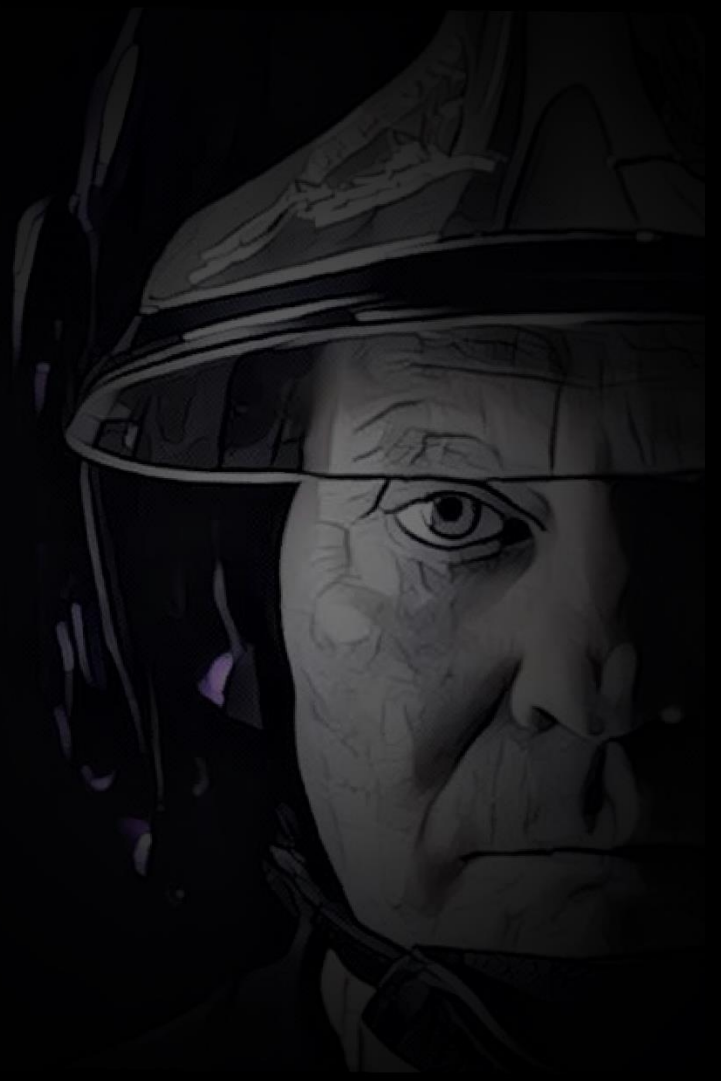
Firefighting water and flow-rate demands on your first hose-line in

Room fire	>200 L/min (HP)
Apartment fire	>350 - 600 L/min
Open-plan office floor	>750 L/min
Industrial or Storage	>750 - 1000 L/min

Never under estimate your needed flow-rate, and if your second hose-line is more than sixty seconds away from the fire, then deploy the next higher flow-rate on the chart first.



‘Put the wet stuff on the hot stuff’

‘Big fire – Big water’

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100 Wood Pallets

35 m^2 open-plan apartment

27,200 MJ Fire Load (Each pallet provides 272 MJ)

This is an 18 MW external fire!

35 m^2 open-plan apartment 780 MJ/m^2

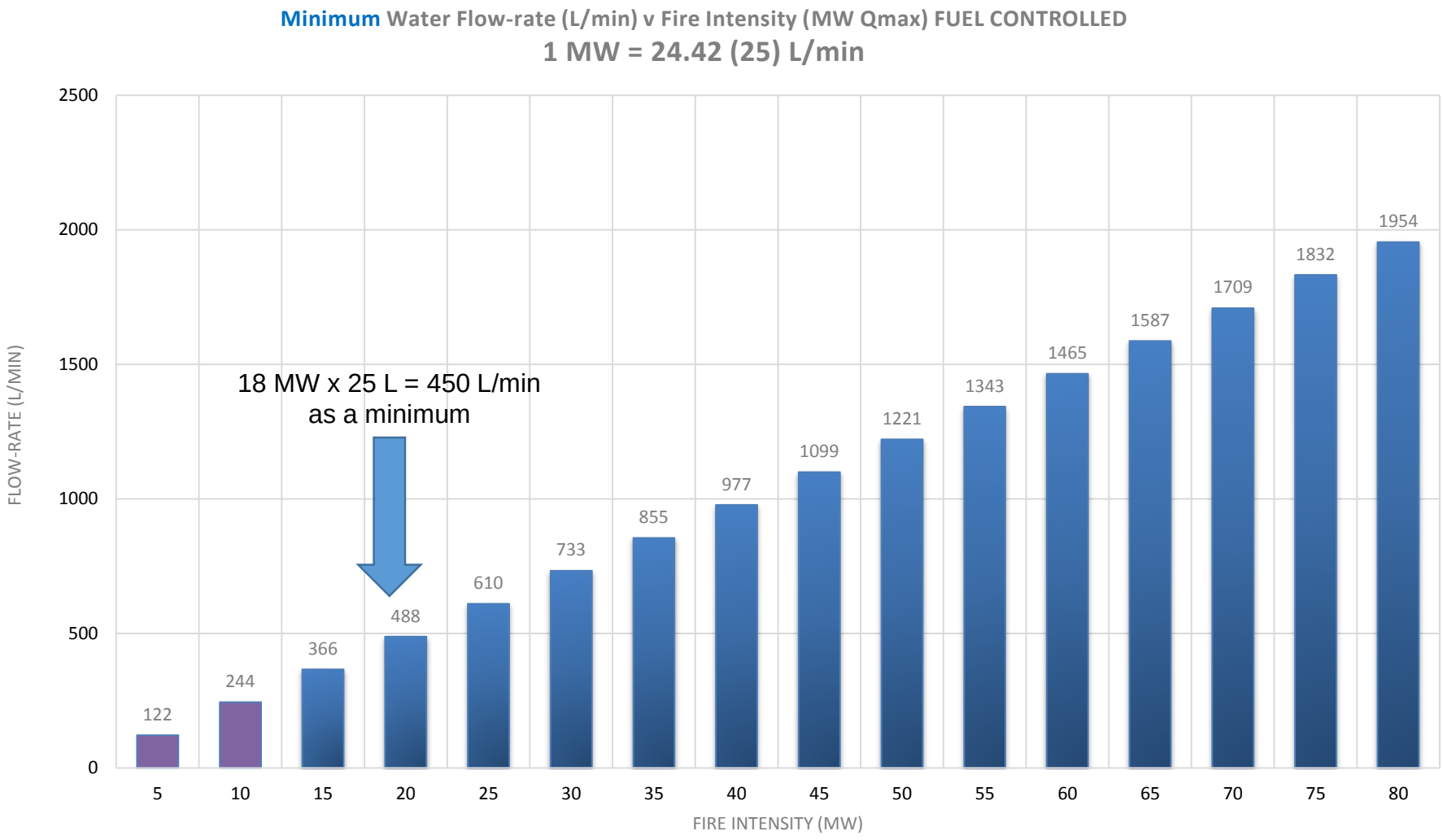
27,200 MJ / 1500 s = 18 MJ/s

This is an 18 MW external fire!

Table A.5 — *Fire load density for different occupancies*

Occupancy	Distribution type	Mean Q_{fd}^{*} (MJ/m^2)
Dwelling	Gumbel type I	780
Hospital		230
Hotel room		310
Library		1 500
Office		420
School		285
Fast food outlet	Log-normal	526
Clothing store		393
Restaurant		298
Kitchen		314
Retail unit storage area		1 196
Manufacturing and storage of combustible goods (<150 kg/m^2)		1 180
Manufacturing and storage of combustible goods (>150 kg/m^2)		9 920

Estimating water needs v Qmax ensures safety for an 18 MW fire load that may become 13 MW when enclosed



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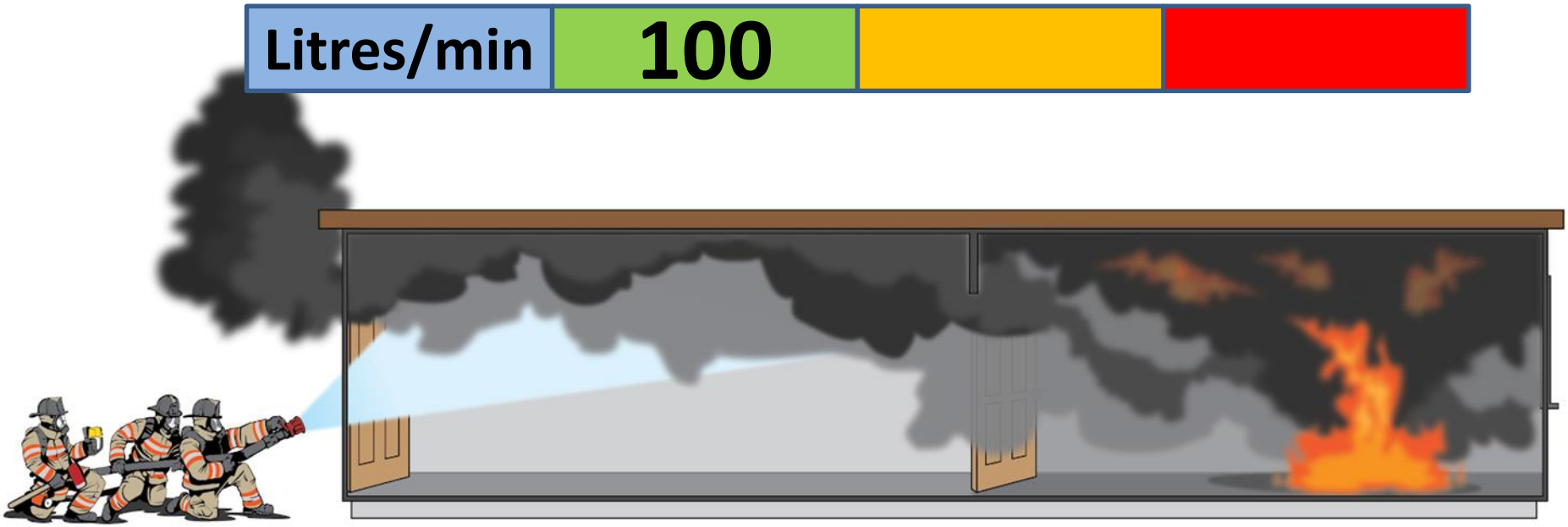
Gas Cooling



Graphic courtesy of Ottawa Fire Services

***Gas cooling** requires low-flows but very small droplets, generally at high-pressures, that hang in the air to extract heat most effectively.*

13 MW
ENCLOSED FIRE

Flame Cooling

Graphic courtesy of Ottawa Fire Services

Flame cooling *requires low to mid-range flows but larger droplets, that are able to penetrate the overhead flame-front and extract heat most effectively.*

13 MW

ENCLOSED FIRE

Direct Fire Attack

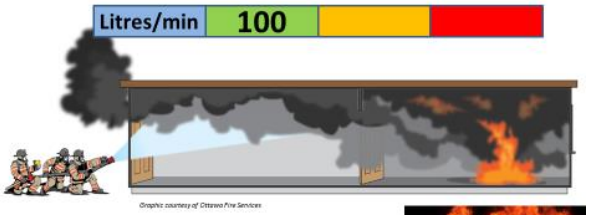
Graphic courtesy of Ottawa Fire Services

***Direct attack** requires high-flows aimed at the base of the fire, to penetrate the fuel-base and extract heat most effectively.*

13 MW

ENCLOSED FIRE

Gas Cooling



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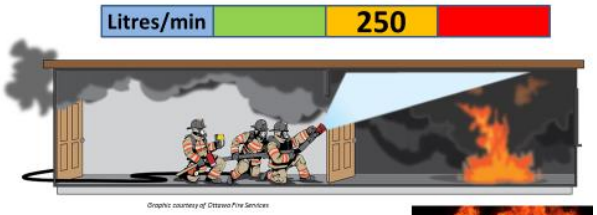
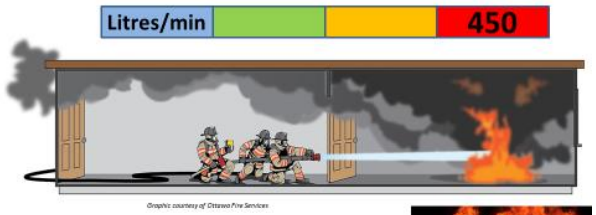
Flame Cooling



***Flame cooling** requires low to mid-range flows but larger droplets, that are able to penetrate the flame-front and extract heat most effectively.*

Direct Fire Attack



***Direct attack** requires high-flows aimed at the base of the fire, to penetrate the fuel-base and extract heat most effectively.*

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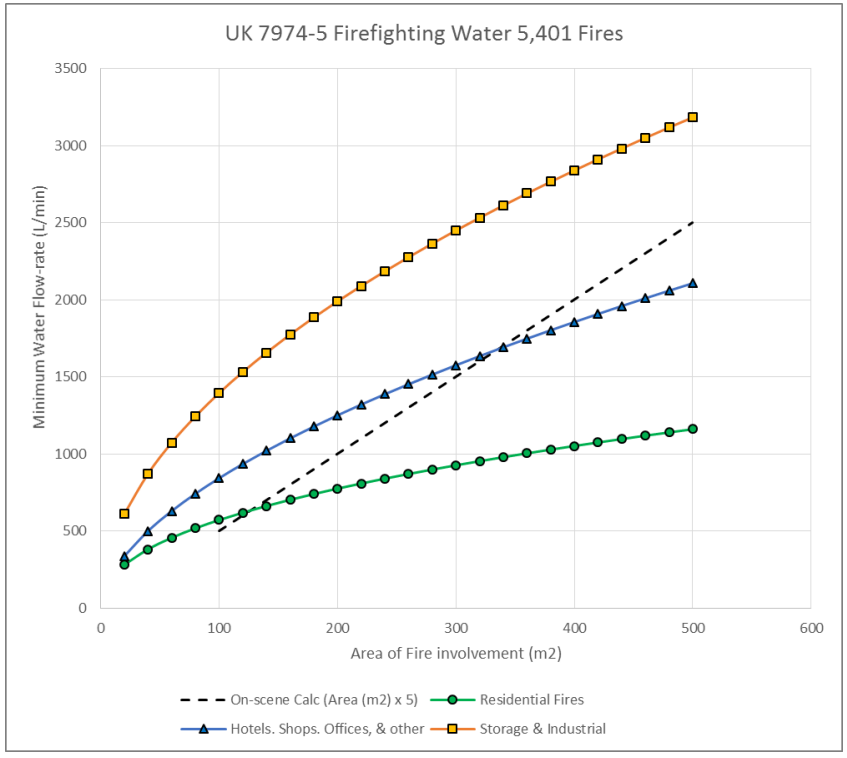
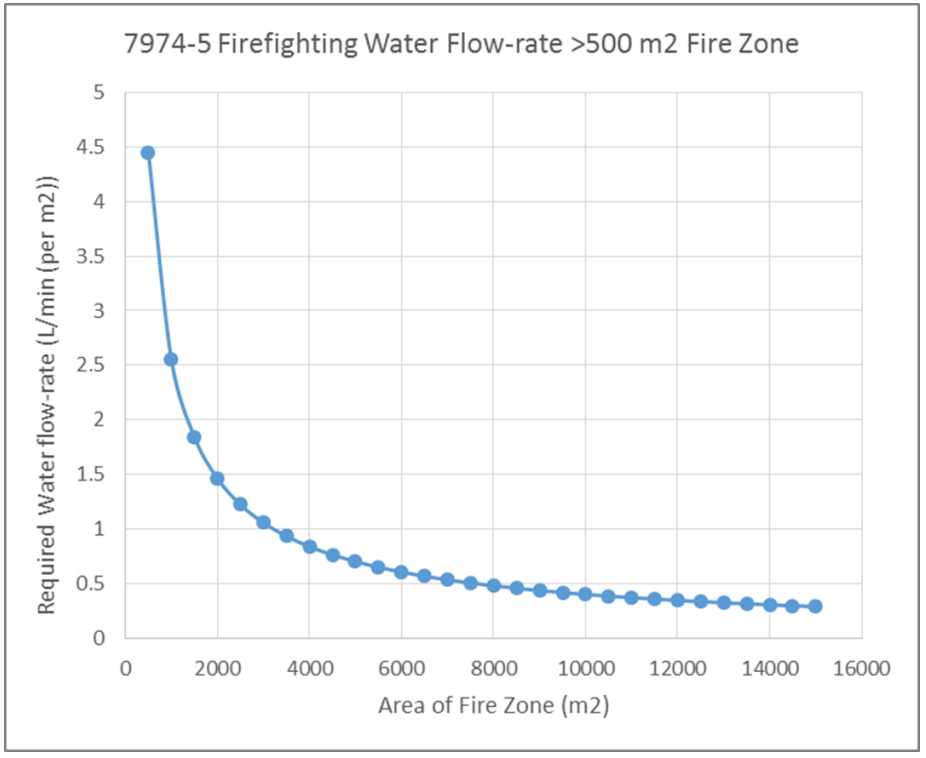
Fire graphics courtesy of Ottawa Fire Services





Up to 150m^2 of horizontal fire a firefighter can expect the *flashover* phenomenon as a worst case fire spread scenario. Beyond 150m^2 a *'travelling fire'* can be expected.

The tactics are far more demanding and the first hose-line deployed must flow a *minimum* of 750 L/min within 8 minutes of arrival.