

LAMPIRAN 1

Tabel 1 Data Pengujian Temperatur Ruang Bakar *Perforated Burner*

Bahan Alumunium dengan Selubung

Waktu (detik)	Temperatur Air (°C)	Ruang Bakar 1 (°C)	Ruang Bakar 2 (°C)	Ruang Bakar 3 (°C)	Temperatur Rata-Rata Ruang Bakar (°C)
60	30.9	418	556	430	468.00
120	37.1	425	587	440	484.00
180	43.4	439	590	453	494.00
240	49.7	456	606	467	509.67
300	56.1	466	600	478	514.67
360	62.4	474	605	489	522.67
420	68.7	477	620	496	531.00
480	74.9	477	623	505	535.00
540	80.8	458	621	515	531.33
600	86.3	465	607	510	527.33
660	91.4	469	609	511	529.67
669	92	469	611	508	529.33

Tabel 2 Data Pengujian Temperatur Ruang Bakar *Perforated Burner*

Bahan Alumunium dan Penambahan *Grid* Ketebalan 1 mm dengan Selubung

Waktu (detik)	Temperatur Air (°C)	Ruang Bakar 1 (°C)	Ruang Bakar 2 (°C)	Ruang Bakar 3 (°C)	Temperatur Rata-Rata Ruang Bakar (°C)
60	30.7	407	582	511	500.00
120	36.9	411	625	540	525.33
180	43.2	426	631	537	531.33
240	50.1	437	632	543	537.33
300	57.2	448	633	537	539.33
360	64.1	460	632	542	544.67
420	70.7	463	632	540	545.00
480	77.2	468	624	585	559.00
540	83.4	473	624	587	561.33
600	89.1	480	625	588	564.33
631	92	481	625	589	565.00

Tabel 3 Data Pengujian Temperatur Ruang Bakar *Perforated Burner*Bahan Alumunium dan Penambahan *Grid* Ketebalan 3 mm dengan Selubung

Waktu (detik)	Temperatur Air (°C)	Ruang Bakar 1 (°C)	Ruang Bakar 2 (°C)	Ruang Bakar 3 (°C)	Temperatur Rata-Rata Ruang Bakar (°C)
60	30.6	403	559	552	504.67
120	36.7	448	577	564	529.67
180	43.1	452	580	568	533.33
240	49.9	461	582	573	538.67
300	57.1	463	578	593	544.67
360	64.6	468	590	603	553.67
420	71.3	464	607	603	558.00
480	78.3	462	615	602	559.67
540	84.7	463	635	600	566.00
600	90.6	467	640	605	570.67
617	92	468	653	610	577.00

Tabel 4 Data Pengujian Temperatur Ruang Bakar *Perforated Burner*Bahan Alumunium dan Penambahan *Grid* Ketebalan 5 mm dengan Selubung

Waktu (detik)	Temperatur Air (°C)	Ruang Bakar 1 (°C)	Ruang Bakar 2 (°C)	Ruang Bakar 3 (°C)	Temperatur Rata-Rata Ruang Bakar (°C)
60	30.5	403	614	511	509.33
120	36.5	415	653	535	534.33
180	42.9	423	654	541	539.33
240	49.7	427	659	573	553.00
300	56.9	431	660	588	559.67
360	65.3	428	664	596	562.67
420	72.5	435	668	607	570.00
480	79.6	438	669	602	569.67
540	86.4	463	671	611	581.67
597	92	474	673	622	589.67

LAMPIRAN 2

Tabel A-3 Properties of Common Liquids, Solids, and Foods

TABLE A-3							
Properties of common liquids, solids, and foods							
(a) Liquids							
Substance	Boiling data at 1 atm		Freezing data		Liquid properties		
	Normal boiling point, °C	Latent heat of vaporization h_{fg} , kJ/kg	Freezing point, °C	Latent heat of fusion h_{if} , kJ/kg	Temperature, °C	Density ρ , kg/m ³	Specific heat c_p , kJ/kg·K
Ammonia	-33.3	1357	-77.7	322.4	-33.3	682	4.43
					-20	665	4.52
					0	639	4.60
					25	602	4.80
Argon	-185.9	161.6	-189.3	28	-185.6	1394	1.14
Benzene	80.2	394	5.5	126	20	879	1.72
Brine (20% sodium chloride by mass)	103.9	—	-17.4	—	20	1150	3.11
n-Butane	-0.5	385.2	-138.5	80.3	-0.5	601	2.31
Carbon dioxide	-78.4*	230.5 (at 0°C)	-56.6	—	0	298	0.59
Ethanol	78.2	838.3	-114.2	109	25	783	2.46
Ethyl alcohol	78.6	855	-156	108	20	789	2.84
Ethylene glycol	198.1	800.1	-10.8	181.1	20	1109	2.84
Glycerine	179.9	974	18.9	200.6	20	1261	2.32
Helium	-268.9	22.8	—	—	-268.9	146.2	22.8
Hydrogen	-252.8	445.7	-259.2	59.5	-252.8	70.7	10.0
Isobutane	-11.7	367.1	-160	105.7	-11.7	593.8	2.28
Kerosene	204-293	251	-24.9	—	20	820	2.00
Mercury	356.7	294.7	-38.9	11.4	25	13,560	0.139
Methane	-161.5	510.4	-182.2	58.4	-161.5	423	3.49
					-100	301	5.79
Methanol	64.5	1100	-97.7	99.2	25	787	2.55
Nitrogen	-195.8	198.6	-210	25.3	-195.8	809	2.06
					-160	596	2.97
Octane	124.8	306.3	-57.5	180.7	20	703	2.10
Oil (light)	—	—	—	—	25	910	1.80
Oxygen	-183	212.7	-218.8	13.7	-183	1141	1.71
Petroleum	—	230-384	—	—	20	640	2.0
Propane	-42.1	427.8	-187.7	80.0	-42.1	581	2.25
					0	529	2.53
					50	449	3.13
					-50	1443	1.23
Refrigerant-134a	-26.1	217.0	-96.6	—	-26.1	1374	1.27
					0	1295	1.34
					25	1207	1.43
					0	1000	4.22
Water	100	2257	0.0	333.7	25	997	4.18
					50	988	4.18
					75	975	4.19
					100	958	4.22
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LAMPIRAN 3

Tabel of Total Emisivity

NON-METALS

Material	Temp °F (°C)	ε-Emisivity	Material	Temp °F (°C)	ε-Emisivity	Material	Temp °F (°C)	ε-Emisivity
Adobe	68 (20)	.90	Granite	70 (21)	.45	Paints, Oil		
Asbestos			Gravel	100 (38)	.28	All colors	200 (93)	.92-.96
Board	100 (38)	.96	Gypsum	68 (20)	.80-.90	Black	200 (93)	.92
Cement	32-392 (0-200)	.96	Ice, Smooth	32 (0)	.97	Black Gloss	70 (21)	.90
Cement, Red	2500 (1371)	.67	Ice, Rough	32 (0)	.98	Camouflage Green	125 (52)	.85
Cement, White	2500 (1371)	.65	Lacquer			Flat Black	80 (27)	.88
Cloth	199 (93)	.90	Black	200 (93)	.96	Flat White	80 (27)	.91
Paper	100-700 (38-371)	.93	Blue, on Al Foil	100 (38)	.78	Gray-Green	70 (21)	.95
Slate	68 (20)	.97	Clear, on Al Foil (2 coats)	200 (93)	.08 (.09)	Green	200 (93)	.95
Asphalt, pavement	100 (38)	.93	Clear, on Bright Cu	200 (93)	.66	Lamp Black	209 (98)	.96
Asphalt, tar paper	68 (20)	.93	Clear, on Tarnished Cu	200 (93)	.64	Red	200 (93)	.95
Basalt	68 (20)	.72	Red, on Al Foil (2 coats)	100 (38)	.61 (.74)	White	200 (93)	.94
Brick			White	200 (93)	.95	Quartz, Rough, Fused	70 (21)	.93
Red, rough	70 (21)	.93	White, on Al Foil (2 coats)	100 (38)	.69 (.88)	Glass, 1.98 mm	540 (282)	.90
Gault Cream	2500-5000 (1371-2760)	.26-.30	Yellow, on Al Foil (2 coats)	100 (38)	.57 (.79)	Glass, 1.98 mm	1540 (838)	.41
Fire Clay	2500 (1371)	.75	Lime Mortar	100-500 (38-260)	.90-.92	Glass, 6.88 mm	540 (282)	.93
Light Buff	1000 (538)	.80	Limestone	100 (38)	.95	Glass, 6.88 mm	1540 (838)	.47
Lime Clay	2500 (1371)	.43	Marble, White	100 (38)	.95	Opaque	570 (299)	.92
Fire Brick	1832 (1000)	.75-.80	" Smooth, White	100 (38)	.56	Opaque	1540 (838)	.68
Magnesite, Refractory	1832 (1000)	.38	" Polished Gray	100 (38)	.75	Red Lead	212 (100)	.93
Gray Brick	2012 (1100)	.75	Mica	100 (38)	.75	Rubber, Hard	74 (23)	.94
Silica, Glazed	2000 (1093)	.88	Oil on Nickel			Rubber, Soft, Gray	76 (24)	.86
Silica, Unglazed	2000 (1093)	.80	0.001 Film	72 (22)	.27	Sand	68 (20)	.76
Sandlime	2500-5000 (1371-2760)	.59-.63	0.002 "	72 (22)	.46	Sandstone	100 (38)	.67
Carborundum	1850 (1010)	.92	0.005 "	72 (22)	.72	Sandstone, Red	100 (38)	.60-.83
Ceramic			Thick "	72 (22)	.82	Sawdust	68 (20)	.75
Alumina on Inconel	800-2000 (427-1093)	.69-.45	Oil, Linseed			Shale	68 (20)	.69
Earthenware, Glazed	70 (21)	.90	On Al Foil, uncoated	250 (121)	.09	Silica, Glazed	1832 (1000)	.85
Earthenware, Matte	70 (21)	.93	On Al Foil, 1 coat	250 (121)	.56	Silica, Unglazed	2012 (1100)	.75
Greens No. 5210-2C	200-750 (93-399)	.89-.82	On Al Foil, 2 coats	250 (121)	.51	Silicon Carbide	300-1200 (149-649)	.83-.96
Coating No. C20A	200-750 (93-399)	.73-.67	On Polished Iron, .001 Film	100 (38)	.22	Silk Cloth	68 (20)	.78
Porcelain	72 (22)	.92	On Polished Iron, .002 Film	100 (38)	.45	Slate	100 (38)	.67-.80
White Al ₂ O ₃	200 (93)	.90	On Polished Iron, .004 Film	100 (38)	.65	Snow, Fine Particles	20 (-7)	.82
Zirconia on Inconel	800-2000 (427-1093)	.62-.45	On Polished Iron, Thick Film	100 (38)	.83	Snow, Granular	18 (-8)	.89
Clay	68 (20)	.39	Paints			Soil		
" Fired	158 (70)	.91	Blue, Cu ₂ O ₃	75 (24)	.94	Surface	100 (38)	.38
" Shale	68 (20)	.69	Black, CuO	75 (24)	.96	Black Loam	68 (20)	.66
" Tiles, Light Red	2500-5000 (1371-2760)	.32-.34	Green, Cu ₂ O ₃	75 (24)	.92	Plowed Field	68 (20)	.38
" Tiles, Red	2500-5000 (1371-2760)	.40-.51	Red, Fe ₂ O ₃	75 (24)	.91	Soot		
" Tiles, Dark Purple	2500-5000 (1371-2760)	.78	White, Al ₂ O ₃	75 (24)	.94	Acetylene	75 (24)	.97
Concrete			White, Y ₂ O ₃	75 (24)	.90	Camphor	75 (24)	.94
Rough	32-2000 (0-1093)	.94	White, ZnO	75 (24)	.95	Candle	250 (121)	.95
Tiles, Natural	2500-5000 (1371-2760)	.63-.62	White, MgCO ₃	75 (24)	.91	Coal	68 (20)	.95
" Brown	2500-5000 (1371-2760)	.87-.83	White, ZrO ₂	75 (24)	.95	Stonework	100 (38)	.93
" Black	2500-5000 (1371-2760)	.94-.91	White, ThO ₂	75 (24)	.90	Water	100 (38)	.67
Cotton Cloth	68 (20)	.77	White, MgO	75 (24)	.91	Waterglass	68 (20)	.96
Dolomite Lime	68 (20)	.41	White, PbCO ₃	75 (24)	.93	Wood	Low	.80-.90
Emery Corundum	176 (80)	.86	Yellow, PbO	75 (24)	.90	Beech Planed	158 (70)	.94
Glass			Yellow, PbCrO ₄	75 (24)	.93	Oak, Planed	100 (38)	.91
Convex D	212 (100)	.80	Paints, Aluminium	100 (38)	.27-.67	Spruce, Sanded	100 (38)	.89
Convex D	600 (316)	.80	10% Al	100 (38)	.52			
Convex D	932 (500)	.76	26% Al	100 (38)	.30			
Nonex	212 (100)	.82	Dow XP-310	200 (93)	.22			
Nonex	600 (316)	.82	Paints, Bronze	Low	.34-.80			
Nonex	932 (500)	.78	Gum Varnish (2 coats)	70 (21)	.53			
Smooth	32-200 (0-93)	.92-.94	Gum Varnish (3 coats)	70 (21)	.50			
			Cellulose Binder (2 coats)	70 (21)	.34			