American Petroleum Institute (API) Information

API Gravity Scale

Degree API	Specific Gravity	Weight		Oil will initially…	Viscosity
		(lb/US gal)	(kg/m^3)		
8	1.014	8.448	1012	SINK	High
9	1.007	8.388	1005		
10	1.000	8.328	998	NEUTRAL	
15	0.966	8.004	964	FLOAT	
20	0.934	7.778	932		
25	0.094	7.529	902		
30	0.876	7.296	874		
35	0.850	7.076	848		
40	0.825	6.870	823		
45	0.802	6.675	800		
50	0.780	6.490	778		
55	0.759	6.316	757		
58	0.747	6.216	745		Low

^{0}API = (141.5/Specific Gravity of Oil at 60^{0}F) – 131.5

Specific Gravity = 141.5/(^{0}API + 131.5)

Sheen / Volume calculations

Description	Layer Thickness		Concentration			Skimmable Oil?
	microns (µm)	inches (in.)	m^3 per km^2	bbl/acre	gal/ft^2	
Sliver/Gray Sheen	0.04 – 0.30	$1.6x10^{-6}$ – $1.2x10^{-5}$	0.04 – 0.30	$1.0x10^{-3}$ – $7.8x10^{-3}$	$9.6x10^{-7}$ – $7.5x10^{-6}$	NO
Rainbow	0.30 – 5.0	$1.2x10^{-5}$ – $2.0x10^{-4}$	0.30 – 5.0	$7.8x10^{-3}$ – $1.28x10^{-1}$	$7.5x10^{-6}$ – $1.23x10^{-4}$	NO
Metallic	5.0 – 50	$2.0x10^{-4}$ – $2.0x10^{-3}$	5.0 – 50	$1.28x10^{-1}$ – 1.28	$1.23x10^{-4}$ – $1.23x10^{-3}$	NO
Transitional	50 – 200	$2.0x10^{-3}$ – $8.0x10^{-3}$	50 – 200	1.28 – 5.1	$1.23x10^{-3}$ – $4.91x10^{-3}$	YES
Dark	> 200	> $8.0x10^{-3}$	> 200	> 5.1	> $4.91x10^{-3}$	YES

1 acre = 43,560 ft^2

1 bbl = 42 Imperial (US) gallons

1 ounce = 0.0078 gallon or $7.8x10^{-3}$ gallon

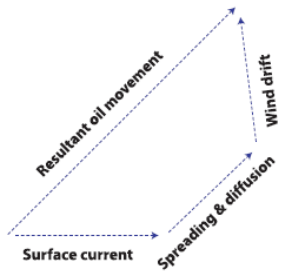
1 teaspoon = 0.0013 gallon or $1.3x10^{-3}$ gallon

API Oil Classifications (By Type)

Factors/Group	Group 1	Group 2	Group 3	Group 4	Group 5
Spec Gravity	< 0.80	0.80 – 0.85	0.85 – 0.95	0.95 – 1.00	> 1.0
^{0} API	> 45	35 – 45	17.5 – 35	10 – 17.5	< 10
Flammability	High	Moderate	Moderate	Moderate – Low	Low
Volatility	High	Moderate	Moderate	Low	Low
Evaporation rate	High	Moderate	Moderate	Low	Low
Residue	No	Refined = No Crude = Yes	Yes	Yes Sticky	Yes Very Sticky
Viscosity	Low	Low	Moderate - High	High	Very High
Penetrate substrates	Yes	Yes	Variable	Little	None
Examples	Gasoline products	Diesel fuel #1 and #2 oil Jet fuel Kerosene West Texas Crude	Intermediate Fuel Oil (IFO) 180 Lube oils Arabian Light Crude Bonny Light Crude	Venezuela Crude Mexican Crude #6 oil IFO 360 Bunker oils	Residual oils Asphalt products Very Heavy Crude Oils Power Plant Fuels

Boom Information

Time to Drift 100 Feet (seconds)	Velocity (ft/sec)	Velocity (m/sec)	Velocity (knots)	Max Boom Deflection Angle (degrees)	Boom Required for 100-foot Profile to Current (feet)	Anchors if Placed Every 50 feet (number)
6	16.7	5.1	10.00	4.0	1,429	30
8	12.5	3.8	7.50	5.4	1,071	22
10	10.0	3.1	6.00	6.7	857	18
12	8.3	2.5	5.00	8.0	714	15
14	7.1	2.2	4.29	9.4	612	13
17	5.9	1.8	3.53	11.4	504	11
20	5.0	1.5	3.00	13.5	429	10
24	4.2	1.3	2.50	16.3	357	8
30	3.3	1.0	2.00	20.5	286	7
40	2.5	0.8	1.50	27.8	214	5
60	1.7	0.5	1.00	44.4	143	4
>86	≤1.2	≤0.35	≤0.70	90.0	100	3



- The escape velocity of oil under a boom is approximately 0.7 knots.
- Oil velocity = surface current velocity + 3% of wind velocity
- The greater the current velocity, the greater the need to angle the boom and to add additional anchor points.