

**APROXIMACION AL ESTUDIO DEL RIESGO
DEL BLEVE Y SUS EFECTOS EN LOS
GENERADORES MARINOS DE VAPOR Y LOS
TANQUES DE CARGA DE LOS BUQUES LNG-
LPG. APLICACION COMPARATIVA DE LAS
NORMAS QUE LO REGULAN Y PREVIENEN.**

Autor: German de Melo Rodriguez
Director: Emilio Eguia López

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ANEXO 9

CALCULATION MODEL : VAPOUR CLOUD EXPLOSION----PROPANE

AMOUNT OF EXPLOSIVE MATERIAL = 33146 M³
 REACTIVITY = MEDIUM EXPLOSIVE
 TEMPERATURE = 20.0 C.

DISTANCE (M)	PEAK OVERPRESSURE		POS.PHASE DURATION	
	MIN. (Bar)	MAX. (Bar)	MIN. (S)	MAX. (S)
303	0.06115	0.15289	1.36	0.50
837	0.02214	0.05535	1.33	0.45
910	0.02036	0.05091	1.33	0.44
1784	0.01039	0.02597	1.32	0.41
3034	0.00611	0.01527	1.31	0.39
901	0.02057	0.05141	1.33	0.44
9102	0.00204	0.00509	1.29	0.36
13715	0.00135	0.00338	1.28	0.35

CALCULATION MODEL : VAPOUR CLOUD EXPLOSION----PROPANE

AMOUNT OF EXPLOSIVE MATERIAL = 45852 M³
 REACTIVITY = MEDIUM EXPLOSIVE
 TEMPERATURE = 20.0 C.

DISTANCE (M)	PEAK OVERPRESSURE		POS.PHASE DURATION	
	MIN. (Bar)	MAX. (Bar)	MIN. (S)	MAX. (S)
303	0.06814	0.17035	1.51	0.57
837	0.02467	0.06167	1.49	0.50
910	0.02269	0.05672	1.49	0.50
1784	0.01157	0.02893	1.47	0.46
3034	0.00681	0.01701	1.46	0.44
901	0.02292	0.05729	1.49	0.50
9102	0.00227	0.00567	1.44	0.40
13715	0.00151	0.00376	1.43	0.39

CALCULATION MODEL : VAPOUR CLOUD EXPLOSION----PROPANE

AMOUNT OF EXPLOSIVE MATERIAL = 276216 M³
 REACTIVITY = MEDIUM EXPLOSIVE
 TEMPERATURE = 20.0 C.

DISTANCE (M)	PEAK OVERPRESSURE		POS. PHASE DURATION	
	MIN. (Bar)	MAX. (Bar)	MIN. (S)	MAX. (S)
303 M GIVEN POINT IS IN THE VAPOUR CLOUD				
837	0.04488	0.11221	2.73	0.98
910	0.04128	0.10321	2.73	0.97
1784	0.02106	0.05265	2.70	0.90
3034	0.01238	0.03096	2.68	0.85
901	0.04170	0.10424	2.73	0.97
9102	0.00413	0.01032	2.63	0.76
13715	0.00274	0.00685	2.62	0.74

CALCULATION MODEL : VAPOUR CLOUD EXPLOSION----PROPANE

AMOUNT OF EXPLOSIVE MATERIAL = 386702 M³
 REACTIVITY = MEDIUM EXPLOSIVE
 TEMPERATURE = 20.0 C.

DISTANCE (M)	PEAK OVERPRESSURE		POS. PHASE DURATION	
	MIN. (Bar)	MAX. (Bar)	MIN. (S)	MAX. (S)
303 M GIVEN POINT IS IN THE VAPOUR CLOUD				
837	0.05021	0.12553	3.06	1.11
910	0.04618	0.11546	3.06	1.10
1784	0.02356	0.05889	3.03	1.02
3034	0.01385	0.03463	3.00	0.96
901	0.04664	0.11661	3.06	1.10
9102	0.00462	0.01154	2.95	0.86
13715	0.00306	0.00766	2.93	0.83

CALCULATION MODEL : VAPOUR CLOUD EXPLOSION----PROPENE

AMOUNT OF EXPLOSIVE MATERIAL = 289311 M³
 REACTIVITY = MEDIUM EXPLOSIVE
 TEMPERATURE = 20.0 C.

DISTANCE (M)	PEAK OVERPRESSURE		POS.PHASE DURATION	
	MIN.(Bar)	MAX.(Bar)	MIN.(S)	MAX.(S)
303 M GIVEN POINT IS IN THE VAPOUR CLOUD				
837	0.04442	0.11106	2.71	0.97
910	0.04086	0.10215	2.70	0.96
1784	0.02084	0.05210	2.67	0.89
3034	0.01226	0.03064	2.65	0.84
901	0.04127	0.10317	2.70	0.96
9102	0.00409	0.01021	2.61	0.75
13715	0.00271	0.00678	2.59	0.73

CALCULATION MODEL : VAPOUR CLOUD EXPLOSION----PROPENE

AMOUNT OF EXPLOSIVE MATERIAL = 405036 M³
 REACTIVITY = MEDIUM EXPLOSIVE
 TEMPERATURE = 20.0 C.

DISTANCE (M)	PEAK OVERPRESSURE		POS.PHASE DURATION	
	MIN.(Bar)	MAX.(Bar)	MIN.(S)	MAX.(S)
303 M GIVEN POINT IS IN THE VAPOUR CLOUD				
837	0.04970	0.12424	3.03	1.10
910	0.04571	0.11427	3.03	1.09
1784	0.02332	0.05829	2.99	1.01
3034	0.01371	0.03427	2.97	0.95
901	0.04617	0.11541	3.03	1.09
9102	0.00457	0.01142	2.92	0.85
13715	0.00303	0.00758	2.90	0.82

CALCULATION MODEL : VAPOUR CLOUD EXPLOSION----PROPENE

AMOUNT OF EXPLOSIVE MATERIAL = 48026 M³
 REACTIVITY = MEDIUM EXPLOSIVE
 TEMPERATURE = 20.0 C.

DISTANCE (M)	PEAK OVERPRESSURE		POS. PHASE DURATION	
	MIN. (Bar)	MAX. (Bar)	MIN. (S)	MAX. (S)
303	0.06744	0.16860	1.50	0.56
837	0.02441	0.06104	1.47	0.50
910	0.02246	0.05614	1.47	0.49
1784	0.01145	0.02864	1.45	0.46
3034	0.00674	0.01684	1.44	0.43
901	0.02268	0.05670	1.47	0.49
9102	0.00225	0.00561	1.42	0.40
13715	0.00149	0.00372	1.42	0.39

CALCULATION MODEL : VAPOUR CLOUD EXPLOSION----PROPENE

AMOUNT OF EXPLOSIVE MATERIAL = 34717 M³
 REACTIVITY = MEDIUM EXPLOSIVE
 TEMPERATURE = 20.0 C.

DISTANCE (M)	PEAK OVERPRESSURE		POS. PHASE DURATION	
	MIN. (Bar)	MAX. (Bar)	MIN. (S)	MAX. (S)
303	0.06053	0.15132	1.34	0.50
837	0.02191	0.05478	1.32	0.44
910	0.02015	0.05038	1.32	0.44
1784	0.01028	0.02570	1.30	0.41
3034	0.00604	0.01511	1.29	0.38
901	0.02035	0.05089	1.32	0.44
9102	0.00201	0.00504	1.27	0.35
13715	0.00134	0.00334	1.27	0.35

CALCULATION MODEL : VAPOUR CLOUD EXPLOSION----METHANE

AMOUNT OF EXPLOSIVE MATERIAL = 5314473 M³
 REACTIVITY = LOW EXPLOSIVE
 TEMPERATURE = 20.0 C.

DISTANCE (M)	PEAK OVERPRESSURE		POS. PHASE DURATION	
	MIN. (Bar)	MAX. (Bar)	MIN. (S)	MAX. (S)
303 M GIVEN POINT IS IN THE VAPOUR CLOUD				
837	0.03034	0.09101	12.77	5.61
910	0.02790	0.08370	12.77	5.60
1784	0.01423	0.04270	12.75	5.54
3034	0.00837	0.02511	12.73	5.49
901	0.02818	0.08454	12.77	5.60
9102	0.00279	0.00837	12.70	5.39
13715	0.00185	0.00555	12.68	5.36

CALCULATION MODEL : VAPOUR CLOUD EXPLOSION----METHANE

AMOUNT OF EXPLOSIVE MATERIAL = 3796052 M³
 REACTIVITY = LOW EXPLOSIVE
 TEMPERATURE = 20.0 C.

DISTANCE (M)	PEAK OVERPRESSURE		POS. PHASE DURATION	
	MIN. (Bar)	MAX. (Bar)	MIN. (S)	MAX. (S)
303 M GIVEN POINT IS IN THE VAPOUR CLOUD				
837	0.02712	0.08135	11.41	5.01
910	0.02494	0.07482	11.41	5.00
1784	0.01272	0.03817	11.39	4.94
3034	0.00748	0.02244	11.38	4.90
901	0.02519	0.07557	11.41	5.00
9102	0.00249	0.00748	11.35	4.81
13715	0.00165	0.00496	11.34	4.78

CALCULATION MODEL : VAPOUR CLOUD EXPLOSION----METHANE

AMOUNT OF EXPLOSIVE MATERIAL = 1062894 M³
 REACTIVITY = LOW EXPLOSIVE
 TEMPERATURE = 20.0 C.

DISTANCE (M)	PEAK OVERPRESSURE		POS.PHASE DURATION	
	MIN. (Bar)	MAX. (Bar)	MIN. (S)	MAX. (S)
303 M GIVEN POINT IS IN THE VAPOUR CLOUD				
837	0.01774	0.05322	7.46	3.25
910	0.01632	0.04895	7.46	3.25
1784	0.00832	0.02497	7.45	3.21
3034	0.00489	0.01468	7.44	3.18
901	0.01648	0.04944	7.46	3.25
9102	0.00163	0.00489	7.42	3.13
13715	0.00108	0.00325	7.41	3.11

CALCULATION MODEL : VAPOUR CLOUD EXPLOSION----METHANE

AMOUNT OF EXPLOSIVE MATERIAL = 759210 M³
 REACTIVITY = LOW EXPLOSIVE
 TEMPERATURE = 20.0 C.

DISTANCE (M)	PEAK OVERPRESSURE		POS.PHASE DURATION	
	MIN. (Bar)	MAX. (Bar)	MIN. (S)	MAX. (S)
303 M GIVEN POINT IS IN THE VAPOUR CLOUD				
837	0.01586	0.04757	6.67	2.90
910	0.01459	0.04376	6.66	2.90
1784	0.00744	0.02232	6.65	2.86
3034	0.00437	0.01312	6.64	2.84
901	0.01473	0.04419	6.66	2.90
9102	0.00146	0.00437	6.63	2.79
13715	0.00097	0.00290	6.62	2.78

CALCULATION MODEL : VAPOUR CLOUD EXPLOSION----METHANE

AMOUNT OF EXPLOSIVE MATERIAL = 126029 M³
 REACTIVITY = LOW EXPLOSIVE
 TEMPERATURE = 20.0 C.

DISTANCE (M)	PEAK OVERPRESSURE		POS.PHASE DURATION	
	MIN. (Bar)	MAX. (Bar)	MIN. (S)	MAX. (S)
303	0.02407	0.07222	3.67	1.61
837	0.00872	0.02615	3.66	1.58
910	0.00802	0.02405	3.66	1.58
1784	0.00409	0.01227	3.65	1.56
3034	0.00240	0.00721	3.65	1.55
901	0.00810	0.02429	3.66	1.58
9102	0.00080	0.00240	3.64	1.52
13715	0.00053	0.00160	3.63	1.52

CALCULATION MODEL : VAPOUR CLOUD EXPLOSION----METHANE

AMOUNT OF EXPLOSIVE MATERIAL = 75921 M³
 REACTIVITY = LOW EXPLOSIVE
 TEMPERATURE = 20.0 C.

DISTANCE (M)	PEAK OVERPRESSURE		POS.PHASE DURATION	
	MIN. (Bar)	MAX. (Bar)	MIN. (S)	MAX. (S)
303	0.02033	0.06100	3.10	1.35
837	0.00736	0.02208	3.09	1.33
910	0.00677	0.02031	3.09	1.33
1784	0.00345	0.01036	3.08	1.31
3034	0.00203	0.00609	3.08	1.30
901	0.00684	0.02051	3.09	1.33
9102	0.00068	0.00203	3.07	1.28
13715	0.00045	0.00135	3.07	1.28

CALCULATION MODEL : VAPOUR CLOUD EXPLOSION----ETHENE

AMOUNT OF EXPLOSIVE MATERIAL = 607872 M³
 REACTIVITY = MEDIUM EXPLOSIVE
 TEMPERATURE = 20.0 C.

DISTANCE (M)	PEAK OVERPRESSURE		POS. PHASE DURATION	
	MIN. (Bar)	MAX. (Bar)	MIN. (S)	MAX. (S)
303 M GIVEN POINT IS IN THE VAPOUR CLOUD				
837	0.05004	0.12511	3.05	1.11
910	0.04603	0.11508	3.05	1.10
1784	0.02348	0.05870	3.02	1.02
3034	0.01381	0.03451	2.99	0.96
901	0.04649	0.11622	3.05	1.10
9102	0.00460	0.01150	2.94	0.86
13715	0.00305	0.00764	2.92	0.83

CALCULATION MODEL : VAPOUR CLOUD EXPLOSION----ETHANE

AMOUNT OF EXPLOSIVE MATERIAL = 67239 M³
 REACTIVITY = MEDIUM EXPLOSIVE
 TEMPERATURE = 20.0 C.

DISTANCE (M)	PEAK OVERPRESSURE		POS. PHASE DURATION	
	MIN. (Bar)	MAX. (Bar)	MIN. (S)	MAX. (S)
303	0.06972	0.17429	1.55	0.58
837	0.02524	0.06310	1.52	0.52
910	0.02321	0.05803	1.52	0.51
1784	0.01184	0.02960	1.50	0.47
3034	0.00696	0.01741	1.49	0.45
901	0.02345	0.05861	1.52	0.51
9102	0.00232	0.00580	1.47	0.41
13715	0.00154	0.00385	1.46	0.40

CALCULATION MODEL : VAPOUR CLOUD EXPLOSION----ETHANE

AMOUNT OF EXPLOSIVE MATERIAL = 567077 M³
 REACTIVITY = MEDIUM EXPLOSIVE
 TEMPERATURE = 20.0 C.

DISTANCE (M)	PEAK OVERPRESSURE		POS.PHASE DURATION	
	MIN. (Bar)	MAX. (Bar)	MIN. (S)	MAX. (S)
303 M GIVEN POINT IS IN THE VAPOUR CLOUD				
837	0.05137	0.12843	3.14	1.14
910	0.04725	0.11813	3.13	1.13
1784	0.02410	0.06026	3.10	1.05
3034	0.01417	0.03543	3.07	0.99
901	0.04772	0.11931	3.13	1.13
9102	0.00472	0.01181	3.02	0.88
13715	0.00314	0.00784	3.00	0.85

CALCULATION MODEL : VAPOUR CLOUD EXPLOSION----ETHANE

AMOUNT OF EXPLOSIVE MATERIAL = 2835387 M³
 REACTIVITY = MEDIUM EXPLOSIVE
 TEMPERATURE = 20.0 C.

DISTANCE (M)	PEAK OVERPRESSURE		POS.PHASE DURATION	
	MIN. (Bar)	MAX. (Bar)	MIN. (S)	MAX. (S)
303 M GIVEN POINT IS IN THE VAPOUR CLOUD				
837	0.08785	0.21961	5.41	2.07
910	0.08080	0.20200	5.41	2.05
1784	0.04121	0.10304	5.34	1.90
3034	0.02423	0.06059	5.30	1.79
901	0.08161	0.20401	5.41	2.05
9102	0.00808	0.02020	5.20	1.59
13715	0.00536	0.01340	5.17	1.53

CALCULATION MODEL : VAPOUR CLOUD EXPLOSION----AMMONIA

AMOUNT OF EXPLOSIVE MATERIAL = 1001175 M³
 REACTIVITY = LOW EXPLOSIVE
 TEMPERATURE = 20.0 C.

DISTANCE (M)	PEAK OVERPRESSURE		POS. PHASE DURATION	
	MIN. (Bar)	MAX. (Bar)	MIN. (S)	MAX. (S)
303	0.03847	0.11542	5.87	2.59
837	0.01393	0.04178	5.85	2.54
910	0.01281	0.03843	5.85	2.54
1784	0.00653	0.01960	5.84	2.51
3034	0.00384	0.01153	5.83	2.49
901	0.01294	0.03881	5.85	2.54
9102	0.00128	0.00384	5.82	2.45
13715	0.00085	0.00255	5.81	2.44

CALCULATION MODEL : VAPOUR CLOUD EXPLOSION----AMMONIA

AMOUNT OF EXPLOSIVE MATERIAL = 118711 M³
 REACTIVITY = LOW EXPLOSIVE
 TEMPERATURE = 20.0 C.

DISTANCE (M)	PEAK OVERPRESSURE		POS. PHASE DURATION	
	MIN. (Bar)	MAX. (Bar)	MIN. (S)	MAX. (S)
303	0.01890	0.05670	2.88	1.26
837	0.00684	0.02053	2.87	1.23
910	0.00629	0.01888	2.87	1.23
1784	0.00321	0.00963	2.86	1.22
3034	0.00189	0.00566	2.86	1.21
901	0.00636	0.01907	2.87	1.23
9102	0.00063	0.00189	2.85	1.19
13715	0.00042	0.00125	2.85	1.19

CALCULATION MODEL : VAPOUR CLOUD EXPLOSION----ISOBUTYLENE

AMOUNT OF EXPLOSIVE MATERIAL = 303936 M³
 REACTIVITY = HIGH* EXPLOSIVE
 TEMPERATURE = 20.0 C.

DISTANCE (M)	PEAK OVERPRESSURE		POS. PHASE DURATION	
	MIN. (Bar)	MAX. (Bar)	MIN. (S)	MAX. (S)
303 M GIVEN POINT IS IN THE VAPOUR CLOUD				
837	0.10874	0.23720	0.95	0.29
910	0.10002	0.21445	0.94	0.28
1784	0.05102	0.11263	0.87	0.20
3034	0.03000	0.07839	0.82	0.15
901	0.10102	0.21697	0.94	0.28
9102	0.01000	0.04844	0.74	0.09
13715	0.00664	0.04353	0.72	0.07

CALCULATION MODEL : VAPOUR CLOUD EXPLOSION----ISOBUTYLENE

AMOUNT OF EXPLOSIVE MATERIAL = 36038 M³
 REACTIVITY = HIGH* EXPLOSIVE
 TEMPERATURE = 20.0 C.

DISTANCE (M)	PEAK OVERPRESSURE		POS. PHASE DURATION	
	MIN. (Bar)	MAX. (Bar)	MIN. (S)	MAX. (S)
303	0.14757	2.97565	0.48	0.16
837	0.05342	0.11682	0.43	0.10
910	0.04914	0.10940	0.43	0.09
1784	0.02506	0.07083	0.39	0.07
3034	0.01474	0.05540	0.37	0.05
901	0.04963	0.11024	0.43	0.10
9102	0.00491	0.04103	0.34	0.03
13715	0.00326	0.03863	0.34	0.02

CALCULATION MODEL : VAPOUR CLOUD EXPLOSION----ISOBUTYLENE

AMOUNT OF EXPLOSIVE MATERIAL = 303936 M³
 REACTIVITY = HIGH* EXPLOSIVE
 TEMPERATURE = 20.0 C.

DAMAGE TYPE		DISTANCE TO THE CENTRE OF THE CLOUD		POS. PHASE DURATION	
		MIN. (M)	MAX. (M)	MIN. (S)	MAX (S)
HEAVY	(0.3 Bar)	303	837	0.91	0.41
REPAIRABLE	(0.1 Bar)	910	1784	1.03	0.51
DAMAGE OF GLASS	(0.03 Bar)	3034	4901	1.17	0.91
CRACK OF WINDOWS	(0.01 Bar)	9102	13715	1.29	1.31

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPENE

AMBIENT TEMPERATURE = 15. (C.)
AMOUNT OF GAS = 60000 (KG)
DIAMETER CLOUD = 231.5 (M)
DURATION OF FIRE-BALL = 14.9 (S)
INTENSITY OF RADIATION = 170.6 (KW/M²)
RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
127.3	119.5
138.9	94.3
150.4	77.5
162.0	65.1
173.6	55.6
231.5	29.4
347.2	12.3
462.9	6.7
578.6	4.1
1157.3	1.0
1735.9	0.4
2314.6	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPENE

AMBIENT TEMPERATURE = 15. (C.)
AMOUNT OF GAS = 60000 (KG)
DIAMETER CLOUD = 231.5 (M)
DURATION OF FIRE-BALL = 14.9 (S)
INTENSITY OF RADIATION = 170.6 (KW/M²)
RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
127.3	118.2
138.9	93.3
150.4	76.7
162.0	64.4
173.6	55.0
231.5	29.1
347.2	12.1
462.9	6.6
578.6	4.1
1157.3	1.0
1735.9	0.4
2314.6	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPENE

AMBIENT TEMPERATURE = 20. (C.)
AMOUNT OF GAS = 60000 (KG)
DIAMETER CLOUD = 231.5 (M)
DURATION OF FIRE-BALL = 14.9 (S)
INTENSITY OF RADIATION = 170.6 (KW/M²)
RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE(M)	MAX.THERMAL LOAD (KW/M ²)
127.3	114.9
138.9	90.7
150.4	74.5
162.0	62.6
173.6	53.4
231.5	28.2
347.2	11.8
462.9	6.4
578.6	4.0
1157.3	0.9
1735.9	0.4
2314.6	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPENE

AMBIENT TEMPERATURE = 20. (C.)
AMOUNT OF GAS = 60000 (KG)
DIAMETER CLOUD = 231.5 (M)
DURATION OF FIRE-BALL = 14.9 (S)
INTENSITY OF RADIATION = 170.6 (KW/M²)
RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE(M)	MAX.THERMAL LOAD (KW/M ²)
127.3	116.1
138.9	91.7
150.4	75.3
162.0	63.3
173.6	54.0
231.5	28.5
347.2	11.9
462.9	6.5
578.6	4.0
1157.3	0.9
1735.9	0.4
2314.6	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPENE

AMBIENT TEMPERATURE = 20. (C.)
AMOUNT OF GAS = 83000 (KG)
DIAMETER CLOUD = 257.2 (M)
DURATION OF FIRE-BALL = 16.2 (S)
INTENSITY OF RADIATION = 170.6 (KW/M²)
RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
141.5	115.0
154.3	90.8
167.2	74.6
180.0	62.7
192.9	53.5
257.2	28.3
385.8	11.8
514.4	6.4
643.0	4.0
1286.0	0.9
1929.0	0.4
2572.0	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPENE

AMBIENT TEMPERATURE = 20. (C.)
AMOUNT OF GAS = 83000 (KG)
DIAMETER CLOUD = 257.2 (M)
DURATION OF FIRE-BALL = 16.2 (S)
INTENSITY OF RADIATION = 170.6 (KW/M²)
RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
141.5	113.8
154.3	89.8
167.2	73.8
180.0	62.0
192.9	52.9
257.2	28.0
385.8	11.7
514.4	6.3
643.0	4.0
1286.0	0.9
1929.0	0.4
2572.0	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPENE

AMBIENT TEMPERATURE = 15. (C.)
AMOUNT OF GAS = 83000 (KG)
DIAMETER CLOUD = 257.2 (M)
DURATION OF FIRE-BALL = 16.2 (S)
INTENSITY OF RADIATION = 170.6 (KW/M²)
RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE(M)	MAX.THERMAL LOAD (KW/M ²)
141.5	117.1
154.3	92.4
167.2	75.9
180.0	63.8
192.9	54.5
257.2	28.8
385.8	12.0
514.4	6.5
643.0	4.1
1286.0	0.9
1929.0	0.4
2572.0	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPENE

AMBIENT TEMPERATURE = 15. (C.)
AMOUNT OF GAS = 83000 (KG)
DIAMETER CLOUD = 257.2 (M)
DURATION OF FIRE-BALL = 16.2 (S)
INTENSITY OF RADIATION = 170.6 (KW/M²)
RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE(M)	MAX.THERMAL LOAD (KW/M ²)
141.5	118.3
154.3	93.4
167.2	76.7
180.0	64.5
192.9	55.1
257.2	29.1
385.8	12.1
514.4	6.6
643.0	4.1
1286.0	1.0
1929.0	0.4
2572.0	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPENE

AMBIENT TEMPERATURE = 20. (C.)
AMOUNT OF GAS = 500000 (KG)
DIAMETER CLOUD = 461.0 (M)
DURATION OF FIRE-BALL = 25.8 (S)
INTENSITY OF RADIATION = 170.6 (KW/M²)
RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
253.6	109.1
276.6	86.1
299.7	70.8
322.7	59.5
345.8	50.8
461.0	26.8
691.6	11.2
922.1	6.1
1152.6	3.8
2305.2	0.9
3457.8	0.4
4610.4	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPENE

AMBIENT TEMPERATURE = 15. (C.)
AMOUNT OF GAS = 500000 (KG)
DIAMETER CLOUD = 461.0 (M)
DURATION OF FIRE-BALL = 25.8 (S)
INTENSITY OF RADIATION = 170.6 (KW/M²)
RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
253.6	112.3
276.6	88.6
299.7	72.8
322.7	61.2
345.8	52.2
461.0	27.6
691.6	11.5
922.1	6.3
1152.6	3.9
2305.2	0.9
3457.8	0.4
4610.4	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPENE

AMBIENT TEMPERATURE = 15. (C.)
 AMOUNT OF GAS = 500000 (KG)
 DIAMETER CLOUD = 461.0 (M)
 DURATION OF FIRE-BALL = 25.8 (S)
 INTENSITY OF RADIATION = 170.6 (KW/M²)
 RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE(M)	MAX.THERMAL LOAD (KW/M ²)
253.6	111.1
276.6	87.7
299.7	72.0
322.7	60.5
345.8	51.7
461.0	27.3
691.6	11.4
922.1	6.2
1152.6	3.9
2305.2	0.9
3457.8	0.4
4610.4	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPENE

AMBIENT TEMPERATURE = 20. (C.)
 AMOUNT OF GAS = 500000 (KG)
 DIAMETER CLOUD = 461.0 (M)
 DURATION OF FIRE-BALL = 25.8 (S)
 INTENSITY OF RADIATION = 170.6 (KW/M²)
 RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE(M)	MAX.THERMAL LOAD (KW/M ²)
253.6	108.0
276.6	85.2
299.7	70.0
322.7	58.8
345.8	50.2
461.0	26.5
691.6	11.1
922.1	6.0
1152.6	3.7
2305.2	0.9
3457.8	0.4
4610.4	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPENE

AMBIENT TEMPERATURE = 15. (C.)
AMOUNT OF GAS = 700000 (KG)
DIAMETER CLOUD = 514.3 (M)
DURATION OF FIRE-BALL = 28.2 (S)
INTENSITY OF RADIATION = 170.6 (KW/M²)
RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
282.9	111.2
308.6	87.8
334.3	72.1
360.0	60.6
385.7	51.7
514.3	27.3
771.5	11.4
1028.6	6.2
1285.8	3.9
2571.6	0.9
3857.4	0.4
5143.2	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPENE

AMBIENT TEMPERATURE = 15. (C.)
AMOUNT OF GAS = 700000 (KG)
DIAMETER CLOUD = 514.3 (M)
DURATION OF FIRE-BALL = 28.2 (S)
INTENSITY OF RADIATION = 170.6 (KW/M²)
RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
282.9	110.0
308.6	86.8
334.3	71.3
360.0	59.9
385.7	51.2
514.3	27.0
771.5	11.3
1028.6	6.1
1285.8	3.8
2571.6	0.9
3857.4	0.4
5143.2	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPENE

AMBIENT TEMPERATURE = 20. (C.)
AMOUNT OF GAS = 700000 (KG)
DIAMETER CLOUD = 514.3 (M)
DURATION OF FIRE-BALL = 28.2 (S)
INTENSITY OF RADIATION = 170.6 (KW/M²)
RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
282.9	106.9
308.6	84.4
334.3	69.3
360.0	58.3
385.7	49.7
514.3	26.3
771.5	11.0
1028.6	6.0
1285.8	3.7
2571.6	0.9
3857.4	0.4
5143.2	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPENE

AMBIENT TEMPERATURE = 20. (C.)
AMOUNT OF GAS = 700000 (KG)
DIAMETER CLOUD = 514.3 (M)
DURATION OF FIRE-BALL = 28.2 (S)
INTENSITY OF RADIATION = 170.6 (KW/M²)
RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
282.9	108.1
308.6	85.3
334.3	70.1
360.0	58.9
385.7	50.3
514.3	26.6
771.5	11.1
1028.6	6.0
1285.8	3.8
2571.6	0.9
3857.4	0.4
5143.2	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPANE

AMBIENT TEMPERATURE = 20. (C.)
AMOUNT OF GAS = 500000 (KG)
DIAMETER CLOUD = 461.0 (M)
DURATION OF FIRE-BALL = 25.8 (S)
INTENSITY OF RADIATION = 174.2 (KW/M²)
RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
253.6	111.4
276.6	87.9
299.7	72.2
322.7	60.7
345.8	51.8
461.0	27.4
691.6	11.4
922.1	6.2
1152.6	3.9
2305.2	0.9
3457.8	0.4
4610.4	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPANE

AMBIENT TEMPERATURE = 20. (C.)
AMOUNT OF GAS = 500000 (KG)
DIAMETER CLOUD = 461.0 (M)
DURATION OF FIRE-BALL = 25.8 (S)
INTENSITY OF RADIATION = 174.2 (KW/M²)
RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
253.6	110.2
276.6	87.0
299.7	71.5
322.7	60.1
345.8	51.3
461.0	27.1
691.6	11.3
922.1	6.1
1152.6	3.8
2305.2	0.9
3457.8	0.4
4610.4	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPENE

AMBIENT TEMPERATURE = 15. (C.)
AMOUNT OF GAS = 700000 (KG)
DIAMETER CLOUD = 514.3 (M)
DURATION OF FIRE-BALL = 28.2 (S)
INTENSITY OF RADIATION = 170.6 (KW/M²)
RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE(M)	MAX.THERMAL LOAD (KW/M ²)
282.9	110.0
308.6	86.8
334.3	71.3
360.0	59.9
385.7	51.2
514.3	27.0
771.5	11.3
1028.6	6.1
1285.8	3.8
2571.6	0.9
3857.4	0.4
5143.2	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPANE

AMBIENT TEMPERATURE = 15. (C.)
AMOUNT OF GAS = 60000 (KG)
DIAMETER CLOUD = 231.5 (M)
DURATION OF FIRE-BALL = 14.9 (S)
INTENSITY OF RADIATION = 174.2 (KW/M²)
RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
127.3	121.9
138.9	96.3
150.4	79.1
162.0	66.5
173.6	56.7
231.5	30.0
347.2	12.5
462.9	6.8
578.6	4.2
1157.3	1.0
1735.9	0.4
2314.6	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPANE

AMBIENT TEMPERATURE = 15. (C.)
AMOUNT OF GAS = 700000 (KG)
DIAMETER CLOUD = 514.3 (M)
DURATION OF FIRE-BALL = 28.2 (S)
INTENSITY OF RADIATION = 174.2 (KW/M²)
RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
282.9	112.3
308.6	88.6
334.3	72.8
360.0	61.2
385.7	52.2
514.3	27.6
771.5	11.5
1028.6	6.3
1285.8	3.9
2571.6	0.9
3857.4	0.4
5143.2	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPANE

AMBIENT TEMPERATURE = 15. (C.)
AMOUNT OF GAS = 700000 (KG)
DIAMETER CLOUD = 514.3 (M)
DURATION OF FIRE-BALL = 28.2 (S)
INTENSITY OF RADIATION = 174.2 (KW/M²)
RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
282.9	113.5
308.6	89.6
334.3	73.6
360.0	61.8
385.7	52.8
514.3	27.9
771.5	11.7
1028.6	6.3
1285.8	3.9
2571.6	0.9
3857.4	0.4
5143.2	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPANE

AMBIENT TEMPERATURE = 20. (C.)
AMOUNT OF GAS = 60000 (KG)
DIAMETER CLOUD = 231.5 (M)
DURATION OF FIRE-BALL = 14.9 (S)
INTENSITY OF RADIATION = 174.2 (KW/M²)
RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
127.3	117.3
138.9	92.6
150.4	76.1
162.0	63.9
173.6	54.6
231.5	28.8
347.2	12.0
462.9	6.5
578.6	4.1
1157.3	0.9
1735.9	0.4
2314.6	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPANE

AMBIENT TEMPERATURE = 15. (C.)
 AMOUNT OF GAS = 60000 (KG)
 DIAMETER CLOUD = 231.5 (M)
 DURATION OF FIRE-BALL = 14.9 (S)
 INTENSITY OF RADIATION = 174.2 (KW/M²)
 RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
127.3	120.7
138.9	95.3
150.4	78.3
162.0	65.7
173.6	56.1
231.5	29.7
347.2	12.4
462.9	6.7
578.6	4.2
1157.3	1.0
1735.9	0.4
2314.6	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPANE

AMBIENT TEMPERATURE = 20. (C.)
 AMOUNT OF GAS = 60000 (KG)
 DIAMETER CLOUD = 231.5 (M)
 DURATION OF FIRE-BALL = 14.9 (S)
 INTENSITY OF RADIATION = 174.2 (KW/M²)
 RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
127.3	118.5
138.9	93.6
150.4	76.9
162.0	64.6
173.6	55.1
231.5	29.1
347.2	12.2
462.9	6.6
578.6	4.1
1157.3	1.0
1735.9	0.4
2314.6	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPANE

AMBIENT TEMPERATURE = 20. (C.)
AMOUNT OF GAS = 60000 (KG)
DIAMETER CLOUD = 231.5 (M)
DURATION OF FIRE-BALL = 14.9 (S)
INTENSITY OF RADIATION = 174.2 (KW/M²)
RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
127.3	117.3
138.9	92.6
150.4	76.1
162.0	63.9
173.6	54.6
231.5	28.8
347.2	12.0
462.9	6.5
578.6	4.1
1157.3	0.9
1735.9	0.4
2314.6	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPANE

AMBIENT TEMPERATURE = 15. (C.)
AMOUNT OF GAS = 83000 (KG)
DIAMETER CLOUD = 257.2 (M)
DURATION OF FIRE-BALL = 16.2 (S)
INTENSITY OF RADIATION = 174.2 (KW/M²)
RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
141.5	120.8
154.3	95.4
167.2	78.3
180.0	65.8
192.9	56.2
257.2	29.7
385.8	12.4
514.4	6.7
643.0	4.2
1286.0	1.0
1929.0	0.4
2572.0	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPANE

AMBIENT TEMPERATURE = 15. (C.)
AMOUNT OF GAS = 83000 (KG)
DIAMETER CLOUD = 257.2 (M)
DURATION OF FIRE-BALL = 16.2 (S)
INTENSITY OF RADIATION = 174.2 (KW/M²)
RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
141.5	119.5
154.3	94.4
167.2	77.5
180.0	65.1
192.9	55.6
257.2	29.4
385.8	12.3
514.4	6.7
643.0	4.2
1286.0	1.0
1929.0	0.4
2572.0	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPANE

AMBIENT TEMPERATURE = 20. (C.)
AMOUNT OF GAS = 83000 (KG)
DIAMETER CLOUD = 257.2 (M)
DURATION OF FIRE-BALL = 16.2 (S)
INTENSITY OF RADIATION = 174.2 (KW/M²)
RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
141.5	116.2
154.3	91.7
167.2	75.3
180.0	63.3
192.9	54.0
257.2	28.6
385.8	11.9
514.4	6.5
643.0	4.0
1286.0	0.9
1929.0	0.4
2572.0	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPANE

AMBIENT TEMPERATURE = 20. (C.)
 AMOUNT OF GAS = 83000 (KG)
 DIAMETER CLOUD = 257.2 (M)
 DURATION OF FIRE-BALL = 16.2 (S)
 INTENSITY OF RADIATION = 174.2 (KW/M²)
 RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
141.5	117.4
154.3	92.7
167.2	76.1
180.0	64.0
192.9	54.6
257.2	28.9
385.8	12.1
514.4	6.5
643.0	4.1
1286.0	0.9
1929.0	0.4
2572.0	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPANE

AMBIENT TEMPERATURE = 15. (C.)
 AMOUNT OF GAS = %5000000 (KG)
 DIAMETER CLOUD = 974.4 (M)
 DURATION OF FIRE-BALL = 47.0 (S)
 INTENSITY OF RADIATION = 174.2 (KW/M²)
 RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
535.9	107.1
584.6	84.6
633.4	69.5
682.1	58.4
730.8	49.9
974.4	26.3
1461.6	11.0
1948.8	6.0
2436.0	3.7
4872.0	0.9
7308.0	0.4
9744.1	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPANE

AMBIENT TEMPERATURE = 20. (C.)
AMOUNT OF GAS = %7000000 (KG)
DIAMETER CLOUD = %1087.0 (M)
DURATION OF FIRE-BALL = 51.3 (S)
INTENSITY OF RADIATION = 174.2 (KW/M^2)
RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M^2)
597.9	102.0
652.2	80.5
706.6	66.2
760.9	55.6
815.3	47.5
1087.0	25.1
1630.5	10.5
2174.0	5.7
2717.5	3.5
5435.0	0.8
8152.5	0.4
%10870.1	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPANE

AMBIENT TEMPERATURE = 15. (C.)
AMOUNT OF GAS = %5000000 (KG)
DIAMETER CLOUD = 974.4 (M)
DURATION OF FIRE-BALL = 47.0 (S)
INTENSITY OF RADIATION = 174.2 (KW/M^2)
RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M^2)
535.9	106.0
584.6	83.7
633.4	68.8
682.1	57.8
730.8	49.3
974.4	26.1
1461.6	10.9
1948.8	5.9
2436.0	3.7
4872.0	0.9
7308.0	0.4
9744.1	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPANE

AMBIENT TEMPERATURE = 15. (C.)
 AMOUNT OF GAS = %7000000 (KG)
 DIAMETER CLOUD = %1087.0 (M)
 DURATION OF FIRE-BALL = 51.3 (S)
 INTENSITY OF RADIATION = 174.2 (KW/M²)
 RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE(M)	MAX.THERMAL LOAD (KW/M ²)
597.9	105.0
652.2	82.9
706.6	68.1
760.9	57.2
815.3	48.8
1087.0	25.8
1630.5	10.8
2174.0	5.8
2717.5	3.6
5435.0	0.8
8152.5	0.4
%10870.1	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPANE

AMBIENT TEMPERATURE = 15. (C.)
 AMOUNT OF GAS = %7000000 (KG)
 DIAMETER CLOUD = %1087.0 (M)
 DURATION OF FIRE-BALL = 51.3 (S)
 INTENSITY OF RADIATION = 174.2 (KW/M²)
 RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE(M)	MAX.THERMAL LOAD (KW/M ²)
597.9	106.1
652.2	83.8
706.6	68.8
760.9	57.8
815.3	49.4
1087.0	26.1
1630.5	10.9
2174.0	5.9
2717.5	3.7
5435.0	0.9
8152.5	0.4
%10870.1	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPANE

AMBIENT TEMPERATURE = 20. (C.)
 AMOUNT OF GAS = %7000000 (KG)
 DIAMETER CLOUD = %1087.0 (M)
 DURATION OF FIRE-BALL = 51.3 (S)
 INTENSITY OF RADIATION = 174.2 (KW/M²)
 RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
597.9	103.1
652.2	81.4
706.6	66.9
760.9	56.2
815.3	48.0
1087.0	25.4
1630.5	10.6
2174.0	5.7
2717.5	3.6
5435.0	0.8
8152.5	0.4
%10870.1	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPANE

AMBIENT TEMPERATURE = 20. (C.)
 AMOUNT OF GAS = %2500000 (KG)
 DIAMETER CLOUD = 777.9 (M)
 DURATION OF FIRE-BALL = 39.3 (S)
 INTENSITY OF RADIATION = 174.2 (KW/M²)
 RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
427.8	105.2
466.7	83.0
505.6	68.2
544.5	57.3
583.4	48.9
777.9	25.9
1166.8	10.8
1555.7	5.9
1944.7	3.7
3889.3	0.8
5834.0	0.4
7778.7	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPANE

AMBIENT TEMPERATURE = 15. (C.)
 AMOUNT OF GAS = %2500000 (KG)
 DIAMETER CLOUD = 777.9 (M)
 DURATION OF FIRE-BALL = 39.3 (S)
 INTENSITY OF RADIATION = 174.2 (KW/M²)
 RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
427.8	109.3
466.7	86.3
505.6	70.9
544.5	59.6
583.4	50.9
777.9	26.9
1166.8	11.2
1555.7	6.1
1944.7	3.8
3889.3	0.9
5834.0	0.4
7778.7	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPANE

AMBIENT TEMPERATURE = 15. (C.)
 AMOUNT OF GAS = %2500000 (KG)
 DIAMETER CLOUD = 777.9 (M)
 DURATION OF FIRE-BALL = 39.3 (S)
 INTENSITY OF RADIATION = 174.2 (KW/M²)
 RELATIVE HUMIDITY = 90 (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
427.8	108.2
466.7	85.4
505.6	70.2
544.5	59.0
583.4	50.3
777.9	26.6
1166.8	11.1
1555.7	6.0
1944.7	3.8
3889.3	0.9
5834.0	0.4
7778.7	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---PROPANE

AMBIENT TEMPERATURE = 15. (C.)
AMOUNT OF GAS = %2500000 (KG)
DIAMETER CLOUD = 777.9 (M)
DURATION OF FIRE-BALL = 39.3 (S)
INTENSITY OF RADIATION = 174.2 (KW/M²)
RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE(M)	MAX.THERMAL LOAD (KW/M ²)
427.8	109.3
466.7	86.3
505.6	70.9
544.5	59.6
583.4	50.9
777.9	26.9
1166.8	11.2
1555.7	6.1
1944.7	3.8
3889.3	0.9
5834.0	0.4
7778.7	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---METHANE

AMBIENT TEMPERATURE = 15. (C.)
AMOUNT OF GAS = %2500000 (KG)
DIAMETER CLOUD = 777.9 (M)
DURATION OF FIRE-BALL = 39.3 (S)
INTENSITY OF RADIATION = 179.7 (KW/M²)
RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE(M)	MAX.THERMAL LOAD (KW/M ²)
427.8	111.6
466.7	88.1
505.6	72.4
544.5	60.8
583.4	51.9
777.9	27.4
1166.8	11.5
1555.7	6.2
1944.7	3.9
3889.3	0.9
5834.0	0.4
7778.7	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---METHANE

AMBIENT TEMPERATURE = 15. (C.)
AMOUNT OF GAS = %2500000 (KG)
DIAMETER CLOUD = 777.9 (M)
DURATION OF FIRE-BALL = 39.3 (S)
INTENSITY OF RADIATION = 179.7 (KW/M²)
RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE(M)	MAX.THERMAL LOAD (KW/M ²)
427.8	112.8
466.7	89.0
505.6	73.2
544.5	61.5
583.4	52.5
777.9	27.7
1166.8	11.6
1555.7	6.3
1944.7	3.9
3889.3	0.9
5834.0	0.4
7778.7	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---METHANE

AMBIENT TEMPERATURE = 20. (C.)
 AMOUNT OF GAS = %2500000 (KG)
 DIAMETER CLOUD = 777.9 (M)
 DURATION OF FIRE-BALL = 39.3 (S)
 INTENSITY OF RADIATION = 179.7 (KW/M²)
 RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
427.8	108.5
466.7	85.6
505.6	70.4
544.5	59.1
583.4	50.5
777.9	26.7
1166.8	11.1
1555.7	6.0
1944.7	3.8
3889.3	0.9
5834.0	0.4
7778.7	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---METHANE

AMBIENT TEMPERATURE = 20. (C.)
 AMOUNT OF GAS = %2500000 (KG)
 DIAMETER CLOUD = 777.9 (M)
 DURATION OF FIRE-BALL = 39.3 (S)
 INTENSITY OF RADIATION = 179.7 (KW/M²)
 RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
427.8	109.6
466.7	86.5
505.6	71.1
544.5	59.7
583.4	51.0
777.9	27.0
1166.8	11.3
1555.7	6.1
1944.7	3.8
3889.3	0.9
5834.0	0.4
7778.7	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---METHANE

AMBIENT TEMPERATURE = 15. (C.)
AMOUNT OF GAS = %3500000 (KG)
DIAMETER CLOUD = 867.8 (M)
DURATION OF FIRE-BALL = 42.8 (S)
INTENSITY OF RADIATION = 179.7 (KW/M²)
RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
477.3	111.7
520.7	88.2
564.0	72.4
607.4	60.9
650.8	52.0
867.8	27.5
1301.6	11.5
1735.5	6.2
2169.4	3.9
4338.8	0.9
6508.2	0.4
8677.5	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---METHANE

AMBIENT TEMPERATURE = 15. (C.)
AMOUNT OF GAS = %3500000 (KG)
DIAMETER CLOUD = 867.8 (M)
DURATION OF FIRE-BALL = 42.8 (S)
INTENSITY OF RADIATION = 179.7 (KW/M²)
RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
477.3	110.5
520.7	87.2
564.0	71.7
607.4	60.2
650.8	51.4
867.8	27.2
1301.6	11.3
1735.5	6.2
2169.4	3.8
4338.8	0.9
6508.2	0.4
8677.5	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---METHANE

AMBIENT TEMPERATURE = 20. (C.)
AMOUNT OF GAS = %3500000 (KG)
DIAMETER CLOUD = 867.8 (M)
DURATION OF FIRE-BALL = 42.8 (S)
INTENSITY OF RADIATION = 179.7 (KW/M²)
RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
477.3	107.4
520.7	84.8
564.0	69.7
607.4	58.5
650.8	50.0
867.8	26.4
1301.6	11.0
1735.5	6.0
2169.4	3.7
4338.8	0.9
6508.2	0.4
8677.5	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---METHANE

AMBIENT TEMPERATURE = 20. (C.)
AMOUNT OF GAS = %3500000 (KG)
DIAMETER CLOUD = 867.8 (M)
DURATION OF FIRE-BALL = 42.8 (S)
INTENSITY OF RADIATION = 179.7 (KW/M²)
RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
477.3	108.6
520.7	85.7
564.0	70.4
607.4	59.2
650.8	50.5
867.8	26.7
1301.6	11.1
1735.5	6.0
2169.4	3.8
4338.8	0.9
6508.2	0.4
8677.5	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---ETHENE

AMBIENT TEMPERATURE = 20. (C.)
AMOUNT OF GAS = %3500000 (KG)
DIAMETER CLOUD = 867.8 (M)
DURATION OF FIRE-BALL = 42.8 (S)
INTENSITY OF RADIATION = 171.4 (KW/M²)
RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
477.3	102.4
520.7	80.9
564.0	66.4
607.4	55.8
650.8	47.7
867.8	25.2
1301.6	10.5
1735.5	5.7
2169.4	3.6
4338.8	0.8
6508.2	0.4
8677.5	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---ETHENE

AMBIENT TEMPERATURE = 20. (C.)
AMOUNT OF GAS = %3500000 (KG)
DIAMETER CLOUD = 867.8 (M)
DURATION OF FIRE-BALL = 42.8 (S)
INTENSITY OF RADIATION = 171.4 (KW/M²)
RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
477.3	103.5
520.7	81.7
564.0	67.1
607.4	56.4
650.8	48.2
867.8	25.5
1301.6	10.6
1735.5	5.8
2169.4	3.6
4338.8	0.8
6508.2	0.4
8677.5	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---ETHENE

AMBIENT TEMPERATURE = 15. (C.)
AMOUNT OF GAS = %3500000 (KG)
DIAMETER CLOUD = 867.8 (M)
DURATION OF FIRE-BALL = 42.8 (S)
INTENSITY OF RADIATION = 171.4 (KW/M²)
RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE(M)	MAX.THERMAL LOAD (KW/M ²)
477.3	105.4
520.7	83.2
564.0	68.4
607.4	57.4
650.8	49.0
867.8	25.9
1301.6	10.8
1735.5	5.9
2169.4	3.7
4338.8	0.9
6508.2	0.4
8677.5	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---ETHENE

AMBIENT TEMPERATURE = 15. (C.)
AMOUNT OF GAS = %3500000 (KG)
DIAMETER CLOUD = 867.8 (M)
DURATION OF FIRE-BALL = 42.8 (S)
INTENSITY OF RADIATION = 171.4 (KW/M²)
RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE(M)	MAX.THERMAL LOAD (KW/M ²)
477.3	106.5
520.7	84.1
564.0	69.1
607.4	58.0
650.8	49.6
867.8	26.2
1301.6	10.9
1735.5	5.9
2169.4	3.7
4338.8	0.9
6508.2	0.4
8677.5	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---ETHENE

AMBIENT TEMPERATURE = 15. (C.)
 AMOUNT OF GAS = %2500000 (KG)
 DIAMETER CLOUD = 777.9 (M)
 DURATION OF FIRE-BALL = 39.3 (S)
 INTENSITY OF RADIATION = 171.4 (KW/M²)
 RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
427.8	107.6
466.7	84.9
505.6	69.8
544.5	58.6
583.4	50.1
777.9	26.5
1166.8	11.0
1555.7	6.0
1944.7	3.7
3889.3	0.9
5834.0	0.4
7778.7	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---ETHENE

AMBIENT TEMPERATURE = 15. (C.)
 AMOUNT OF GAS = %2500000 (KG)
 DIAMETER CLOUD = 777.9 (M)
 DURATION OF FIRE-BALL = 39.3 (S)
 INTENSITY OF RADIATION = 171.4 (KW/M²)
 RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
427.8	106.4
466.7	84.0
505.6	69.0
544.5	58.0
583.4	49.5
777.9	26.2
1166.8	10.9
1555.7	5.9
1944.7	3.7
3889.3	0.9
5834.0	0.4
7778.7	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---ETHENE

AMBIENT TEMPERATURE = 20. (C.)
AMOUNT OF GAS = %2500000 (KG)
DIAMETER CLOUD = 777.9 (M)
DURATION OF FIRE-BALL = 39.3 (S)
INTENSITY OF RADIATION = 171.4 (KW/M²)
RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
427.8	103.5
466.7	81.7
505.6	67.1
544.5	56.4
583.4	48.1
777.9	25.4
1166.8	10.6
1555.7	5.8
1944.7	3.6
3889.3	0.8
5834.0	0.4
7778.7	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---ETHENE

AMBIENT TEMPERATURE = 20. (C.)
AMOUNT OF GAS = %2500000 (KG)
DIAMETER CLOUD = 777.9 (M)
DURATION OF FIRE-BALL = 39.3 (S)
INTENSITY OF RADIATION = 171.4 (KW/M²)
RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
427.8	104.6
466.7	82.5
505.6	67.8
544.5	57.0
583.4	48.6
777.9	25.7
1166.8	10.7
1555.7	5.8
1944.7	3.6
3889.3	0.8
5834.0	0.4
7778.7	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---ETHANE

AMBIENT TEMPERATURE = 20. (C.)
AMOUNT OF GAS = %2500000 (KG)
DIAMETER CLOUD = 777.9 (M)
DURATION OF FIRE-BALL = 39.3 (S)
INTENSITY OF RADIATION = 170.0 (KW/M²)
RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
427.8	103.7
466.7	81.9
505.6	67.3
544.5	56.5
583.4	48.2
777.9	25.5
1166.8	10.6
1555.7	5.8
1944.7	3.6
3889.3	0.8
5834.0	0.4
7778.7	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---ETHANE

AMBIENT TEMPERATURE = 15. (C.)
AMOUNT OF GAS = %2500000 (KG)
DIAMETER CLOUD = 777.9 (M)
DURATION OF FIRE-BALL = 39.3 (S)
INTENSITY OF RADIATION = 170.0 (KW/M²)
RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
427.8	106.7
466.7	84.2
505.6	69.2
544.5	58.1
583.4	49.6
777.9	26.2
1166.8	11.0
1555.7	5.9
1944.7	3.7
3889.3	0.9
5834.0	0.4
7778.7	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---ETHANE

AMBIENT TEMPERATURE = 15. (C.)
 AMOUNT OF GAS = %2500000 (KG)
 DIAMETER CLOUD = 777.9 (M)
 DURATION OF FIRE-BALL = 39.3 (S)
 INTENSITY OF RADIATION = 170.0 (KW/M²)
 RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
427.8	105.6
466.7	83.3
505.6	68.5
544.5	57.5
583.4	49.1
777.9	26.0
1166.8	10.8
1555.7	5.9
1944.7	3.7
3889.3	0.9
5834.0	0.4
7778.7	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---ETHANE

AMBIENT TEMPERATURE = 20. (C.)
 AMOUNT OF GAS = %2500000 (KG)
 DIAMETER CLOUD = 777.9 (M)
 DURATION OF FIRE-BALL = 39.3 (S)
 INTENSITY OF RADIATION = 170.0 (KW/M²)
 RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
427.8	102.6
466.7	81.0
505.6	66.5
544.5	55.9
583.4	47.7
777.9	25.2
1166.8	10.5
1555.7	5.7
1944.7	3.6
3889.3	0.8
5834.0	0.4
7778.7	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---ETHANE

AMBIENT TEMPERATURE = 20. (C.)
 AMOUNT OF GAS = %3500000 (KG)
 DIAMETER CLOUD = 867.8 (M)
 DURATION OF FIRE-BALL = 42.8 (S)
 INTENSITY OF RADIATION = 170.0 (KW/M²)
 RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
477.3	102.7
520.7	81.1
564.0	66.6
607.4	56.0
650.8	47.8
867.8	25.2
1301.6	10.5
1735.5	5.7
2169.4	3.6
4338.8	0.8
6508.2	0.4
8677.5	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---ETHANE

AMBIENT TEMPERATURE = 20. (C.)
 AMOUNT OF GAS = %3500000 (KG)
 DIAMETER CLOUD = 867.8 (M)
 DURATION OF FIRE-BALL = 42.8 (S)
 INTENSITY OF RADIATION = 170.0 (KW/M²)
 RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
477.3	101.6
520.7	80.2
564.0	65.9
607.4	55.4
650.8	47.3
867.8	25.0
1301.6	10.4
1735.5	5.7
2169.4	3.5
4338.8	0.8
6508.2	0.4
8677.5	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---ETHANE

AMBIENT TEMPERATURE = 15. (C.)
AMOUNT OF GAS = %3500000 (KG)
DIAMETER CLOUD = 867.8 (M)
DURATION OF FIRE-BALL = 42.8 (S)
INTENSITY OF RADIATION = 170.0 (KW/M²)
RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
477.3	104.5
520.7	82.5
564.0	67.8
607.4	57.0
650.8	48.6
867.8	25.7
1301.6	10.7
1735.5	5.8
2169.4	3.6
4338.8	0.8
6508.2	0.4
8677.5	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---ETHANE

AMBIENT TEMPERATURE = 15. (C.)
AMOUNT OF GAS = %3500000 (KG)
DIAMETER CLOUD = 867.8 (M)
DURATION OF FIRE-BALL = 42.8 (S)
INTENSITY OF RADIATION = 170.0 (KW/M²)
RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
477.3	105.6
520.7	83.4
564.0	68.5
607.4	57.6
650.8	49.2
867.8	26.0
1301.6	10.8
1735.5	5.9
2169.4	3.7
4338.8	0.9
6508.2	0.4
8677.5	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---ISOBUTYLENE

AMBIENT TEMPERATURE = 15. (C.)
 AMOUNT OF GAS = 60000 (KG)
 DIAMETER CLOUD = 231.5 (M)
 DURATION OF FIRE-BALL = 14.9 (S)
 INTENSITY OF RADIATION = 171.9 (KW/M²)
 RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
127.3	120.4
138.9	95.0
150.4	78.1
162.0	65.6
173.6	56.0
231.5	29.6
347.2	12.4
462.9	6.7
578.6	4.2
1157.3	1.0
1735.9	0.4
2314.6	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---ISOBUTYLENE

AMBIENT TEMPERATURE = 15. (C.)
 AMOUNT OF GAS = 60000 (KG)
 DIAMETER CLOUD = 231.5 (M)
 DURATION OF FIRE-BALL = 14.9 (S)
 INTENSITY OF RADIATION = 171.9 (KW/M²)
 RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
127.3	119.1
138.9	94.0
150.4	77.2
162.0	64.9
173.6	55.4
231.5	29.3
347.2	12.2
462.9	6.6
578.6	4.1
1157.3	1.0
1735.9	0.4
2314.6	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---ISOBUTYLENE

AMBIENT TEMPERATURE = 20. (C.)
 AMOUNT OF GAS = 60000 (KG)
 DIAMETER CLOUD = 231.5 (M)
 DURATION OF FIRE-BALL = 14.9 (S)
 INTENSITY OF RADIATION = 171.9 (KW/M²)
 RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
127.3	115.7
138.9	91.4
150.4	75.1
162.0	63.1
173.6	53.8
231.5	28.5
347.2	11.9
462.9	6.4
578.6	4.0
1157.3	0.9
1735.9	0.4
2314.6	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---ISOBUTYLENE

AMBIENT TEMPERATURE = 20. (C.)
 AMOUNT OF GAS = 83000 (KG)
 DIAMETER CLOUD = 257.2 (M)
 DURATION OF FIRE-BALL = 16.2 (S)
 INTENSITY OF RADIATION = 171.9 (KW/M²)
 RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
141.5	115.9
154.3	91.5
167.2	75.1
180.0	63.1
192.9	53.9
257.2	28.5
385.8	11.9
514.4	6.5
643.0	4.0
1286.0	0.9
1929.0	0.4
2572.0	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---ISOBUTYLENE

AMBIENT TEMPERATURE = 20. (C.)
 AMOUNT OF GAS = 83000 (KG)
 DIAMETER CLOUD = 257.2 (M)
 DURATION OF FIRE-BALL = 16.2 (S)
 INTENSITY OF RADIATION = 171.9 (KW/M²)
 RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
141.5	114.6
154.3	90.5
167.2	74.4
180.0	62.5
192.9	53.3
257.2	28.2
385.8	11.8
514.4	6.4
643.0	4.0
1286.0	0.9
1929.0	0.4
2572.0	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---ISOBUTYLENE

AMBIENT TEMPERATURE = 20. (C.)
 AMOUNT OF GAS = 700000 (KG)
 DIAMETER CLOUD = 514.3 (M)
 DURATION OF FIRE-BALL = 28.2 (S)
 INTENSITY OF RADIATION = 171.9 (KW/M²)
 RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
282.9	107.7
308.6	85.0
334.3	69.9
360.0	58.7
385.7	50.1
514.3	26.5
771.5	11.1
1028.6	6.0
1285.8	3.7
2571.6	0.9
3857.4	0.4
5143.2	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---ISOBUTYLENE

AMBIENT TEMPERATURE = 15. (C.)
 AMOUNT OF GAS = 700000 (KG)
 DIAMETER CLOUD = 514.3 (M)
 DURATION OF FIRE-BALL = 28.2 (S)
 INTENSITY OF RADIATION = 171.9 (KW/M^2)
 RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M^2)
282.9	110.8
308.6	87.5
334.3	71.9
360.0	60.4
385.7	51.6
514.3	27.2
771.5	11.4
1028.6	6.2
1285.8	3.8
2571.6	0.9
3857.4	0.4
5143.2	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---ISOBUTYLENE

AMBIENT TEMPERATURE = 15. (C.)
 AMOUNT OF GAS = 700000 (KG)
 DIAMETER CLOUD = 514.3 (M)
 DURATION OF FIRE-BALL = 28.2 (S)
 INTENSITY OF RADIATION = 171.9 (KW/M^2)
 RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M^2)
282.9	112.0
308.6	88.4
334.3	72.6
360.0	61.0
385.7	52.1
514.3	27.5
771.5	11.5
1028.6	6.2
1285.8	3.9
2571.6	0.9
3857.4	0.4
5143.2	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---ISOBUTYLENE

AMBIENT TEMPERATURE = 20. (C.)
AMOUNT OF GAS = 700000 (KG)
DIAMETER CLOUD = 514.3 (M)
DURATION OF FIRE-BALL = 28.2 (S)
INTENSITY OF RADIATION = 171.9 (KW/M²)
RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
282.9	108.9
308.6	85.9
334.3	70.6
360.0	59.3
385.7	50.6
514.3	26.8
771.5	11.2
1028.6	6.1
1285.8	3.8
2571.6	0.9
3857.4	0.4
5143.2	0.2

CALCULATION MODEL : HEAT RADIATION FIRE BALL---AMMONIA

AMBIENT TEMPERATURE = 15. (C.)
AMOUNT OF GAS = 700000 (KG)
DIAMETER CLOUD = 514.3 (M)
DURATION OF FIRE-BALL = 28.2 (S)
INTENSITY OF RADIATION = 27.2 (KW/M²)
RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
282.9	17.5
308.6	13.8
334.3	11.4
360.0	9.6
385.7	8.2
514.3	4.3
771.5	1.8
1028.6	1.0
1285.8	0.6
2571.6	0.1
3857.4	0.1
5143.2	0.0

CALCULATION MODEL : HEAT RADIATION FIRE BALL---AMMONIA

AMBIENT TEMPERATURE = 20. (C.)
AMOUNT OF GAS = 700000 (KG)
DIAMETER CLOUD = 514.3 (M)
DURATION OF FIRE-BALL = 28.2 (S)
INTENSITY OF RADIATION = 27.2 (KW/M²)
RELATIVE HUMIDITY = 90. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE (M)	MAX.THERMAL LOAD (KW/M ²)
282.9	17.0
308.6	13.4
334.3	11.0
360.0	9.3
385.7	7.9
514.3	4.2
771.5	1.7
1028.6	0.9
1285.8	0.6
2571.6	0.1
3857.4	0.1
5143.2	0.0

CALCULATION MODEL : VAPOUR CLOUD EXPLOSION----METHANE

AMOUNT OF EXPLOSIVE MATERIAL = 75921 M³
 REACTIVITY = LOW EXPLOSIVE
 TEMPERATURE = 20.0 C.

DISTANCE (M)	PEAK OVERPRESSURE		POS. PHASE DURATION	
	MIN. (Bar)	MAX. (Bar)	MIN. (S)	MAX. (S)
303	0.02033	0.06100	3.10	1.35
837	0.00736	0.02208	3.09	1.33
910	0.00677	0.02031	3.09	1.33
1784	0.00345	0.01036	3.08	1.31
3034	0.00203	0.00609	3.08	1.30
901	0.00684	0.02051	3.09	1.33
9102	0.00068	0.00203	3.07	1.28
13715	0.00045	0.00135	3.07	1.28

CALCULATION MODEL : VAPOUR CLOUD EXPLOSION----METHANE

AMOUNT OF EXPLOSIVE MATERIAL = 75921 M³
 REACTIVITY = LOW EXPLOSIVE
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DISTANCE (M)	PEAK OVERPRESSURE		POS. PHASE DURATION	
	MIN. (Bar)	MAX. (Bar)	MIN. (S)	MAX. (S)
303	0.02033	0.06100	3.10	1.35
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1784	0.00345	0.01036	3.08	1.31
3034	0.00203	0.00609	3.08	1.30
901	0.00684	0.02051	3.09	1.33
9102	0.00068	0.00203	3.07	1.28
13715	0.00045	0.00135	3.07	1.28

CALCULATION MODEL : HEAT RADIATION FIRE BALL---AMMONIA

AMBIENT TEMPERATURE = 20. (C.)
 AMOUNT OF GAS = 700000 (KG)
 DIAMETER CLOUD = 514.3 (M)
 DURATION OF FIRE-BALL = 28.2 (S)
 INTENSITY OF RADIATION = 27.2 (KW/M²)
 RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE(M)	MAX.THERMAL LOAD (KW/M ²)
282.9	17.2
308.6	13.6
334.3	11.2
360.0	9.4
385.7	8.0
514.3	4.2
771.5	1.8
1028.6	1.0
1285.8	0.6
2571.6	0.1
3857.4	0.1
5143.2	0.0

CALCULATION MODEL : HEAT RADIATION FIRE BALL---AMMONIA

AMBIENT TEMPERATURE = 15. (C.)
 AMOUNT OF GAS = 700000 (KG)
 DIAMETER CLOUD = 514.3 (M)
 DURATION OF FIRE-BALL = 28.2 (S)
 INTENSITY OF RADIATION = 27.2 (KW/M²)
 RELATIVE HUMIDITY = 80. (%)

THE THERMAL LOAD IS CALCULATED FROM THE CENTRE OF THE FIRE-BALL

DISTANCE(M)	MAX.THERMAL LOAD (KW/M ²)
282.9	17.7
308.6	14.0
334.3	11.5
360.0	9.7
385.7	8.2
514.3	4.4
771.5	1.8
1028.6	1.0
1285.8	0.6
2571.6	0.1
3857.4	0.1
5143.2	0.0

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	MIN. (Bar)	MAX. (Bar)	MIN. (S)	MAX. (S)
303	0.02033	0.06100	3.10	1.35
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	MIN. (Bar)	MAX. (Bar)	MIN. (S)	MAX. (S)
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837	0.00736	0.02208	3.09	1.33
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