9
1.03	2040.7	2138.0	6881.8
1.03	2024.9	1955.9	6688.3
1.02	2011.1	1775.4	6459.4
1.04	2054.5	1608.0	6482.8
1.02	2013.1	1450.3	6258.6
1.06	2090.1	1279.6	6106.7
1.04	2058.5	1097.5	5832.4
1.06	2086.1	907.2	5670.4

Table 13 D_o = 19.05 mm, q = 40 kWm^{-2}, T_{sat} = 16 ℃, $\Delta T = T_{e,\,in} - T_{e,\,out}$

ΔT, ℃	Φ, W	Re	h_o, Wm^{-2}K^{-1}
2.01	3972.9	2354.3	9074.5
2.02	3984.7	2193.3	8967.0
2.02	3980.8	2030.7	8785.7
2.01	3970.9	1873.0	8726.4
2.02	3976.8	1726.7	8483.7
2.05	4042.0	1582.0	8374.7
2.01	3970.9	1440.5	8022.2
2.01	3976.8	1297.4	7705.2
2.04	4022.2	1160.9	7414.1

2.05	4045.9	1055.2	7193.8
2.05	4040.0	947.9	6972.6
2.01	3968.9	884.5	5522.6

Table 14 D_o = 19.05 mm, q = 60 kWm^{-2}, T_{sat} = 16 ℃, $\Delta T = T_{e,\,in} - T_{e,\,out}$

ΔT, ℃	Φ, W	Re	h_o, Wm^{-2}K^{-1}
2.87	5660.3	2409.5	8588.1
2.85	5614.9	2247.0	8416.4
2.83	5595.2	2089.2	8352.4
2.86	5636.6	1934.8	8472.4
2.81	5555.7	1778.7	8045.0
2.84	5603.1	1630.7	7793.0
2.82	5567.6	1479.5	7425.7
2.84	5601.1	1328.3	7145.1
2.84	5603.1	1186.9	6760.6
2.83	5575.5	1082.8	6454.1
2.82	5559.7	973.9	6091.2
2.82	5567.6	852.0	5621.6

Table 15 D_o = 19.05 mm, q = 80 kWm^{-2}, T_{sat} = 16 ℃, $\Delta T = T_{e,\,in} - T_{e,\,out}$

ΔT, ℃	Φ, W	Re	h_o, Wm^{-2}K^{-1}
3.72	7337.9	2325.0	8878.0
3.72	7349.7	2181.9	8808.2
3.73	7359.6	2043.7	8749.1
3.72	7345.8	1905.5	8263.2
3.73	7353.7	1767.3	8252.5
3.74	7389.2	1629.1	8004.6
3.75	7395.1	1495.8	7573.0
3.73	7359.6	1336.5	7066.1
3.76	7418.8	1183.6	6669.8
3.76	7414.9	1030.8	6066.5

Table 16 D_o = 25.35 mm, q = 20 kWm^{-2}, T_{sat} = 6 ℃, $\Delta T = T_{e,\,in} - T_{e,\,out}$

ΔT, ℃	Φ, W	Re	h_o, Wm^{-2}K^{-1}
0.70	2501.2	2081.3	5823.3
0.70	2508.4	1937.7	5792.1
0.70	2512.0	1791.3	5827.4
0.70	2501.2	1650.7	5776.7
0.68	2429.3	1515.7	5364.7
0.67	2422.1	1372.2	5257.6
0.68	2436.5	1241.6	5194.3
0.68	2443.7	1106.7	5028.6
0.66	2382.6	961.7	4672.0
0.70	2504.8	828.2	4520.7

0.69	2479.6	678.9	3722.9
0.69	2472.4	581.3	3124.3

Table 17 D_o = 25.35 mm, q = 40 kWm^{-2}, T_{sat} = 6 ℃, $\Delta T = T_{e,\,in} - T_{e,\,out}$

ΔT, ℃	Φ, W	Re	h_o, Wm^{-2}K^{-1}
1.39	5049.7	2033.9	7331.1
1.39	5038.8	1884.6	7319.5
1.38	4999.0	1746.8	7020.7
1.38	4984.5	1611.9	6825.2
1.39	5038.8	1474.1	6650.5
1.39	5035.2	1340.6	6520.4
1.38	4991.7	1207.1	6282.0
1.40	5057.0	1073.6	5896.8
1.40	5078.7	940.2	5501.9
1.42	5151.2	803.8	5364.7
1.37	4977.2	690.4	4607.5

Table 18 D_o = 25.35 mm, q = 60 kWm^{-2}, T_{sat} = 6 ℃, $\Delta T = T_{e,\,in} - T_{e,\,out}$

ΔT, ℃	Φ, W	Re	h_o, Wm^{-2}K^{-1}
2.06	7424.5	2219.1	8747.0
2.05	7356.2	2068.3	8581.0
2.07	7453.3	1919.1	8374.0
2.07	7456.9	1775.5	7979.8
2.06	7399.4	1621.9	7586.7
2.07	7446.1	1451.1	7085.0
2.07	7438.9	1306.2	6760.5
2.07	7442.5	1152.6	6238.0
2.06	7395.8	1001.9	5583.0