WRIGHT-MIX

MATERIAL

Wright-Mix Materials Solutions® LLC

Wright-Mix – Aerated Limestone Rock Dust

- Meets 30 C.F.R. part 75.2
- Single component dry powder
- Generates oxygen when mixed with water
- Very clean MSDS
- Less than 2% silica
- Less than 2% combustible content
- Rapid dry
- Non caking
- Packaged to order – 40 lb paper bag to 3,000 lb super sacks
- Silo storage of bulk delivery
- 40 lb covers 125 sq ft at 0.25 inches thick

Trial size pump – Mixes ALRD with only water

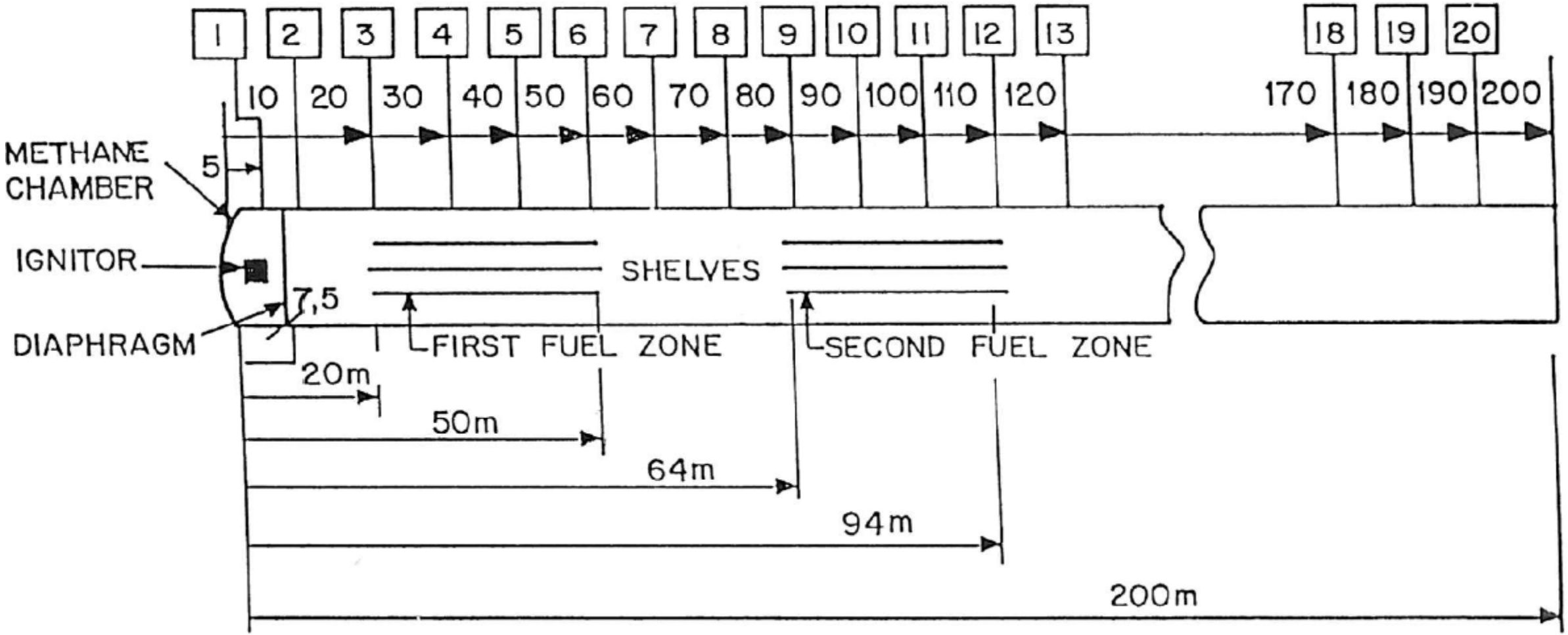
Full-scale Testing Demonstrates That a New Mixture Performs as Well as Rock Dust

CSIR Explosion Research Facility Kloppersbos, South Africa

- 200 meter long
- 2.5 meter diameter
- 36 cubic meter methane chamber
- Polyethene sealed 7.5 meters from closed end
- Instrumented every 10 meters to monitor explosion life
- Coal dust fuel zones 20-50 and 64-94 meters from closed end

EXPLOSION GALLERY

INSTRUMENT STATIONS



Successful Wright Dust Test

Successful Traditional Rock Dust Test

No Rock Dust Fireball

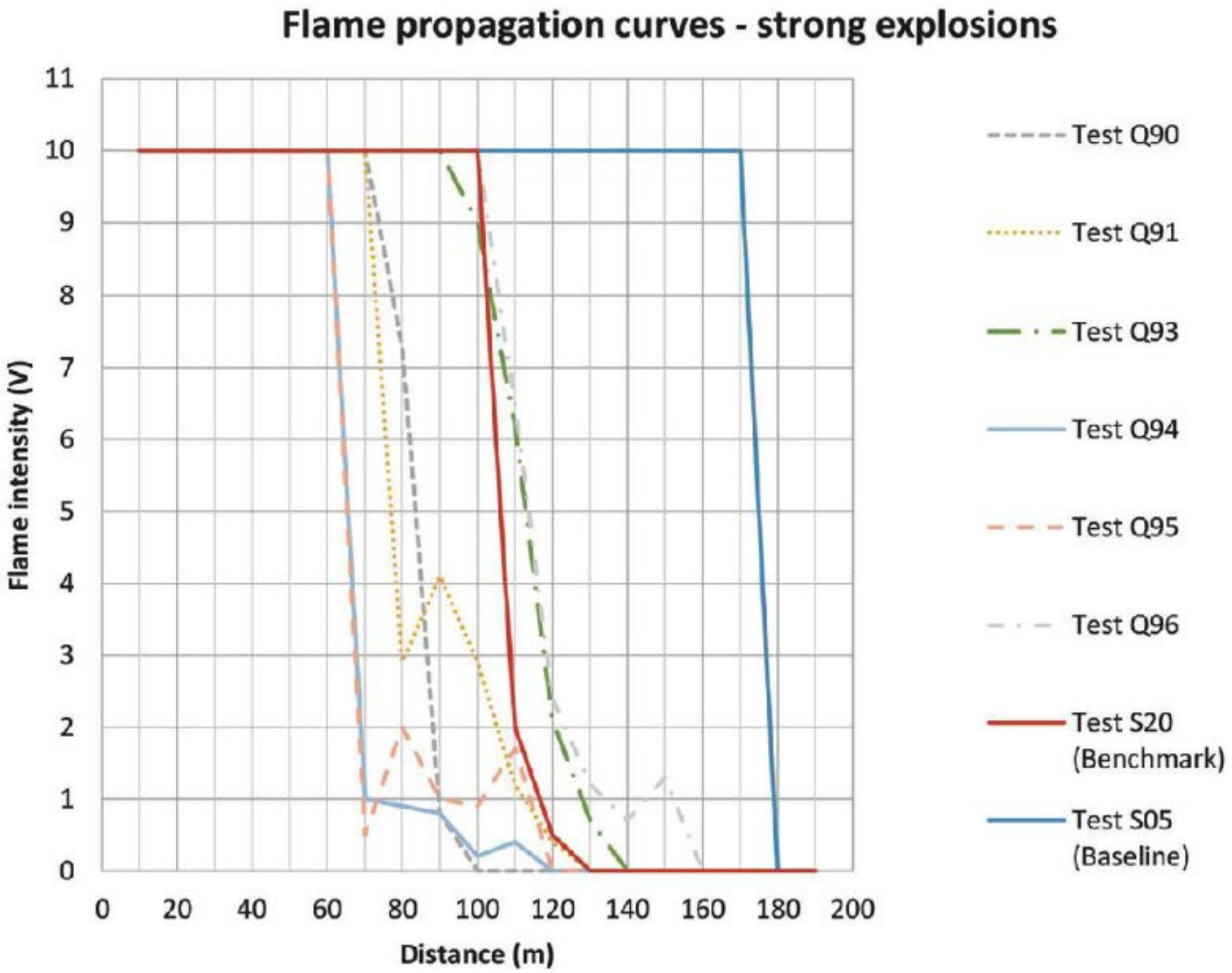
Explosion Test Types

- Weak – coal dust spread on floor of gallery
- Strong – coal dust on paper tissue lined trays on elevated racks
- Single – coal dust in fuel zone one only
- Double – coal dust in fuel zones one and two
- Definitions valid with or without inert material

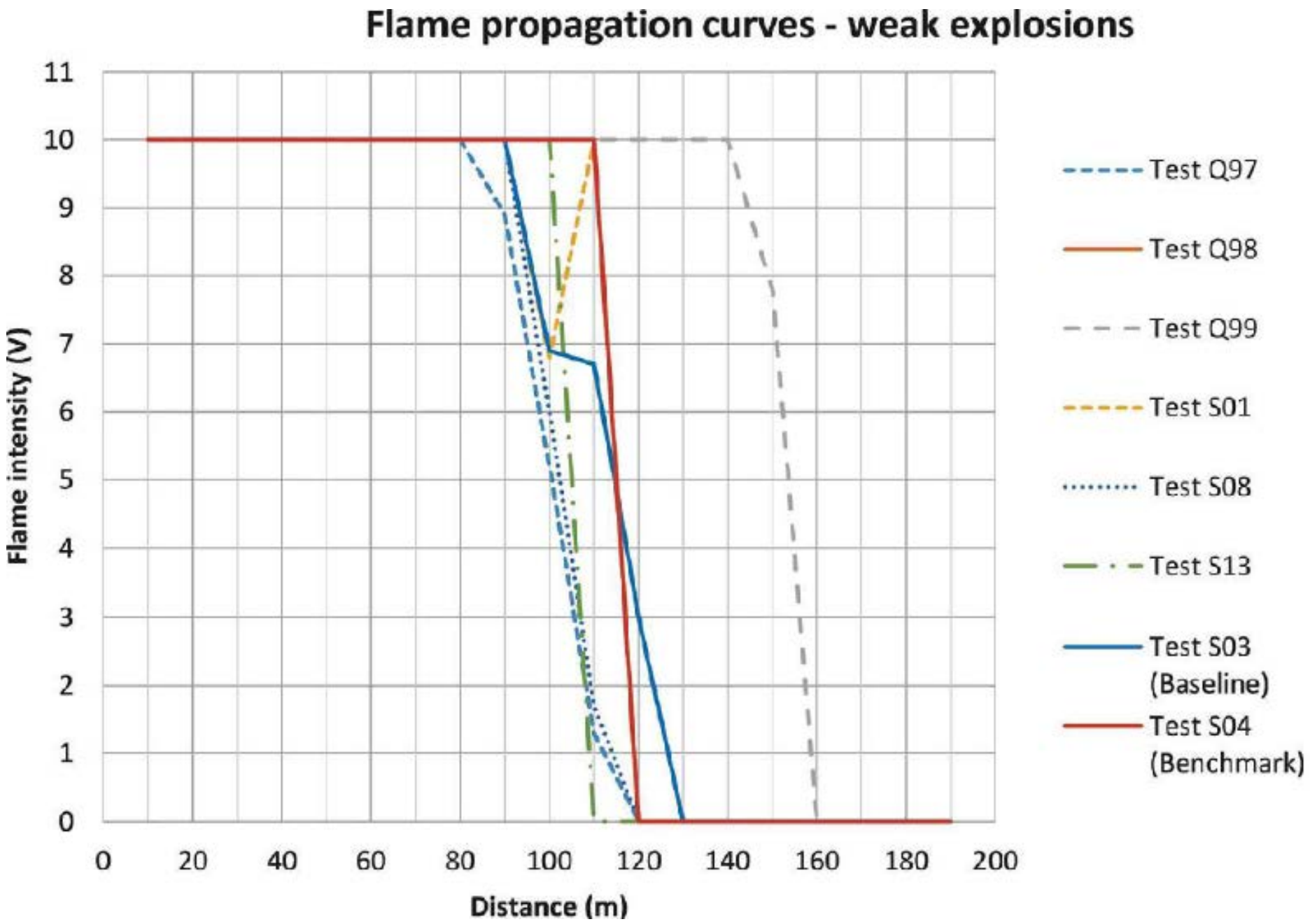
Test Results

- Single-strong
  - No inert material – 180 meter flame
  - Traditional coal dust – 120 meter flame
  - Wright dust – all tests successful with 117 meter average flame
- Single-weak
  - No inert material – 130 meter flame
  - Traditional coal dust – 120 meter flame
  - Wright dust – 5 of 6 tests successful with 118 meter average flame

Test No.	Description	Fuel zone 1	Fuel zone 2	Average peak static pressure (kPa)	Peak dynamic pressure (kPa)	Flame distance (m)
S20	Double strong, dry rock dust 80% TIC, benchmark	35 kg coal dust on the shelves	35 kg Coal dust and 110 kg dry rock dust	96	20	120
S05	Single strong, baseline	35 coal dust on the shelves	Nil	101	63	180
Q90	Double strong, WMM[1]	35 coal dust on the shelves	35 kg coal dust manually applied on the dry WMM product	112	33	90
Q91	Double strong, WMM	35 coal dust on the shelves	35 kg coal dust manually applied on the dry WMM product	96	35	120
Q93	Double strong, WMM	35 coal dust on the shelves	35 kg coal dust manually applied on the dry WMM product	92	43	130
Q94	Double strong, WMM	35 coal dust on the shelves	35 kg coal dust manually applied on the dry WMM product	93	55	80
Q95	Double strong, WMM	35 coal dust on the shelves	35 kg coal dust manually applied on the dry WMM product	107	25	120
Q96	Double strong, WMM	35 coal dust on the shelves	35 kg coal dust manually applied on the dry WMM product	88	34	160
	Average of double strong, WMM tests			98	38	117


Flame propagation curves - strong explosions
Flame intensity (V)
Distance (m)
0
1
2
3
4
5
6
7
8
9
10
11
0
20
40
60
80
100
120
140
160
180
200
Test Q90
Test Q91
Test Q93
Test Q94
Test Q95
Test Q96
Test S20 (Benchmark)
Test S05 (Baseline)

Test No.	Description	Fuel zone 1	Fuel zone 2	Average peak static pressure (kPa)	Peak dynamic pressure (kPa)	Flame distance (m)
S03	Single weak, baseline	35 kg coal dust on the floor	Nil	84	Damaged sensor cable	130
S04	Double weak, dry rock dust, 80% TIC, benchmark	35 kg Coal dust on the floor	35 kg coal dust manually applied on the dry WMM product on the floor	79	50	120
Q97	Double weak, WMM	35 kg Coal dust on the floor	35 kg coal dust manually applied on the dry WMM product on the floor	79	30	120
Q98	Double weak, WMM	35 kg Coal dust on the floor	35 kg coal dust manually applied on the dry WMM product on the floor	79	41	120
Q99	Double weak, WMM	35 kg Coal dust on the floor	35 kg coal dust manually applied on the dry WMM product on the floor	88	38	160
S01	Double weak, WMM	35 kg coal dust on the floor	35 kg coal dust manually applied on the dry WMM product on the floor	75	30	120
S08	Double weak, WMM	35 kg coal dust on the floor	35 kg coal dust manually applied on the dry WMM product on the floor	64	22	120
S13	Double weak, WMM	35 kg coal dust on the floor	35 kg coal dust manually applied on the dry WMM product on the floor	90	75	110
	Average of double weak, WMM tests			79	39	125


Flame propagation curves - weak explosions
Flame intensity (V)
Distance (m)
0
1
2
3
4
5
6
7
8
9
10
11
0
20
40
60
80
100
120
140
160
180
200
Test Q97
Test Q98
Test Q99
Test S01
Test S08
Test S13
Test S03 (Baseline)
Test S04 (Benchmark)

CSIR report concludes “The results show similar performance when comparing dry rock dust and Wright Mix Aerated product.”

Questions?