Typical fire sizes adopted in various countries

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A Canadian paper published in 2016 had found the following data:

Fire data for typical vehicles

Vehicles	PHRR (MW)
Passenger car	5–10
Multiple passenger cars (2–4 vehicles)	10–20
Bus	20–30
Heavy goods truck	70–200
Tanker	200–300

Source: Ahmed Kashef, National Research Council of Canada, Ottawa, Canada.

Article “Ventilation Strategies – an Integral Part of Fire Protection Systems in Modern Tunnels” in the Proceedings Report of the “Seventh International Symposium on Tunnel Safety and Security, Montreal, Canada, March 16-18, 2016”

Typical fire sizes adopted in various countries

WITT&SOHN IGW Ventilatoren

A Canadian paper published in 2016 had found the following data:

Fire sizes adopted in different countries

Country	PHRR (MW)	Notes
Australia	50	With FFFS (deluge system), for ventilation only
Austria	30	High risk category: 50 MW
France	30 – 200	200 MW when transport of dangerous goods allowed but only applied for longitudinal ventilation
Germany	30 – 100	Depending on length and HGV in tunnel
Greece	100	Longitudinal ventilation
Italy	20 – 200	
Japan	30	
Netherlands	100-200	100 MW if tankers are not allowed, otherwise 200 MW for ventilation system
Norway	20 – 100	Depending on risk class, always longitudinal ventilation
Portugal	10-100	Based on traffic type
Russia	50-100	
Singapore	30-200	Depends on vehicle types allowed
Spain	>Or =30	
Sweden	100	Longitudinal ventilation
Switzerland	30	Smoke extraction equals 3.3-4 m/s times cross section
UK	30 – 100	
USA	30 – 300	300 MW if dangerous goods allowed

Source: Ahmed Kashef, National Research Council of Canada, Ottawa, Canada.

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The same paper gave an order of magnitude for the smoke characteristics for a fire tunnel (i.e. a different geometry will give different results, however as can be seen, the fire size is the deterring factor.)

Smoke layer characteristics in a hypotheticall tunnel

Fire Size (MW)	3	10	20	50	100
$\dot{m}_s$ (kg/s)	17	24	35	48	95
u_{so} (m/s)	1.3	2.2	3.0	5.3	6.7
d_{so} (m)	0.7	0.9	1.2	1.7	2.7

Legend:
m_s = smoke production rate, kg/s
u_{so} = initial smoke layer moving velocity, m/s
d_{so} = initial smoke layer thickness, m

In order to around back layering the minimum smoke velocity should be higher than the initial smoke layer velocity.

Source: Ahmed Kashef, National Research Council of Canada, Ottawa, Canada.
Article “Ventilation Strategies – an Integral Part of Fire Protection Systems in Modern Tunnels” in the Proceedings Report of the “Seventh International Symposium on Tunnel Safety and Security, Montreal, Canada, March 16-18, 2016”