

```

&HEAD CHID='Arup_Tunnel', TITLE='Arup tunnel fire experiment' /

&TIME T_END=500. /

&MESH IJK=120,45,35, XB=-10.,14.,-0.20,8.80,0.0,7.0, MULT_ID='mesh' /
&MULT ID='mesh', DX=24., I_UPPER=4 /

&PRES VELOCITY_TOLERANCE=0.02 /

Fire

&REAC FUEL='N-HEPTANE',
      SOOT_YIELD=0.015 /

&SURF ID='Steel pool',
      COLOR='GRAY 40',
      MATL_ID='STEEL',
      THICKNESS(1)=0.012 /

&SURF ID='Burner',
      COLOR='RED',
      TMP_FRONT=500.,
      HRRPUA=2672.,
      RAMP_Q='Burner_RAMP_Q' /

&RAMP ID='Burner_RAMP_Q', T=0.00, F=0.00/
&RAMP ID='Burner_RAMP_Q', T=10.0, F=0.70/
&RAMP ID='Burner_RAMP_Q', T=20.0, F=0.82/
&RAMP ID='Burner_RAMP_Q', T=50.0, F=0.83/
&RAMP ID='Burner_RAMP_Q', T=70.0, F=0.85/
&RAMP ID='Burner_RAMP_Q', T=90.0, F=0.83/
&RAMP ID='Burner_RAMP_Q', T=100.0, F=0.86/
&RAMP ID='Burner_RAMP_Q', T=110.0, F=0.89/
&RAMP ID='Burner_RAMP_Q', T=140.0, F=0.87/
&RAMP ID='Burner_RAMP_Q', T=150.0, F=0.88/
&RAMP ID='Burner_RAMP_Q', T=160.0, F=0.88/
&RAMP ID='Burner_RAMP_Q', T=170.0, F=0.93/
&RAMP ID='Burner_RAMP_Q', T=190.0, F=0.95/
&RAMP ID='Burner_RAMP_Q', T=200.0, F=0.97/
&RAMP ID='Burner_RAMP_Q', T=220.0, F=0.94/
&RAMP ID='Burner_RAMP_Q', T=240.0, F=0.97/
&RAMP ID='Burner_RAMP_Q', T=250.0, F=0.95/
&RAMP ID='Burner_RAMP_Q', T=260.0, F=0.91/
&RAMP ID='Burner_RAMP_Q', T=270.0, F=0.88/
&RAMP ID='Burner_RAMP_Q', T=280.0, F=0.86/
&RAMP ID='Burner_RAMP_Q', T=290.0, F=0.80/
&RAMP ID='Burner_RAMP_Q', T=300.0, F=0.58/
&RAMP ID='Burner_RAMP_Q', T=310.0, F=0.10/
&RAMP ID='Burner_RAMP_Q', T=311.0, F=0.00/
&RAMP ID='Burner_RAMP_Q', T=500.0, F=0.00/

&OBST XB=49.00,51.00,3.80,4.80,0.00,0.40, SURF_IDS='Burner','Steel pool','Steel pool' /

```

Output

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&DUMP DT_HRR=10., DT_DEVC=10., SIG_FIGS=4, SIG_FIGS_EXP=2 /

&PROP ID='Big TC', BEAD_DIAMETER=0.003 /

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&DEVC ID='Tf01', QUANTITY='THERMOCOUPLE', XYZ=50.00,4.30,2.00, PROP_ID='Big TC' /
&DEVC ID='Tf02', QUANTITY='THERMOCOUPLE', XYZ=50.00,4.30,3.00, PROP_ID='Big TC' /
&DEVC ID='Tf03', QUANTITY='THERMOCOUPLE', XYZ=50.00,4.30,4.00, PROP_ID='Big TC' /
&DEVC ID='Tf04', QUANTITY='THERMOCOUPLE', XYZ=50.00,4.30,5.00, PROP_ID='Big TC' /
&DEVC ID='Tl01', QUANTITY='THERMOCOUPLE', XYZ=42.00,4.30,6.50, PROP_ID='Big TC' /
&DEVC ID='Tl02', QUANTITY='THERMOCOUPLE', XYZ=44.00,4.30,6.50, PROP_ID='Big TC' /
&DEVC ID='Tl03', QUANTITY='THERMOCOUPLE', XYZ=46.00,4.30,6.50, PROP_ID='Big TC' /
&DEVC ID='Tl04', QUANTITY='THERMOCOUPLE', XYZ=48.00,4.30,6.50, PROP_ID='Big TC' /
&DEVC ID='Tl05', QUANTITY='THERMOCOUPLE', XYZ=50.00,4.30,6.50, PROP_ID='Big TC' /
&DEVC ID='Tl06', QUANTITY='THERMOCOUPLE', XYZ=52.00,4.30,6.50, PROP_ID='Big TC' /
&DEVC ID='Tl07', QUANTITY='THERMOCOUPLE', XYZ=54.00,4.30,6.50, PROP_ID='Big TC' /
&DEVC ID='Tl08', QUANTITY='THERMOCOUPLE', XYZ=56.00,4.30,6.50, PROP_ID='Big TC' /
&DEVC ID='Tl09', QUANTITY='THERMOCOUPLE', XYZ=58.00,4.30,6.50, PROP_ID='Big TC' /
&DEVC ID='Tp01', QUANTITY='WALL TEMPERATURE', XYZ=45.00,4.30,2.50, IOR=1/
&DEVC ID='Tp10', QUANTITY='WALL TEMPERATURE', XYZ=45.00,4.30,4.00, IOR=-3/
&DEVC ID='Tp02', QUANTITY='WALL TEMPERATURE', XYZ=45.00,4.30,3.50, IOR=1/
&DEVC ID='Tp09', QUANTITY='WALL TEMPERATURE', XYZ=55.00,4.30,4.00, IOR=-3/
&DEVC ID='Tp05', QUANTITY='WALL TEMPERATURE', XYZ=50.00,8.30,2.50, IOR=-2/
&DEVC ID='Tp04', QUANTITY='WALL TEMPERATURE', XYZ=50.00,0.30,3.50, IOR=2/
&DEVC ID='Tp06', QUANTITY='WALL TEMPERATURE', XYZ=50.00,8.30,3.50, IOR=-2/
&DEVC ID='Tp08', QUANTITY='WALL TEMPERATURE', XYZ=55.00,4.30,3.50, IOR=-1/
&DEVC ID='Tp07', QUANTITY='WALL TEMPERATURE', XYZ=55.00,4.30,2.50, IOR=-1/
&DEVC ID='Tp03', QUANTITY='WALL TEMPERATURE', XYZ=50.00,0.30,2.50, IOR=2/

```

Tunnel Construction

```

&MATL ID='CONCRETE',
SPECIFIC_HEAT=0.88,
CONDUCTIVITY=1.00,
DENSITY=2100. /

```

```

&SURF ID='CONCRETE',
COLOR='GRAY 50'
DEFAULT=.TRUE.
TRANSPARENCY=0.60
MATL_ID='CONCRETE',
THICKNESS(1)=2.0 /

```

```

&OBST XB=0.00,100.00,0.80,1.00,5.00,5.40, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,7.20,7.40,5.40,5.80, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,7.80,8.00,4.60,5.20, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,3.00,3.20,6.60,6.80, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,1.80,2.00,6.00,6.20, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,8.20,8.40,3.80,4.60, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,2.00,2.20,6.00,6.40, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,7.00,7.20,5.60,6.00, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,1.60,1.80,5.80,6.20, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,4.20,5.40,6.60,6.80, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,5.60,6.00,6.40,6.80, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,1.40,1.60,5.60,6.00, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,2.20,2.40,6.20,6.40, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,7.60,7.80,5.00,5.40, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,0.60,0.80,4.60,5.20, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,8.00,8.20,4.40,4.80, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,0.00,0.20,0.00,3.80, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,1.00,1.20,5.20,5.60, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,3.20,4.20,6.60,6.80, SURF_ID='CONCRETE' /

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```

&OBST XB=0.00,100.00,6.40,6.60,6.00,6.40, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,6.00,6.20,6.20,6.60, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,6.20,6.40,6.20,6.40, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,8.40,8.60,0.00,4.00, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,1.20,1.40,5.40,5.80, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,5.40,5.60,6.60,6.80, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,0.40,0.60,4.20,4.80, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,8.00,8.20,4.20,4.60, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,6.80,7.00,5.80,6.20, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,0.20,0.40,3.60,4.40, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,2.40,2.60,6.20,6.60, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,2.60,3.00,6.40,6.80, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,6.60,6.80,6.00,6.20, SURF_ID='CONCRETE' /
&OBST XB=0.00,100.00,7.40,7.60,5.20,5.60, SURF_ID='CONCRETE' /

```

```

&VENT SURF_ID='OPEN', PBX=-10. /
&VENT SURF_ID='OPEN', PBX=110. /
&VENT SURF_ID='OPEN', MB='YMIN' /
&VENT SURF_ID='OPEN', MB='YMAX' /
&VENT SURF_ID='OPEN', MB='ZMAX' /

```

Plate Thermometers

```

&SURF ID='Plate Front'
MATL_ID='STEEL','INSULATION'
BACKING='EXPOSED'
THICKNESS=0.0007,0.01
COLOR='BLACK' /

```

```

&SURF ID='Plate Back'
MATL_ID='INSULATION','STEEL'
BACKING='EXPOSED'
THICKNESS=0.01,0.0007
COLOR='PINK' /

```

```

&MATL ID='INSULATION',
FYI='Isolatek BLAZE-SHIELD DC/F - WTC FDS5 Validation',
SPECIFIC_HEAT_RAMP='INSULATION_SPECIFIC_HEAT_RAMP',
CONDUCTIVITY_RAMP='INSULATION_CONDUCTIVITY_RAMP',
DENSITY=208. /

```

```

&RAMP ID='INSULATION_CONDUCTIVITY_RAMP', T=20.00, F=0.0500/
&RAMP ID='INSULATION_CONDUCTIVITY_RAMP', T=377.00, F=0.1000/
&RAMP ID='INSULATION_CONDUCTIVITY_RAMP', T=677.00, F=0.2000/
&RAMP ID='INSULATION_SPECIFIC_HEAT_RAMP', T=20.00, F=0.80/
&RAMP ID='INSULATION_SPECIFIC_HEAT_RAMP', T=677.00, F=2.00/

```

```

&MATL ID='STEEL',
SPECIFIC_HEAT=0.4600,
CONDUCTIVITY=45.80,
DENSITY=7850. /

```

```

&OBST XB=49.90,50.10,0.30,0.30,2.50,2.60, SURF_ID6='INERT','INERT','Plate Back','Plate Front'
,'INERT','INERT' /
&OBST XB=49.90,50.10,8.40,8.40,2.40,2.60, SURF_ID6='INERT','INERT','Plate Front','Plate Back'
,'INERT','INERT' /
&OBST XB=55.00,55.00,4.20,4.40,2.40,2.60, SURF_ID6='Plate Front','Plate Back','INERT','INERT'
,'INERT','INERT' /

```

```
&OBST XB=45.00,45.00,4.20,4.40,2.40,2.60, SURF_ID6='Plate Back','Plate Front','INERT','INERT',  
'INERT','INERT' /  
&OBST XB=49.90,50.10,0.30,0.30,3.40,3.60, SURF_ID6='INERT','INERT','Plate Back','Plate Front',  
'INERT','INERT' /  
&OBST XB=49.90,50.10,8.40,8.40,3.40,3.60, SURF_ID6='INERT','INERT','Plate Front','Plate Back',  
'INERT','INERT' /  
&OBST XB=55.00,55.00,4.20,4.40,3.40,3.60, SURF_ID6='Plate Front','Plate Back','INERT','INERT',  
'INERT','INERT' /  
&OBST XB=45.00,45.00,4.20,4.40,3.40,3.60, SURF_ID6='Plate Back','Plate Front','INERT','INERT',  
'INERT','INERT' /  
&OBST XB=44.90,45.10,4.20,4.40,4.00,4.00, SURF_ID6='INERT','INERT','INERT','INERT','Plate  
Back','Plate Front' /  
&OBST XB=54.90,55.10,4.20,4.40,4.00,4.00, SURF_ID6='INERT','INERT','INERT','INERT','Plate  
Back','Plate Front' /
```

Smokeview Output

```
&SLCF PBY=4.3, QUANTITY='TEMPERATURE', VECTOR=.TRUE. /
```

```
&TAIL /
```