

ATEX Cylinder



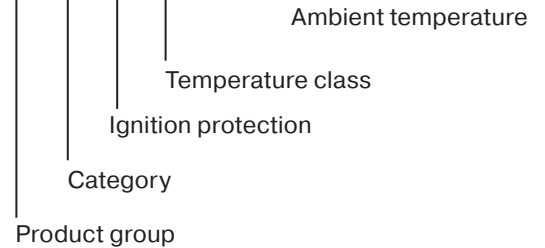
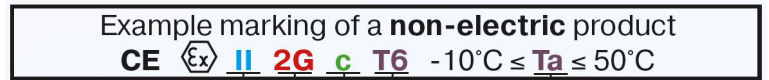
General ATEX-information

page 6

Example marking of an electric product for explosion hazardous environment:



Example marking of a **non-electric product (cylinder)** for explosion hazardous environment:



Product group:

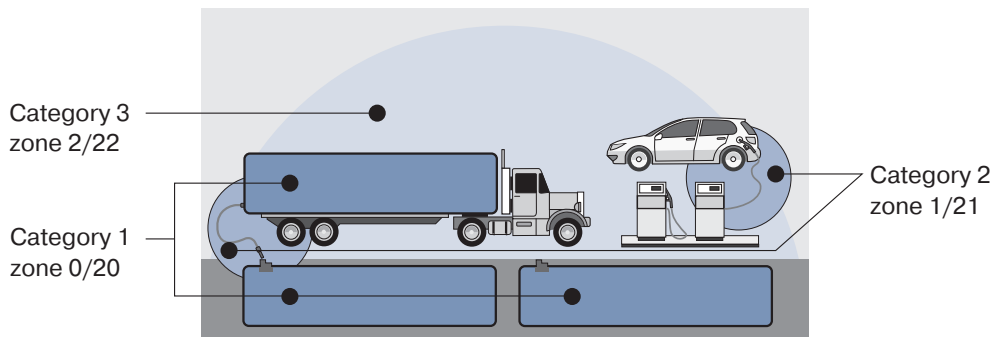
Product group I

Products from product group I are distinguished between M1 and M2. Both are suitable for mining applications. They are not in our focus as Hafner does not offer suitable equipment.

Product group II

All other products for explosion hazardous environment are in this group.

Category:



Category I

An area in which an explosive mixture is continuously present or present for long periods >1000 hours/year.

Category II

An area in which an explosive mixture is occasionally present 10 – 1000 hours/year.

Category III

An area in which an explosive mixture is not likely to occur in normal operation and if it occurs it will exist only for a short time <10 hours/year.

General ATEX-information

	Zones for Gases	Zones for Dust
Category 1	Zone 0 Area in which an explosion hazardous atmosphere consisting of air and inflammable gases, vapors or fog is present constantly or over a longer period of time. > 1000 hours/year	Zone 20 Area in which an explosion hazardous atmosphere consisting of a dust-cloud or a mix of air and dust is present constantly or over a longer period of time. > 1000 hours/year
Category 2	Zone 1 Area in which there is a probability that under normal conditions an explosion hazardous atmosphere consisting of air and inflammable gases, vapors or fog can be present. 10 – 1000 hours/year	Zone 21 Area in which there is a probability that under normal conditions an explosion hazardous atmosphere consisting of a dust-cloud or a mix of air and dust can be present. 10 – 1000 hours/year
Category 3	Zone 2 Area in which once and a while an explosion hazardous atmosphere consisting of air and inflammable gases, steam or vapors can be present. < 10 hours/year	Zone 22 Area in which once and a while an explosion hazardous atmosphere consisting of a dust-cloud or a mix of air and dust can be present. < 10 hours/year

■ Covered by the Hafner product range

Group:

For various substances the explosive and spark ignition capability of a potentially explosive mixture are characteristics. Vapors and gases are classified in groups. The criteria for the subdivision are the maximum experimental safe gap and the minimum ignition current. Those are determined under precisely defined test conditions for various vapors and gases. Please refer to IEC60079-1A and IEC60079-3.

The hazard increases from group IIA to IIC, therefore the requirements applicable to electrical equipment become more strict. Consequently products classified IIC can also be used in IIB and IIA.

Temperatur classes:

Temperature class	Max. permitted surface temperature of equipment
T1	450°C
T2	300°C
T3	200°C
T4	135°C
T5	100°C
T6	85°C

T6 contains all other temperature classes

Cylinder forces

page 8

Round cylinder | ISO 6432

A = Load of spring at rest
B = Load of compressed spring

Spring traction forces:

Ø [mm]		Stroke [mm]		
		10	25	50
		Force [N]		
Ø 8	A	4,1	3,5	2,6
	B	4,5	4,5	4,5
Ø 10	A	4,1	3,5	2,6
	B	4,5	4,5	4,5
Ø 12	A	5,5	4,8	3,5
	B	6	6	6
Ø 16	A	16,5	13,7	9
	B	18,3	18,3	18,3
Ø 20	A	19	15,5	9,5
	B	21,5	21,5	21,5
Ø 25	A	27	24	13,5
	B	29	29	29

Thrust and traction forces:

		[N]*	Ø8	Ø10	Ø12	Ø16	Ø20	Ø25
REM	Thrust		30	42	60	108	168	264
	Traction		18	36	45	96	144	216
RIM	Thrust		30	42	60	108	168	264
	Traction		18	36	45	96	144	216
RBM	Thrust		-	-	-	108	168	264
	Traction		-	-	-	96	144	216
RDM	Thrust		-	-	-	108	168	264
	Traction		-	-	-	96	144	216

Round cylinder | A-Series

Spring traction forces:

Ø [mm]		Stroke [mm]		
		10	25	50
		Force [N]		
Ø 32	A	56	51	42
	B	60	60	60
Ø 40	A	60	55	44
	B	65	65	65
Ø 50	A	64	57	46
	B	68	68	68
Ø 63	A	65	58	47
	B	70	70	70

Thrust and traction forces:

		[N]*	Ø32	Ø40	Ø50	Ø63
A ₋	Thrust		432	660	1050	1680
	Traction		372	570	888	1500

Cylinder with non-rotating piston rod

		[N]*	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100	Ø125	Ø160	Ø200	Ø250	Ø320
D ₋	Thrust		432	660	1050	1680	2700	4200	6624	10645	16633	25990	42582
	Traction		372	570	888	1500	2430	3960	6192	9980	15968	24950	40932

* Theoretical forces at 6 bar pressure, for practical forces please deduct 5% for friction.



Compact cylinder | UNITOP

Thrust and traction forces:

	[N]*	Ø12	Ø16	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
QIN	Thrust	68	121	188	295	483	754	1178	1870	3016	4712
	Traction	51	90	141	247	415	686	1057	1750	2827	4418
QEN	Thrust	68	121	188	295	483	754	1178	1870	3016	4712
	Traction	8	13	17	22	30	36	35	65	94	156
QENV	Thrust	51	90	141	247	415	686	1057	1750	2827	4418
	Traction	8	13	17	22	30	36	35	65	94	156
QBN	Thrust	51	90	141	247	415	686	1057	1750	2827	4418
	Traction	51	90	141	247	415	686	1057	1750	2827	4418
QINT	Thrust	68	121	188	295	483	754	1178	1870	3016	4712
	Traction	51	90	141	247	415	686	1057	1750	2827	4418

Short stroke cylinder**A = Load of spring at rest****B = Load of compressed spring**

Spring traction forces:

Ø [mm]		Stroke [mm]				
		5	10	15	20	25
		Force [N]				
Ø 12	A	7,5	6,8	6	5,2	4,5
	B	8	8	8	8	8
Ø 26	A	12,3	10,8	9,5	7,8	6,5
	B	13,3	13,3	13,3	13,3	13,3
Ø 20	A	15,7	14	12,2	10,4	8,7
	B	17,4	17,4	17,4	17,4	17,4
Ø 25	A	19,5	18,5	17,3	16	15
	B	22	22	22	22	22
Ø 32	A	27,8	25,3	22,8	20,2	17,7
	B	30	30	30	30	30
Ø 40	A	36,4	34	31,7	29,5	27
	B	36	36	36	36	36
Ø 50	A	32	30,5	29	27,8	26,5
	B	35	35	35	35	35
Ø 63	A	61	58,5	56,3	53,5	51,5
	B	64,8	64,8	64,8	64,8	64,8
Ø 80	A	91,3	88	85	82	78,7
	B	94	94	94	94	94
Ø 100	A	150	145	140	134	129
	B	156	156	156	156	156

Thrust and traction forces:

	[N]*	Ø12	Ø16	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
RD	Thrust	68	-	189	-	483	-	1178	1870	-	-
	Traction	51	-	141	-	415	-	1056	1750	-	-
B_	Thrust	60	105	170	264	432	660	1050	1680	2700	4200
	Traction	45	80	125	216	372	600	930	1560	2520	3960

* Theoretical forces at 6 bar pressure, for practical forces please deduct 5% for friction.



Tie-rod compact cylinder

Thrust and traction forces:

	[N]*	Ø125	Ø160	Ø200	Ø250
JEN, JEF, JIN, JIF	Thrust	7280	11960	18720	29350
	Traction	6880	11200	17960	28600
JINT, JBF, JBN	Thrust	6880	11200	17960	28600
	Traction	6880	11200	17960	28600

Double-acting magnetic twin-guide cylinder

Thrust and traction forces:

	[N]*	Ø6	Ø8	Ø12	Ø16	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63
A-CG01	Thrust	-	-	59,9	106,5	166,3	259,9	425,8	665,4	1039,6	1650,5
	Traction	-	-	44,9	79,8	124,8	200,0	319,4	558,9	873,2	1484,1
A-CG02	Thrust	29,9	-	119,8	213,0	332,6	519,8	851,6	-	-	-
	Traction	16,6	-	89,8	159,6	249,6	400,0	638,8	-	-	-
A-CG04	Thrust	34,0	61,0	136,0	241,0	377,0	589,0	-	-	-	-
	Traction	25,0	45,0	102,0	181,0	283,0	454,0	-	-	-	-

Profile cylinder | ISO 15552

Thrust and traction forces:

	[N]*	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100	Ø125	Ø160	Ø200	Ø250	Ø320
HEF	Thrust	432	660	1050	1680	2700	4200	6624	10645	16633	25990	42582
	Traction	372	570	888	1500	2430	3960	6192	9980	15968	24950	40932
DIL	Thrust	483	754	1178	1870	3016	4712	7363	-	-	-	-
	Traction	415	633	990	1682	2721	4418	6881	-	-	-	-
DBL	Thrust	415	633	990	1682	2721	4418	6881	-	-	-	-
	Traction	415	633	990	1682	2721	4418	6881	-	-	-	-
HIF	Thrust	483	754	1178	1870	3016	4712	7363	-	-	-	-
	Traction	415	633	990	1682	2721	4418	6881	-	-	-	-

Tie-rod cylinder | ISO 15552

Thrust and traction forces:

	[N]*	Ø160	Ø200	Ø250	Ø320
DIM	Thrust	12064	18850	29452	48255
	Traction	11310	18096	28274	46558
UDM	Thrust	12064	18850	29450	48250
	Traction	11310	18096	29470	46380
UDMP	Thrust	11310	18096	29470	46380
	Traction	11310	18096	29470	46380

* Theoretical forces at 6 bar pressure, for practical forces please deduct 5% for friction.

Linear cylinder with NAMUR-interface

Thrust and traction forces:

	[N]*	Ø80	Ø100	Ø125	Ø160	Ø200	Ø250	Ø320
LAZ	Thrust	3014	4710	7359	12057	18840	29437	48230
	Traction	2826	4521	6877	11575	18086	28683	47476

Compact cylinder | ISO 21287

Thrust and traction forces:

	[N]*	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
VIN/VIF	Thrust	188	295	482	754	1178	1869	3014	4710
	Traction	142	248	415	687	1058	1750	2829	4420
VINT	Thrust	188	295	482	754	1178	1869	3014	4710
	Traction	142	248	415	687	1058	1750	2829	4420
VBF/VBN	Thrust	142	248	415	687	1058	1750	2829	4420
	Traction	142	248	415	687	1058	1750	2829	4420

* Theoretical forces at 6 bar pressure, for practical forces please deduct 5% for friction.



HAFNER Pneumatika Kft.

page 12



HAFNER Pneumatika Kft. Halászi

