

GRAPHITE BURSTING DISC



ABOUT US

Graphite Technology has a long experience in providing long lasting and highly efficient graphite equipment for the most corrosive applications. GT manufactures equipment in graphite such as heat exchangers, scrubbers, absorbers, separation columns, and rupture discs.

— The Carbon Expert Company — ●●●

RUPTURE DISC

Rupture discs are devices installed in the chemical processes to protect lines and equipment against over or underpressure. They work as a physical barrier that pops open when exposed to a certain limit pressure to protect the installations that do not comply with a possible system pressure out of the allowed range. The lack of protective equipment regarding pressure can cause serious material and personnel damages due to explosions.

The European Community Directive 97/23/CE (PED), concerning pressure equipment, indicates that adequate protection devices must be installed where there is a possibility that the allowable pressure limits are exceeded. The appropriate devices are determined based on the set of equipment and the working conditions. The rupture discs must be designed to be reliable and appropriate to the specific purpose. Moreover, they must work independently from other process functions. Some of the design principles that must be respected include a “fail-safe” system, a redundancy system, the diversity and self-checking system.

The pressure limitation devices generally used are bursting discs and safety valves.

Graphite bursting discs are mostly used:

- In corrosive applications
- In very low calibration pressure applications

The main advantages of graphite bursting disc are:

- It reacts to the excess pressure without inertia, making the opening immediately free for discharge of the pressure.
- When working with corrosive fluids, there is no corrosion or efficiency loss throughout time.
 - Pressure safety valves might get corroded and lose efficiency and reliability throughout time.
- Bursting discs are significantly smaller than safety valves.
- It can be mounted in every position.
- Differently from safety valve it can also protect from depression.
- Differently from safety valve it does not require periodical checks for the calibration.
- It has a high availability of diameters.
- The costs for a bursting disc are lower than those for a safety valve.
- There are no leakages during operation.
- Extremely reliable.

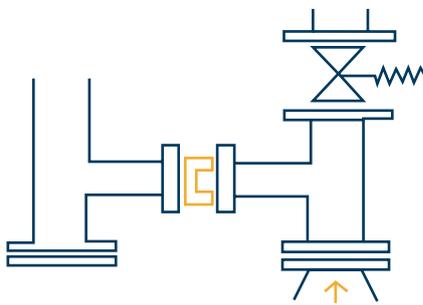
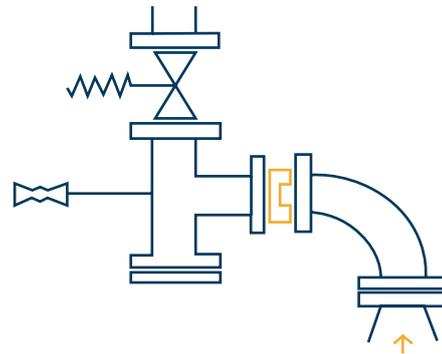


Bursting discs can be used separately or, as more often happens, used with the following possible combinations:

a) Installation in series bursting disc-safety valve

The bursting disc, mounted between the process and the safety valve, protects the valve from corrosive fluids and from the incrustations, reducing its maintenance costs and increasing its lifetime. Moreover, it allows the maintenance of the safety valve (cleaning, calibrations, etc.) without the need to stop the plant.

In this case, the bursting disc has to be calibrated at a rupture pressure slightly lower than the one of the opening of the safety valve.



b) Installation in parallel bursting disc-safety valve

In this case, the bursting disc is calibrated at a pressure slightly higher than the safety valve. It pops open only if the safety fails to open at the calibrated pressure.

c) Installation in parallel bursting disc-bursting disc

In this case, there are two rupture discs: one to protect against overpressure and the other for depression (pressure below allowed range).

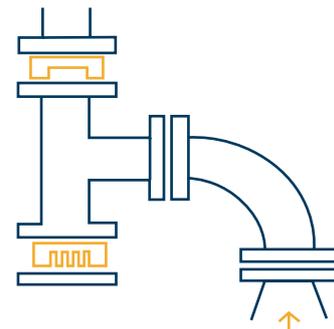
Rupture alarm

As an additional feature, we also offer a rupture alarm. In this case there will be an visual and acoustic signal if the rupture disc pops open.

Inspection tests and certifications

All the bursting discs supplied by Graphite Technology EMEA are provided with inspection test certificates as per European standards.

- For bursting discs with nominal rupture pressure > 0,5 barg we perform inspection tests as per European Directive 97/23/CE (PED)
- For bursting discs with nominal rupture pressure < 0,5 barg we perform our factory inspection test.
- For bursting discs with nominal rupture pressure < 0,5 barg an inspection test conducted from third party (ISPESL inspection test) can be performed if requested by the customer.

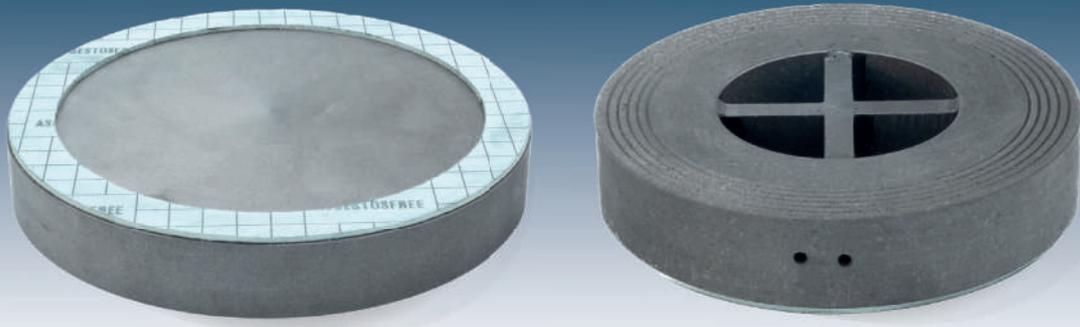


— The Carbon Expert Company

Documentation

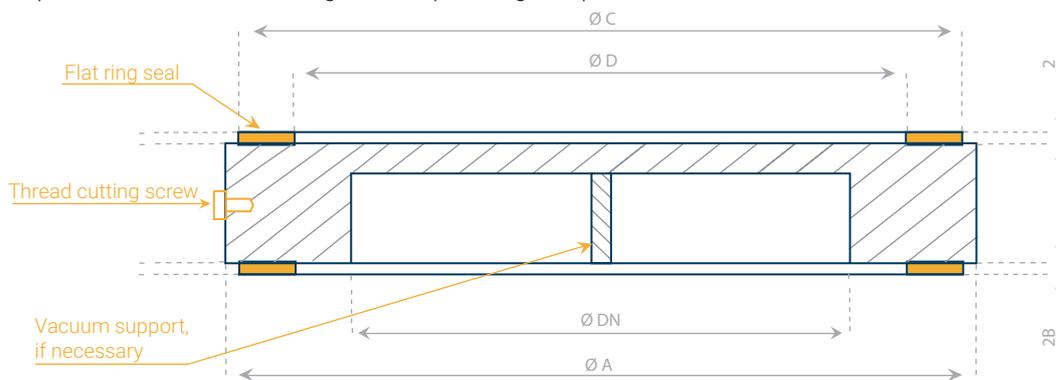
There will be also provided, together with the discs, the following documents:

- Inspection test certificates
- Drawings
- Mounting instructions
- Manual for use and maintenance
- Risk analysis (PED)
- Declaration of conformity (CE).



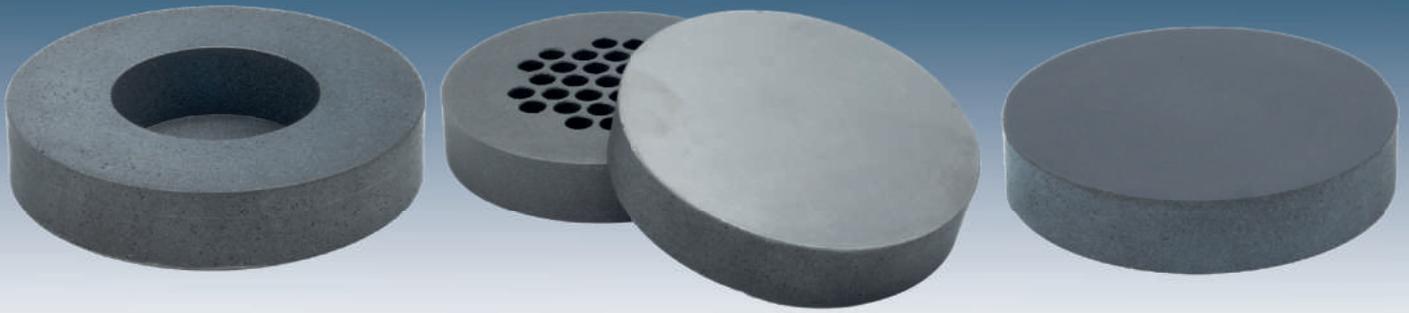
BURSTING DISC TYPE EU-N

Monoblock rupture disc manufactured in graphite impregnated with synthetic resins such as our type EEG-I. In case of rupture pressures below 1.5 barg and the possibility of vacuum, it's necessary to have a cross vault (rigid structure support for vacuum) to be inserted in the disc in different shapes, depending on the diameter of the bursting disc. Rupture pressure varies according to the operating temperature.



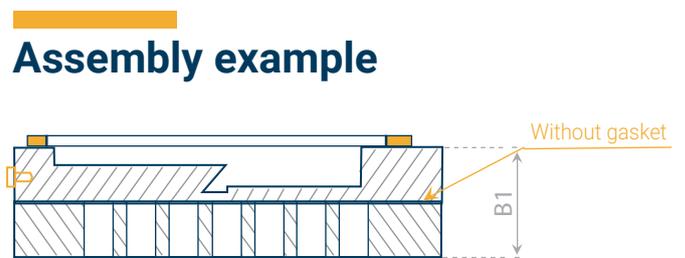
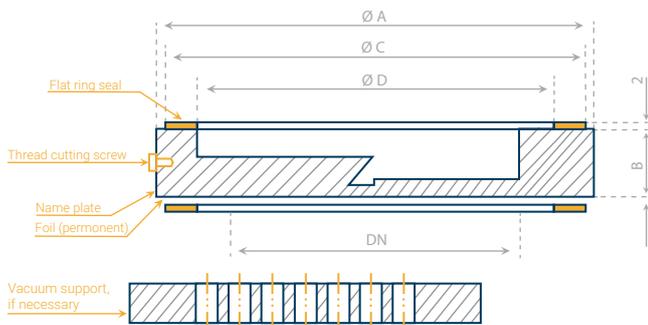
DN		Dimensions size				Free cross section	
						Without vacuum support	With vacuum support
Inches	mm	A	B	C	D	cm ²	cm ²
1	25	65	20	63	45	4.9	3.9
1,5	40	82	20	80	60	12.6	10.2
2	50	100	20	98	75	19.6	16.6
2,5	65	120	23	118	90	33.2	29.3
3	80	130	23	128	100	50.3	38.0
4	100	160	25	158	125	78.5	59.5
5	125	190	27	188	155	123.0	99.0
6	150	215	30	212	180	177.0	142.0
8	200	275	35	268	235	314.0	235.0
10	250	330	40	320	285	491.0	389.0
12	300	380	45	370	335	707.0	515.0
14	350	440	50	430	395	962.0	730.0
16	400	490	50	482	448	1557.0	935.0
20	500	590	55	584	540	1964.0	1540.0
24	600	690	60	684	640	2827.0	2305.0

- Dimensions from DN 25 to DN 600
- Breaking pressure from 0,10 bar g to 80 bar g
- Tempering from -60°C to +180°C
- Tolerance standard +/- 10% - Special cases +/- 5%
- Max service pressure 70 / 75% of the burst pressure



BURSTING DISC TYPE EU-TI

Monoblock disc manufactured in non impervious graphite our type EEG-NI with graphite foil as seal. In case of the possibility of vacuum, it's necessary to have a drilled disc support (rigid structure support for vacuum) depending on the diameter of the bursting disc. The drilled disc is reusable. The rupture pressure does NOT vary according to the operating temperature



DN		Dimensions size					Free cross section	
							Without vacuum support	With vacuum support
Inches	mm	A	B	B1	C	D	cm ²	cm ²
1	25	65	20	40	63	45	4.9	3.0
1,5	40	82	20	40	80	60	12.6	7.5
2	50	100	20	40	98	75	19.6	11.5
2,5	65	120	23	46	118	90	33.2	20.0
3	80	130	23	46	128	100	50.3	30.0
4	100	160	25	50	158	125	78.5	47.0
5	125	190	27	54	188	155	123.0	73.0
6	150	215	30	60	212	180	177.0	106.0
8	200	275	35	70	268	235	314.0	189.0
10	250	330	40	80	320	285	491.0	294.0
12	300	380	45	90	370	335	707.0	424.0
14	350	440	50	100	430	395	962.0	577.0
16	400	490	50	100	482	448	1557.0	754.0
20	500	590	55	105	584	540	1964.0	1178.0
24	600	690	60	110	684	640	2827.0	1696.0

- Dimensions from DN 25 to DN 600
- Breaking pressure from 0,10 bar g to 80 bar g
- Tempering from -60°C to +300°C
- Tolerance standard +/- 10% - Special cases +/- 5%
- Max service pressure 70 / 75% of the burst pressure

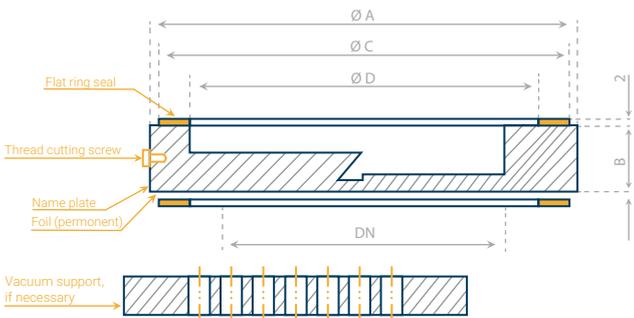


BURSTING DISC TYPE EU-TF

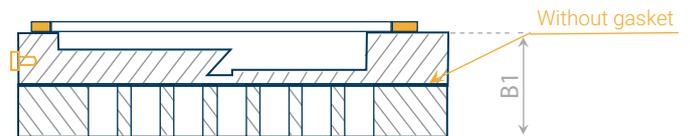
Monoblock disc in non impervious graphite our type EEG-NI with PTFE foil at contact with the product, for sealing. In case of rupture pressures lower than 1,5 bar g and when it exists the possibility of vacuum, it is foreseen a support disc reusable (in graphite or PTFE).

At a temperatures over 100°C, the support in PTFE can be used only for diameters larger than 100 mm.

The rupture pressures don't vary with the temperature.



Assembly example



DN		Dimensions size					Free cross section	
							Without vacuum support	With vacuum support
Inches	mm	A	B	B1	C	D	cm ²	cm ²
1	25	65	20	40	63	45	4.9	3.0
1,5	40	82	20	40	80	60	12.6	7.5
2	50	100	20	40	98	75	19.6	11.5
2,5	65	120	23	46	118	90	33.2	20.0
3	80	130	23	46	128	100	50.3	30.0
4	100	160	25	50	158	125	78.5	47.0
5	125	190	27	54	188	155	123.0	73.0
6	150	215	30	60	212	180	177.0	106.0
8	200	275	35	70	268	235	314.0	189.0
10	250	330	40	80	320	285	491.0	294.0
12	300	380	45	90	370	335	707.0	424.0
14	350	440	50	100	430	395	962.0	577.0
16	400	490	50	100	482	448	1557.0	754.0
20	500	590	55	105	584	540	1964.0	1178.0
24	600	690	60	110	684	640	2827.0	1696.0

- Dimensions from DN 25 to DN 600
- Breaking pressure from 0,20 bar g to 35 bar g
- Tempering from -60°C to +250°C
- Tolerance standard +/- 10%
- Max service pressure 70 / 75% of the burst pressure

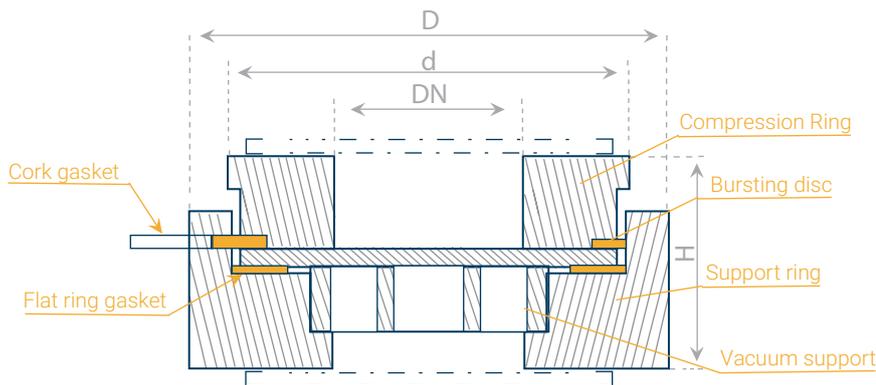


BURSTING DISC TYPE EU-D

Disc composed by three parts: sealing ring, pressure ring and membrane. After the rupture only the membrane has to be changed. Sealing ring in impervious graphite our type EEG-I. Pressure ring in impervious graphite our type EEG-I. Rupture membrane in impervious graphite our type EEG-I or non-impervious graphite our type EEG-NI covered with graphite or PTFE foil.

In case of rupture pressures lower than 1,5 bar g and where there is the possibility of vacuum, it is foreseen a reusable drilled disc in graphite or steel, for support.

The rupture pressure does not vary with temperature for non impervious graphite, while it does vary for impervious graphite.



DN		Dimensions size				Free cross section	
						Without vacuum support	With vacuum support
Inches	mm	D	d	H min.	H max.	cm ²	%
1	25	65	56	25	28	4.9	50
1,5	40	82	68	27	32	12.6	51
2	50	100	78	29	33	19.6	55
2,5	65	120	94	32	37	33.2	53
3	80	130	110	37	42	50.3	63
4	100	160	142	43	49	78.5	60
6	150	215	202	56	65	177.0	60
8	200	275	262	74	85	314.0	60
10	250	330	320	95	115	491.0	58
12	300	380	370	110	125	707.0	56

- Dimensions from DN 25 to DN 600
- Breaking pressure from 0,10 bar g to 30 bar g
- Tempering from -60°C to +180/250/300°C (depending on material used)
- Tolerance standard +/- 10% - Special cases +/- 5%
- Max service pressure 70 / 75% of the burst pressure



Europe - Middle East - Africa

Graphite Technology EMEA BV
The Netherlands
Phone: +(31) 6 468 77106
emea@graphite-technology.com

South Americas

Graphite Technology Brasil
Phone +(55) 45 99 87 69 61
latam@graphite-technology.com

Asia

Graphite Technology Asia Ltd
Hong Kong
Phone: +(86) 021-50885155
info@graphite-technology.com

India

Graphite Technology Processes
Improvement PVT LTD
Mumbai
Phone: +(91) 9730166052
india@graphite-technology.com