donadon SDD

SAFETY DISCS AND DEVICES

THE NEW RUPTURE DISC

Le nouveau disque de rupture ✷ Der neue berstscheibe ✷ El nuevo disco de ruptura ✷ Il nuovo disco di rottura

nano Scored IS HERE!

est ici! ✷ ist da! ✷ ya está aquí! ✷ è qui!

Find out the technology!

CE 0426
Certified for protection of equipment under pressure according to European Directive 97/23/CE (PED)

Ex
Certified EX II 2 GD for use in potentially explosive atmospheres according to European Directive 94/9/CE (ATEX)

KTA 1401
Certified on behalf of the German nuclear power plant operators E.ON Kernkraft GmbH

ACCREDIA L'ENTE DI ACCREDITAMENTO

SISTEMA DI GESTIONE CERTIFICATO
ITALCERT
UNI EN ISO 9001

WWW.DONADONSDD.COM

ITALCERT

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CERTIFICATO N° 322SGQ03

Si certifica che il
This is to certify that

Sistema di Gestione per la Qualità
Quality Management System

messo in atto da
implemented by

DONADON SDD S.r.l.
Via Franceschelli, 7 – IT 20011 CORBETTA (MI)

nella Sedi Operative di
Operative Unit

Via Franceschelli, 7 – IT 20011 CORBETTA (MI)

è conforme alla norma
is in compliance with the standard

UNI EN ISO 9001-2008 (ISO 9001-2008)

per i seguenti Processi
covering the following kinds of Processes

Progettazione e costruzione di dischi di rottura, portadischi, pannelli di sfogo, accessori. Commercializzazione valvole di sicurezza.

Design, Development and Manufacturing of Rupture Discs, Disc Holders, Venting Panels, and accessories. Commercialization of Pressure Relief Valves

Il presente Certificato è soggetto al rispetto delle condizioni stabilite dal "Regolamento per la certificazione di sistema qualità" e dal "Contratto per la certificazione di sistema qualità" n° 271
This Certificate shall comply with the requirements established in the "Rules for the certification of Supplier's Quality System" and in the "Contract for the Certification of Quality System" n° 271

IL PRESIDENTE
THE PRESIDENT
prof. dr. Carlo Tribuno

Data Prima Emissione	Data di Rinnovo	Data di scadenza
First Issue Date	*Renewal Date*	*Expiry date*
2006-03-09	2012-03-09	2015-03-08

Settore IAF 17 – 29a

ACCREDIA

ITALCERT

CERTIFICATO DI APPROVAZIONE QUALITA' DELLA PRODUZIONE N. PED009AD001 rev.0
CERTIFICATE OF APPROVAL OF PRODUCTION QUALITY ASSURANCE NO.
in accordo al modulo D della direttiva 97/23/CE
according to module D of the directive 97/23/EC

Fabbricante / Manufacturer: DONADON SDD S.r.l.
Via Francoschelli, 9 I- 20811 Corbetta MI

Località di fabbricazione / Location of manufacturing: Via Francoschelli, 9 IT 20811 Corbetta MI

Attrezzature a pressione / Pressure Equipment	DISPOSITIVI DI SICUREZZA A DISCO DI ROTTURA / BURSTING DISC SAFETY DEVICES		
Famiglia/Type / Family/Type	C	B	G
Certificato di esame CE di tipo modulo B / EC type examination certificate B	ITALCERT PED009AT100 rev.5	ITALCERT PED009AT200 rev.5	ITALCERT PED009AT300 rev.1

Si attesta la valutazione del sistema qualità in accordo alle disposizioni dell'allegato III modulo D della direttiva 97/23/CE
Having performed the quality system assessment in accordance with the provisions of annex III - module D of the directive 97/23/EC
come da rapporto di valutazione n. PED009AD001 GA
as per assessment report no.

Si certifica che il sistema qualità della produzione relativo alle attrezzature a pressione soprarindicate
We certify that the quality system for the production of pressure equipment listed above
soddisfa le disposizioni applicabili della direttiva 97/23/CE
satisfies the applicable provisions of the directive 97/23/EC

Si autorizza la marcatura / We authorize the marking: CE 0426

Il presente certificato non riconosce nulla a riguardo di processi di consegna dei successivi ordini, le cui modalità applicative e tolleranze eventuali di difformità siano il risultato di accordi tra le parti in deroga a quanto previsto in questo documento. Il fabbricante è responsabile che ogni prodotto sia conforme alla direttiva 97/23/CE e sia coperto dalla dichiarazione di conformità applicabile.
This certificate shall be deemed to be valid and the manufacturer shall never lose all correspondence pertinent to its status and, in case of modification to the product(s), which may affect the compliance with the essential safety requirements or the prescribed conditions for use and, generally, where the manufacturer fails to comply with any of the obligations under directive 97/23/EC as transposed in the applicable national law(s).

Data di prima emissione / Date of first issue: Milano, 26/05/2009
Data di scadenza / Expiry date: 25/05/2015
ITALCERT S.r.l. Il Direttore Tecnico
Prof. Dott. Carlo Trivelli

Rev.1: variazione sede. Data 25/05/2010
Rev.2: Rinnovo certificato. Data 30/05/2012
Rev.3: Rinnovo certificato PED009AT100 e PED009AT100. Data 30/05/2012

ITALCERT

CERTIFICATO DI ESAME CE DI TIPO
EC TYPE EXAMINATION CERTIFICATE
in accordo al modulo B della direttiva 97/23/CE sulle attrezzature a pressione
according to module B of the Directive 97/23/EC on Pressure Equipment

CERTIFICATO N° PED009AT100 rev.5
Certificate no.

Fabbricante / Manufacturer: Donadon SDD S.r.l.
Via Francoschelli, 9 IT 20811 Corbetta MI

Località di fabbricazione / Location of manufacturing: Via Francoschelli, 9 IT 20811 Corbetta MI

Attrezzature a pressione / Pressure Equipment: DISPOSITIVI DI SICUREZZA A DISCO DI ROTTURA / BURSTING DISC SAFETY DEVICES

Famiglia / Family: C — Tipo / Type: BTS - BCB - DDD - TGD - DH

- esaminata la documentazione tecnica presentata dal fabbricante / examined the technical documentation submitted by the manufacturer — doc.n. PED 001 rev.4
- effettuate le verifiche e prove appropriate / performed the appropriate tests and verifications

SI CERTIFICA / It is certified

che i tipi di attrezzature a pressione sopraindicati, esaminati in conformità con le disposizioni dell'allegato III modulo B della direttiva 97/23/CE, soddisfano le disposizioni applicabili della direttiva stessa.
that the types of pressure equipment listed above, examined in accordance with the provisions of annex III module B of the directive 97/23/EC, satisfy the relevant provisions of the directive which apply to them.

Il presente certificato non riconosce nulla a riguardo di processi di consegna dei successivi ordini, le cui modalità applicative e tolleranze eventuali di difformità siano il risultato di accordi tra le parti in deroga a quanto previsto in questo documento. Il fabbricante è responsabile che ogni prodotto sia conforme alla direttiva 97/23/CE e sia coperto dalla dichiarazione di conformità applicabile.
This certificate shall be deemed to be valid and the manufacturer shall never lose all correspondence pertinent to its status and, in case of modification to the product(s), which may affect the compliance with the essential safety requirements or the prescribed conditions for use and, generally, where the manufacturer fails to comply with any of the obligations under directive 97/23/EC as transposed in the applicable national law(s).

Data di prima emissione / Date of issue: Milano, 31/03/2003
Data di scadenza / Expiry date: 19/03/2022
ITALCERT S.r.l. Il Direttore Tecnico
Ing. Roberto Cusatis

Rev.1: variazione fabbricato tecnico. Data: 28-09-2005
Rev.2: cambio ragione sociale. Data: 31-10-2005
Rev.3: variazione sede. Data: 28-03-2008
Rev.4: modifiche dati costruttivi. Data: 27-10-2010
Rev.5: rinnovo decennale del modello. Data: 30/09/2012

ITALCERT

CERTIFICATO DI ESAME CE DI TIPO
EC TYPE EXAMINATION CERTIFICATE
in accordo al modulo B della direttiva 97/23/CE sulle attrezzature a pressione
in accordance with module B of the Directive 97/23/EC on Pressure Equipment

CERTIFICATO N° PED009AT200 rev.5
Certificate no.

Fabbricante / Manufacturer: Donadon SDD S.r.l.
Via Francoschelli, 9 IT 20811 Corbetta MI

Località di fabbricazione / Location of manufacturing: Via Francoschelli, 9 IT 20811 Corbetta MI

Attrezzature a pressione / Pressure Equipment: DISPOSITIVI DI SICUREZZA A DISCO DI ROTTURA / BURSTING DISC SAFETY DEVICES

Famiglia / Family: B — Tipo / Type: YS3 – SCR

- esaminata la documentazione tecnica presentata dal fabbricante / examined the technical documentation submitted by the manufacturer — doc.n. PED 001 rev.5
- effettuate le verifiche e prove appropriate / performed the appropriate tests and verifications

SI CERTIFICA / It is certified

che i tipi di attrezzature a pressione sopraindicati, esaminati in conformità con le disposizioni dell'allegato III modulo B della direttiva 97/23/CE, soddisfano le disposizioni applicabili della direttiva stessa.
that the types of pressure equipment listed above, examined in accordance with the provisions of annex III module B of the directive 97/23/EC, satisfy the relevant provisions of the directive which apply to them.

Il presente certificato non riconosce nulla a riguardo di processi di consegna dei successivi ordini, le cui modalità applicative e tolleranze eventuali di difformità siano il risultato di accordi tra le parti in deroga a quanto previsto in questo documento. Il fabbricante è responsabile che ogni prodotto sia conforme alla direttiva 97/23/CE e sia coperto dalla dichiarazione di conformità applicabile.
This certificate shall be deemed to be valid and the manufacturer shall never lose all correspondence pertinent to its status and, in case of modification to the product(s), which may affect the compliance with the essential safety requirements or the prescribed conditions for use and, generally, where the manufacturer fails to comply with any of the obligations under directive 97/23/EC as transposed in the applicable national law(s).

Luogo di prima emissione / Date of issue: Milano, 31/05/2002
Data di scadenza / Expiry date: 29/05/2022
ITALCERT S.r.l. Il Direttore Tecnico
Ing. Roberto Cusatis

Rev.1 - 28/03/2003 - variazione ragione sociale.
Rev.2 - 07/04/2005 cambio ragione sociale.
Rev.3 - 28/03/2008 variazione sede.
Rev.4 - 31/10/2008 aggiunta tipo SCR
Rev.5 - 30/09/2012 - rinnovo decennale del modello 5. Eliminato tipo RS2

ITALCERT

CERTIFICATO DI ESAME CE DI TIPO
EC TYPE EXAMINATION CERTIFICATE
in accordo al modulo B della direttiva 97/23/CE sulle attrezzature a pressione
in accordance with module B of the Directive 97/23/EC on Pressure Equipment

CERTIFICATO N° PED009AT300 rev.1
Certificate no.

Fabbricante / Manufacturer: Donadon SDD S.r.l.
Via Francoschelli, 9 IT 20811 Corbetta MI

Località di fabbricazione / Location of manufacturing: Via Francoschelli, 9 IT 20811 Corbetta MI

Attrezzature a pressione / Pressure Equipment: DISPOSITIVI DI SICUREZZA A DISCO DI ROTTURA / BURSTING DISC SAFETY DEVICES

Famiglia / Family: G — Tipo / Type: GA - GM - GR

- esaminata la documentazione tecnica presentata dal fabbricante / examined the technical documentation submitted by the manufacturer — doc.n. PED 001 rev.5
- effettuate le verifiche e prove appropriate / performed the appropriate tests and verifications

SI CERTIFICA / It is certified

che i tipi di attrezzature a pressione sopraindicati, esaminati in conformità con le disposizioni dell'allegato III modulo B della direttiva 97/23/CE, soddisfano le disposizioni applicabili della direttiva stessa.
that the types of pressure equipment listed above, examined in accordance with the provisions of annex III module B of the directive 97/23/EC, satisfy the relevant provisions of the directive which apply to them.

Il presente certificato non riconosce nulla a riguardo di processi di consegna dei successivi ordini, le cui modalità applicative e tolleranze eventuali di difformità siano il risultato di accordi tra le parti in deroga a quanto previsto in questo documento. Il fabbricante è responsabile che ogni prodotto sia conforme alla direttiva 97/23/CE e sia coperto dalla dichiarazione di conformità applicabile.
This certificate shall be deemed to be valid and the manufacturer shall never lose all correspondence pertinent to its status and, in case of modification to the product(s), which may affect the compliance with the essential safety requirements or the prescribed conditions for use and, generally, where the manufacturer fails to comply with any of the obligations under directive 97/23/EC as transposed in the applicable national law(s).

Data di emissione / Date of issue: Milano, 07/09/2011
Data di scadenza / Expiry date: 06/09/2016
ITALCERT S.r.l. Il Direttore Tecnico
Ing. Roberto Cusatis

Rev.1 – variazione sede.

eurofins

Modulo Uno

(1) NOTIFICA DELLA GARANZIA QUALITÀ PRODUZIONE

PRODUCTION QUALITY ASSURANCE

EUBH 11 ATEX 6300 Q

CE 2849

eurofins

Modulo Uno

(1) Allegato Notifica Garanzia Qualità Produzione n° /

Annex to production quality assurance n°: EUBH 11 ATEX 6300 Q

DNV - MODULO UNO

(1) ATTESTATO DI ESAME CE DEL TIPO

DNV-MUNO 08 ATEX 3742

CE 0496

DNV - MODULO UNO

(1) ALLEGATO

ATTESTATO DI ESAME CE DEL TIPO N° DNV-MUNO 08 ATEX 3742

DNV - MODULO UNO

DNV - MODULO UNO

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Modulo Uno

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DNV - MODULO UNO

ATTESTATO DI ARCHIVIAZIONE DEL FASCICOLO TECNICO DELLA COSTRUZIONE
ICIM
ATEX -542- 2010
DONADON SDD S.r.l.

ATTESTATO DI ARCHIVIAZIONE DEL FASCICOLO TECNICO DELLA COSTRUZIONE
ICIM
ATEX - 543-2010
DONADON SDD S.r.l.

Confirmation on quality assurance according to nuclear standard KTA 1401

On behalf of the German nuclear power plant operators E.ON Kernkraft GmbH as a partner of the VGB PowerTech e. V. working group "Assessment of Contractors" confirms

Donadon SDD S.R.L.

Via Franceschelli, 7
20011 Corbetta - Milan - Italy

true for the site

Via Franceschelli, 7 / 20011 Corbetta - Milan – Italy

and the scope of supply and services

Planning, Design and Fabrication of Rupture Discs

the qualification for system- and product related quality assurance.

The assessment was performed on 2011-11-22 and 23 by order of

Dr.-Ing. Götz Berenbrock Ingenieurbüro

based on the standard **KTA 1401** as well as on the assessment documents of the VGB PowerTech e. V. working group "Assessment of Contractors" in consideration of product related requirements.

Details of the assessment are given in the report **DGBI 2011/013**

This confirmation is valid until **2014-09-16** provided that the conditions on which the assessment was based have not been changed.

Hannover, December, 20th, 2011

i. V.

E.ON Kernkraft GmbH

i.V.

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DONADON SDD

Rupture discs and Venting panels are the main products of Donadon Safety Discs and Devices Srl ("Donadon SDD") the absolute specialist with more than 60 years of experience in manufacturing Rupture Discs.
The range of safety devices for protection of equipment from pressure variations manufactured by Donadon SDD includes

- Rupture Discs in Stainless steel, special alloys, Nickel, Titanium, ,Tantalum, and graphite
- Venting panels for protection of plants with explosion risk
- Rupture indicators also for explosion atmosphere applications

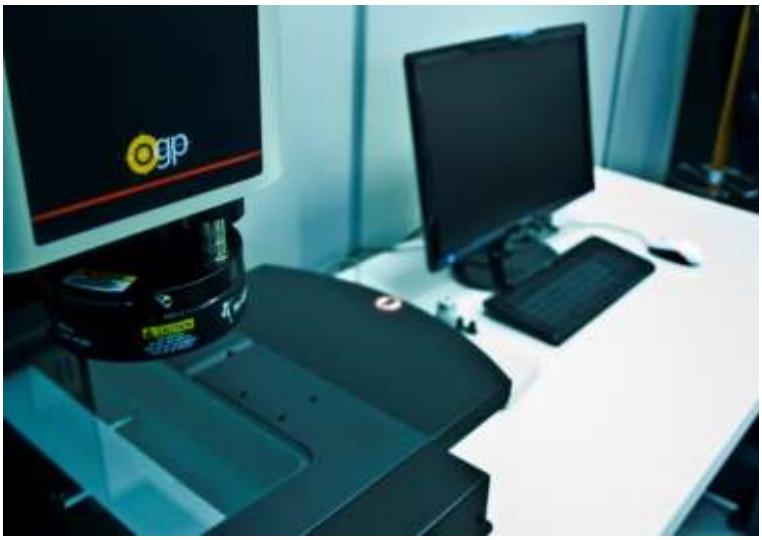
Donadon SDD supply also a wide range of Pressure Relief Valves in order to offer customers an integrated service.

Since January 2008 Donadon SDD is established in a new plant with new production and testing equipment that allow to:

- Ensure maximum quality level
- Develop new models with advanced technology
- Offer a very high level service(customized orders delivered in 2 weeks and rush spare parts orders in a few days)
- Increase production capacity in line with market requirements
- Continue to quote very competitive prices

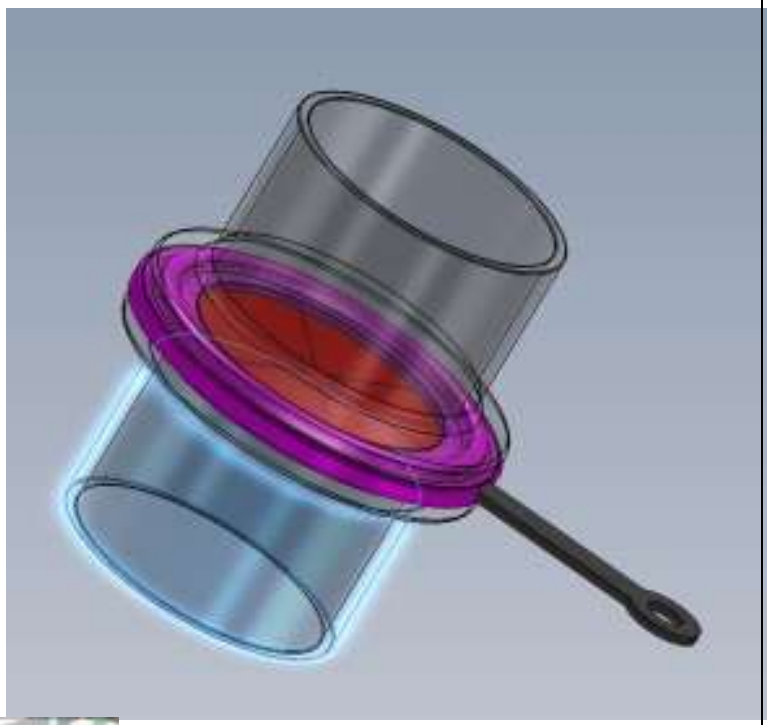
In following years Donadon SDD has continued to invest in development of new manufacturing technologies and especially in production with a totally laser based process of the new NS nanoscored rupture disc series. This process is a breakthrough innovation positioning Donadon SDD on the world front line of rupture disc technology. Donadon SDD has also invested in new up to date manufacturing

equipment and modern development and measurement tools like Solidworks drawing equipment and an OGP microscope able to measure and take picture with 1 micron definition.



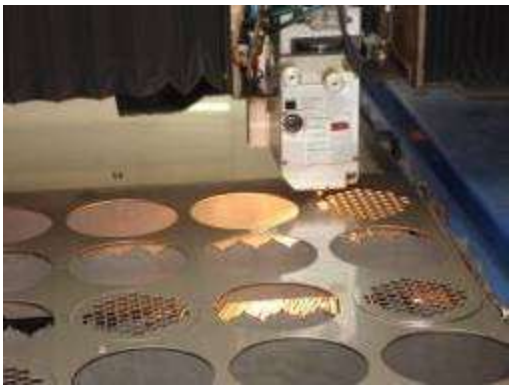
Rupture pressure of discs may vary from 5 millibar up to 4000 bar, taking also into account size and material. Testing equipment allow to certify discs up to DN 900 and to perform testing both at low temperature (down to -196°C) and at high temperature (up to 500°C).

Organization and procedures are designed to ensure reliable manufacturing of high quality products in compliance with ISO 9001-2000 standard. Products are certified according to European Directive 97/23/CE (PED) and European Directive 94/9/CE (ATEX).
Technical and Commercial services are able to support client requirements and develop the best technical and economical solutions.
Compact company organization, fully dedicated to pressure protection equipment, is highly flexible and able to satisfy both specialized requirements and mass-produced products.



Key advantages of Donadon SDD Rupture discs

- **Custom manufacturing according to client specification – Zero manufacturing range**



- **High precision, computer controlled laser manufacturing**
- **Low tolerance also for low bursting pressure**
- **2 – 3 weeks standard delivery**
- **Rush spare parts deliveries in a few days**
- **Full range of diameters and burst pressures**
- **Worldwide deliveries**
- **Competitive pricing**

Technical Service

Model selection for Rupture discs, Explosion vent panels and Rupture indicators

Donadon SDD technical service, taking into account customer's requirements, develops the best technical solution and suggests the most effective model of Rupture disc, explosion vent panel and Rupture indicator

Material selection for Rupture discs, Explosion vent panels and accessories

Donadon SDD offers Rupture discs and accessories in a wide range of materials and is able to suggest the materials with best compatibility with process fluids

Sizing

Donadon SDD supports customers in sizing Rupture discs and Explosion vent panels according to the equations specified in the relevant international standards. However the customer is responsible for defining the correct parameters to use in the calculation**.**

Special executions

Donadon SDD technical service is available to develop the most convenient solutions for non standard requirements.
Donadon SDD is also available design and fabricate special parts in cooperation with customers.

Rupture Discs as Safety Devices

Chemical plants, tanks, reactors, silos and any other equipment working under pressure may be damaged or destroyed by non-controlled pressure rises.

Protection of personnel and equipment from this risk is achieved with safety devices that provide an adequate fluid outlet, venting the excess pressure.

In the same way protection from depression is achieved.

Rupture discs and relief valves are the safety devices used more frequently. Their design and performance are widely different but both types protect the equipment from high pressure. The rupture disc (or bursting disc) is a very versatile device and is extremely useful at very low and very high running pressure, in contact with toxic or expensive fluids when leaks are not allowable.
It is a very reliable device without maintenance problems notwithstanding its low cost.

Rupture discs and Pressure safety valves

Main properties of the two devices are compared in the following table

EQUIPMENT	RUPTURE DISC	SAFETY VALVE
Type of device	Simple	Mechanical
Mounting position	Any position	Only vertical
Behaviour when overpressure ceases	It does not re-close the disc must be replaced	It closes again
Does it give protection from overpressure	Yes	Yes
Does it give protection from vacuum	Yes	No
Periodical check of calibration	Not required	Required
Is it possible to change calibration	No	Yes
Calibration lower than 0.1 bar	Yes	No
Calibration higher than 500 bar	Yes	No
Availability of diameters	Large selection	Limited
Availability of materials	Large selection	Limited
Maintenance	Minimum	High
Costs	Minimum	High
Leaks during operation	No	Possible

Rupture discs and safety valves may be used independently as primary safety devices or in conjunction.
Possible combinations are:
Rupture disc and Safety valve in parallel: rupture disc is a second level of protection (usually set at a pressure slightly above that of the valve). Typical application: protection of liquefied gas tanks.
Rupture disc downstream the valve: The disc shields the valve from corrosive fluids eventually present in the discharge duct
Rupture disc upstream the valve: This solution combines the positive properties of both devices: leak tight seal of the disc and re-closure of the pressure relief valve. In addition the disc protects the valve from corrosive or scaling products and reduces the maintenance requirement of the more expensive and sensitive equipment. Key advantages are:

- Protect the valve from corrosive or scaling products
- Avoid leakage due to corrosion or scaling of valve seat (very important for dangerous fluids)
- Reduce valve maintenance cost (cleaning and calibration)
- Possibility to test the correct performance of the valve without shutting down the plant and dismounting the valve.

The disc is normally set at the same pressure as the valve; pressure build up in the space between the two devices must be monitored and avoided by providing a venting port

Rupture disc models

Rupture discs belong to 3 families:

- Metal
  - Conventional or forward acting
  - Compression or reverse acting
- Graphite.

Disc selection depends from exercise conditions of the equipment to be protected:

- Conventional discs have a flat or concave surface exposed to the pressure. Bursting happens when the pressure (or depression) overcomes the mechanical resistance of the material, after having gradually increased the camper of the disc.
- Reverse acting discs have a convex surface exposed to the pressure. The shape of the disc does not change until the pressure reaches the bursting point.
- Graphite discs are recommended at low exercise pressure in contact with aggressive fluids. They are normally used at low and medium pressure.

Minimum and maximum bursting pressures are dependent from:

- Disc model
- Dimension
- Material

Minimum and maximum working temperatures are dependent from disc material as in following table

Rupture Discs

Material	Maximum temperature °C	Minimum temperature °C
Stainless Steel AISI 304	280°C	-196°C
Stainless Steel AISI 304L	280°C	-196°C
Stainless Steel AISI 316	315°C	-196°C
Stainless Steel AISI 316L	315°C	-196°C
Stainless Steel AISI 321	315°C	-196°C
Nickel 200	400°C	-196°C
Monel 400	427°C	-196°C
Inconel 600	427°C	-196°C
Hastelloy C276	480°C	-196°C
Titanium	300°C	-60°C
Copper	200°C	-10°C
Aluminium	260°C	-10°C

Working temperature of discs with a lining is also dependent from lining material

Membranes

Material		USE LIMITS	
Typo	Code	T max.	T min.
Polymer	PTFE	260°C	---
"	FEP	204°C	---
"	MYLAR	110°C	---
Stainless Steel	ASTM A 240 316L	315°C	-196°C
Aluminium	ASTM B 209	260°C	-10°C
Copper	ASTM B 569	200°C	-10°C

Rupture discs DONADON NS NanoScored series

Donadon SDD introduces the new rupture discs series NS NanoScored, a further development of its breakthrough technology for manufacturing scored rupture discs.
The NS NanoScored rupture discs series includes forward acting rupture discs (tension) like Donadon SCD/NS and reverse acting rupture discs (compression) like Donadon SCR/NS (6 or more petals) and Donadon Y90/NS (opening on perimeter).
Rupture discs of NS Nanoscored are fully metallic and adequate for all applications.

Main advantages are:

- Accuracy
- Reliability
- Non fragmenting even at high bursting pressure
- Low bursting pressure (less than 0.5 barg – 7 psig) also for DN 25 (1")
- Available from DN 10 up to DN 600 (24")
- Material flexibility: stainless steel, Nickel, Inconel, Monel, Hastelloy, Titanium, Tantalum
- Model flexibility
    a. Compression (reverse buckling) with 6 or more radial scores (SCR/NS model)
    b. Compression (reverse buckling) with perimetral score (Y90/NS model)
    c. Tension (forward acting) with 6 or more radial scores (SCD/NS model)
- Standard or sanitary (Tri-clamp) holders
- Standard tolerance +/- 5% on full range
- Reduced tolerance according to customer requirements

The new manufacturing technology developed and patented by Donadon SDD allows to manufacture scored rupture discs also with materials of very low thickness (in practice with every thickness industrially available) ensuring high reliability and strict tolerance
It is therefore possible to extend the range of bursting pressure to lower bursting pressure than normally available.

Rupture disc DONADON NanoScored model SCD/NS

Donadon SCD/NS is a concave rupture disc with a NanoScored calibrated section. Special feature of SCD/NS is scoring in 6 sectors instead of 4 as usual in all competitors' discs.
Opening in 6 petals allows a better opening reducing the risk of petal detachment even at high bursting pressure.
It is used with gas and liquids also in cycling and pulsating conditions without reduction of safety margins.
SCD/NS disc reacts to excessive pressure in a few milliseconds without fragmentation.

It is especially suited for protection of pressure relief valves.
SCD/NS disc may operate at 85% of the bursting pressure and has a very good resistance to corrosion due to the thickness pf the material employed. Corrosion resistance may be additionally improved by PTFE lining.
Vacuum support is normally not required.
Available in special execution certified Ex II 2GD according to European Directive 94/9/CE (ATEX).

Technical Properties

Model	**SCD**
Materials	Stainless Steel, Aluminium, Nickel, Hastelloy, Inconel, Monel, Titanium, Tantalum
Membrane	No
Available dimensions	DN 10 – DN 600
Bursting pressure	0,45 - 80 bar g (function of material and diameter)
Tolerance	from +/- 5 % to +/- 20%
Operating temperature	up to a 480°C
Operating margin	85 %
Holder	HI o AZ 60 with flat or conical seat; sanitary with flat seat
Fragmentation	No
ATEX	Yes
Use in conjunction with safety valve	Yes
Corrosion resistance	Very good
Vacuum support	Available
Rupture indicator	SVT /AT or NAM 03HT or OFI
Linings	Available

Rupture disc DONADON NanoScored model SCR/NS

Donadon SCR/NS is a compression (or reverse) rupture disc with a NanoScored calibrated section. Special feature of SCR/NS is scoring in 6 sectors instead of 4 as usual in all competitors' discs.

Opening in 6 petals allows a better opening reducing the risk of petal detachment even at high bursting pressure.
It is used with gas and liquids also in cycling and pulsating conditions without reduction of safety margins.
SCR/NS disc reacts to excessive pressure in a few milliseconds without fragmentation.
It is especially suited for protection of pressure relief valves.
SCR/NS disc may operate at 90% of the bursting pressure and has a very good resistance to corrosion due to the thickness of the material employed. Corrosion resistance may be additionally improved by PTFE lining.
Vacuum support is normally not required.
Available in special execution certified Ex II 2GD according to European Directive 94/9/CE (ATEX).

Technical Properties

Model	**SCR/NS**
Materials	Stainless Steel, Aluminium, Nickel, Hastelloy, Inconel, Monel, Titanium, Tantalum
Membrane	No
Available dimensions	DN 25 – DN 600
Bursting pressure	0,45 - 80 bar g (function of material and diameter)
Tolerance	from +/- 5 % to +/- 20%
Operating temperature	up to a 480°C
Operating margin	90 %
Holder	Y90
Fragmentation	No
ATEX	Yes
Use downstream a safety valve	Yes
Corrosion resistance	Very good
Vacuum support	Available
Rupture indicator	SVT /AT or NAM 03HT or OFI
Linings	Available

Rupture disc DONADON NanoScored model Y90/NS

Donadon Y90/NS rupture disc is a compression (or reverse) disc peripherally NanoScored..

The Y90 represents high technology in the sector: the camber of the convex disc is not modified by the operating pressure except on reaching reverse pressure. Therefore this device works with ratios of up to 90% between operating and rupture pressure and withstands thousands of cycles without jeopardising its reliability. At the moment of reversion the disc bursts in a few thousands of a second rupturing along the scored line without fragments Y90/NS disc has lower sensitivity to variations in temperature than conventional discs and therefore is very useful in applications with large temperature variations.

It is especially suitable for use with gas and liquids, and for protecting pressure relief valves

The wide choice of materials and the thickness used make the Y90/NS disc very resistant to corrosion. Greater protection can be obtained with a PTFE lining, which can be applied to the process side of the disc.

Vacuum support is normally not required

Available in special execution certified Ex II 2GD according to European Directive 94/9/CE (ATEX)

Technical Properties

Type	**Y90**
Materials	Stainless Steel, Aluminium, Nickel, Hastelloy, Inconel, Monel, Titanium, Tantalum, Copper
Membrane	No
Available dimensions	DN 25 – DN 400
Bursting pressure	0,45 - 70 bar g (function of material and diameter)
Tolerance	from +/- 5 % to +/- 20%
Operating temperature	Up to 480°C
Operating margin	90 %
Holder	HI
Fragmentation	No
ATEX	Yes
Use in conjunction with safety valve	Yes
Corrosion resistance	Very good
Vacuum support	Not required
Rupture indicator	SVT /AT or NAM 03HT or OFI
Linings	Yes

Rupture discs Donadon NS NanoScored for sanitary applications

Donadon NS NanoScored rupture discs are very well suited for application in Pharmaceutical, Food and Biotech industries, for plants with C.I.P. (Clean In Place) and S.I.P. (Steam In Place) technology and productions according to Good Manufacturing Practices (GMP).
Donadon NS NanoScored rupture discs can be installed in Clamp type connectors (Sanitary, Tri-Clamp, etc.) and are completely made of metal (Stainless Steel AISI 316L or other alloys according to customer specifications).

NS NanoScored technology is adequate for manufacturing rupture discs with a wide range of rupture pressure for all diameters.
In many cases Donadon NanoScored discs can be manufactured with built-in full vacuum resistance, without need of vacuum supports.
Very important for many applications is the availability of vacuum resistant rupture discs with rupture pressure minor than 0,5 barg (7 psig) (non-PED applications). This properties can be achieved for diameters down to 1" ½ (DN 40).
Rupture discs Donadon NS NanoScored for Clamp connectors are available both in forward acting (tension) disc models like SCD/NS and in reverse (compression) disc models like SCR/NS and Y90/NS.
Standard gaskets are in FDA approved PTFE

DONADON SCD Rupture Disc

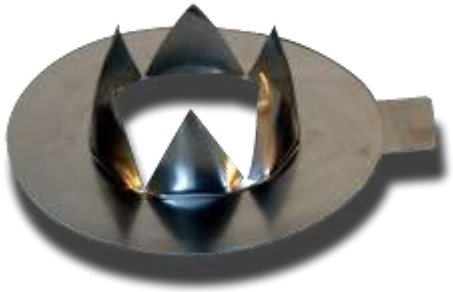
Donadon SCD is a concave rupture disc with micro-scored calibrated section. Special feature of SCD is scoring in 6 sectors instead of 4 as usual in all competitors' discs.

Opening in 6 petals allows a better opening reducing the risk of petal detachment even at high bursting pressure.

It is used with gas and liquids also in cycling and pulsating conditions without reduction of safety margins.

SCD disc reacts to excessive pressure in a few milliseconds without fragmentation.

It is especially suited for protection of pressure relief valves.



SCD disc may operate at 85% of the bursting pressure and has a very good resistance to corrosion due to the thickness pf the material employed. Corrosion resistance may be additionally improved by PTFE lining.

Vacuum support is normally not required.

Available in special execution certified Ex II 2GD according to European Directive 94/9/CE (ATEX).

Technical Properties

Model	**SCD**
Materials	Stainless Steel, Aluminium, Nickel, Hastelloy, Inconel, Monel, Titanium, Tantalum
Membrane	No
Available dimensions	DN 25 – DN 600
Bursting pressure	2 - 80 bar g (function of material and diameter)
Tolerance	from +/- 5 % to +/- 20%
Operating temperature	up to a 450°C
Operating margin	85 %
Holder	HI o AZ 60 with flat or conical seat; sanitary with flat seat
Fragmentation	No
ATEX	Yes
Use in conjunction with safety valve	Yes
Corrosion resistance	Very good
Vacuum support	Available
Rupture indicator	SVT /AT or NAM 03HT or OFI
Linings	Available

DONADON SCR Rupture Disc

Donadon SCD is a compression (or reverse) disc with micro-scored calibrated section. Special feature of SCD is scoring in 6 sectors instead of 4 as usual in all competitors' discs.

Opening in 6 petals allows a better opening reducing the risk of petal detachment even at high bursting pressure.
It is used with gas and liquids also in cycling and pulsating conditions without reduction of safety margins.
SCR disc reacts to excessive pressure in a few milliseconds without fragmentation.
It is especially suited for protection of pressure relief valves.
SCR disc may operate at 90% of the bursting pressure and has a very good resistance to corrosion due to the thickness of the material employed.
Corrosion resistance may be additionally improved by PTFE lining.
Vacuum support is normally not required.
Available in special execution certified Ex II 2GD according to European Directive 94/9/CE (ATEX).

Technical Properties

Model	**SCR**
Materials	Stainless Steel, Aluminium, Nickel, Hastelloy, Inconel, Monel, Titanium, Tantalum
Membrane	No
Available dimensions	DN 25 – DN 600
Bursting pressure	2 - 80 bar g (function of material and diameter)
Tolerance	from +/- 5 % to +/- 20%
Operating temperature	up to a 480°C
Operating margin	90 %
Holder	Y90
Fragmentation	No
ATEX	Yes
Use downstream a safety valve	Yes
Corrosion resistance	Very good
Vacuum support	Available
Rupture indicator	SVT /AT or NAM 03HT or OFI
Linings	Available

DONADON Y90 Rupture Disc

The Y90 DONADON rupture disc is a compression (or reverse) disc peripherally scored.
The Y90 represents high technology in the sector: the camber of the convex disc is not modified by the operating pressure except on reaching reverse pressure. Therefore this device works with ratios of up to 90% between operating and rupture pressure and withstands thousands of cycles without jeopardising its reliability.

At the moment of reversion the disc bursts in a few thousands of a second rupturing along the scored line without fragments
Y90 disc has lower sensitivity to variations in temperature than conventional discs and therefore is very useful in applications with large temperature variations.
It is especially suitable for use with gas and liquids, and for protecting pressure relief valves
The wide choice of materials and the thickness used make the Y90 disc very resistant to corrosion. Greater protection can be obtained with a PTFE lining, which can be applied to the process side of the disc.
Vacuum support is normally not required
Available in special execution certified Ex II 2GD according to European Directive 94/9/CE (ATEX)

Technical Properties

Type	**Y90**
Materials	Stainless Steel, Aluminium, Nickel, Hastelloy, Inconel, Monel, Titanium, Tantalum, Copper
Membrane	No
Available dimensions	DN 25 – DN 400
Bursting pressure	1,3 - 70 bar g (function of material and diameter)
Tolerance	from +/- 5 % to +/- 20%
Operating temperature	Up to 450°C
Operating margin	90 %
Holder	Y90
Fragmentation	No
ATEX	Yes
Use in conjunction with safety valve	Yes
Corrosion resistance	Very good
Vacuum support	Not required
Rupture indicator	SVT /AT or NAM 03HT or OFI
Linings	Yes

DONADON STD Rupture Disc

Donadon STD rupture disc is a conventional concave disc with solid calibrated section.

It is a simple and reliable device used with gas and liquids in cyclic and pulsating conditions

STD discs react to excessive pression in a few thousands of second.

Supports for vacuum and counter-pression are available

Technical Properties

Model	**STD**
Materials	Stainless Steel, Aluminium, Nickel, Hastelloy, Inconel, Monel, Titanium, Tantalum , Copper
Membrane	No
Available dimensions	DN 15 – DN 900
Bursting pressure	6 - 4000 bar g (depending from material and diameter)
Tolerance	from +/- 5 % to +/- 20%
Exercise temperature	Up to 450°C
Operating margin	70 %
Holder	HI or AZ 60 with flat or conical seat; sanitary with flat seat
Fragmentation	Yes
ATEX	No
Use in conjunction with safety valve	No
Corrosion resistance	Very high
Vacuum support	Available
Rupture indicator	SVT / AT
Linings	Available

DONADON DCD Rupture Disc

Donadon DCD rupture disc is a composite conventional disc formed by three parts:

- A slotted, perforated metal part
- A seal membrane (usually in PTFE but also available in many other metallic or non-metallic materials
- A protection section

It is excellent for use with gas and liquids in static conditions and excellent for low pressures.

DCD disc is particularly suitable to be fitted on equipment and systems.

It reacts to over-pressure in a few thousands of a second with total opening and without fragmentation.
DCD disc is therefore recommended for protection of pressure relief valves.
Supports may be provided for protection from vacuum or counter pressure.
DCD disc may also be used for protecting silos or other equipment from vacuum.
Available in special execution certified Ex II 2GD according to European Directive 94/9/CE (ATEX).

Technical Properties

Model	**DCD**
Materials	Stainless Steel, Aluminium, Nickel, Hastelloy, Inconel, Monel, Titanium Copper
Membrane	PTFE, FEP, Mylar, Stainless Steel, Aluminium
Available dimensions	DN 15 – DN 900
Bursting pressure	0,01 – 100 bar g (function of material and diameter)
Tolerance	From +/- 5 % to +/- 20%
Operating temperature	Up to 315°C
Operating margin	80 %
Holder	HI o AZ 60 with flat or conical seat; sanitary with flat seat
Fragmentation	No (membrane only)
ATEX	Yes
Use in conjunction with safety valve	Yes
Corrosion resistance	Good – may be protected with a membrane
Vacuum support	Available
Rupture indicator	SVT /AT or IRP or NAM 03HT or OFI
Linings	Protection membrane or PTFE coating

DONADON DIF Rupture Disc

Donadon DIF rupture disc is a composite conventional disc formed by four parts:

- A slotted, perforated metal part
- A seal membrane (usually in PTFE but also available in many other metallic or non-metallic materials
- A protection section
- A calibration ring

This disc has been designed to be mounted between flanges
It is excellent for use with gas and liquids in static conditions and excellent for low pressures.
DIF disc is particularly suitable to be fitted on equipment and systems.
It reacts to over-pressure in a few thousands of a second with total opening and without fragmentation.
DIF disc is therefore recommended for protection of pressure relief valves.
Supports may be provided for protection from vacuum or counter pressure.
DIF disc may also be used for protecting silos or other equipment from vacuum.
Available in special execution certified Ex II 2GD according to European Directive 94/9/CE (ATEX).

Donadon DIF Rupture Disc for double protection

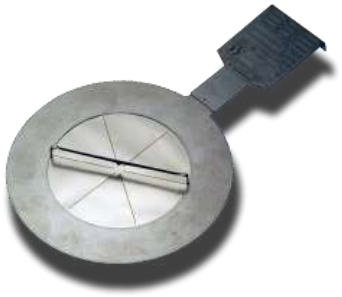
DIF rupture disc can be manufactured in order to protect both from overpressure and from under-pressure. In this case the **DOUBLE DIF** disc is formed by two calibrated discs, one PTFE membrane and two calibration rings. Burst pressure can be the same in both directions or different (within limits to be evaluated taking into account the operating pressure). In this latter case the discharge area of the disc with lower burst pressure is reduced

Technical Properties

Model	**DIF**
Materials	Stainless Steel, Aluminium, Nickel, Hastelloy, Inconel, Monel, Titanium Copper
Membrane	PTFE, FEP, Mylar, Stainless Steel, Aluminium
Available dimensions	DN 15 – DN 900
Bursting pressure	0,01 – 5 bar g (function of material and diameter)
Tolerance	from +/- 5 % to +/- 20%
Operating temperature	Up to 315°C
Operating margin	80 %
Holder	Not required (directly mounted between flanges)
Fragmentation	No (membrane only)
ATEX	Yes
Use in conjunction with safety valve	Yes
Corrosion resistance	Good – may be protected with a membrane
Vacuum support	Available
Rupture indicator	SVT /AT or IRP or NAM 03HT or OFI (with spacer)
Linings	Protection membrane or PTFE coating

DONADON LPD Rupture Disc

Donadon LPD rupture disc is a composite conventional disc formed by four parts:



- A slotted, perforated metal part
- A seal membrane (usually in PTFE)
- A protection section
- A calibration ring with blades to improve membrane opening

Designed to protect processing and storage tanks, atmospheric vessels and silos against implosion or overpressure conditions
It reacts to over-pressure with total opening and without fragmentation.
LPD discs are a simple, reliable, accurate and economical solution for applications requiring extremely low positive and/or negative pressure protection.
A specially interesting application is in the protection of biogas digesters.
Their primary use is in storage tanks with low design pressures in applications where contamination is unacceptable.
Donadon SDD model LPD discs offer non-fragmenting opening and avoid product contamination. The disc will attain full relief within 1 second from the start of rupture and allows for instantaneous system relief at ultra low pressures.
LPD discs may be installed directly between flanges avoiding the requirement for holders with blades and can be offered to meet a broad range of non standard specifications and applications.
LPD discs can be provided with:

- Dual protection (vacuum / pressure)
- Vacuum / counter-pressure support
- Burst detector, ATEX approved, giving immediate indication of burst occurrence

Technical Properties

Model	**LPD**
Materials	Stainless Steel, Aluminium, Nickel, Hastelloy, Inconel, Monel, Titanium, Copper
Membrane	PTFE
Available dimensions	DN 50 – DN 900
Bursting pressure	5 – 500 millibar g (function of material and diameter)
Tolerance	from +/- 10 % to +/- 25%
Operating temperature	Up to 260°C
Operating margin	80 %
Holder	Not required (directly mounted between flanges)
Fragmentation	No (membrane only)
ATEX	Yes
Use in conjunction with safety valve	Yes
Corrosion resistance	Good
Vacuum support	Available
Rupture indicator	OFI (with spacer)
Linings	Yes

DONADON TCD Rupture Disc

Donadon TCD rupture disc is a composite conventional disc formed by four parts:

- A slotted, perforated metal part
- A seal membrane (usually in PTFE but also available in many other metallic or non-metallic materials
- A protection section
- A calibration ring

This disc has been designed specifically to be mounted on rail or road tankers transporting liquids or gases in static or pulsating conditions.
It reacts to over-pressure in a few thousands of a second with total opening and without fragmentation.
TCD disc is therefore recommended for protection of pressure relief valves.
Supports may be provided for protection from vacuum or counter pressure.
Available in special execution certified Ex II 2GD according to European Directive 94/9/CE (ATEX).

Technical Properties

Model	**TCD**
Materials	Stainless Steel, Aluminium, Nickel, Hastelloy, Inconel, Monel, Copper
Membrane	PTFE, FEP, Mylar, Stainless Steel, Aluminium, Copper
Available dimensions	DN 50 – DN 65 – DN 80
Bursting pressure	3,75 and 4,84 bar g at 20°C
Tolerance	From +/- 5 % to +/- 20%
Operating temperature	Up to 450°C
Operating margin	80 %
Holder	HI o AZ 60 with flat or conical seat; sanitary with flat seat
Fragmentation	No (membrane only)
ATEX	Yes
Use in conjunction with safety valve	Yes
Corrosion resistance	Good – may be protected with a membrane
Vacuum support	Available
Rupture indicator	SVT /AT or NAM 03HT or OFI (with spacer)
Linings	Protection membrane

DONADON SU Sealed Units

Sealed Units Donadon SU are formed by a threaded connector containing a calibrated rupture disc
This unit has been designed in order to make easy and reliable mounting small discs in plant environment and to simplify the handling without need of specialized manpower.
The disc may be soldered to a single piece connector or inserted in a two piece threaded holder (sealed and tested in our factory)
SU sealed units are suitable for use with gases and liquids in static or pulsating conditions.
They react to over-pressure in a few thousands of a second and are recommended for protection of plants, plant equipment and containers

Technical Properties

Model	**SU/T and SU/M**
Materials	Stainless Steel, Aluminium, Nickel, Hastelloy, Inconel, Monel, Copper
Membrane	No
Available dimensions	DN 3 – DN 40
Bursting pressure	20 - 4000 bar g (function of material and diameter)
Tolerance	from +/- 5 % to +/- 20%
Operating temperature	Up to 450°C
Operating margin	80 %
Holder	Included
Fragmentation	Yes
ATEX	No
Use in conjunction with safety valve	No
Corrosion resistance	Very good
Vacuum support	No
Rupture indicator	No
Linings	Yes

ATEX certified rupture discs

Donadon SDD manufactures rupture discs in special executions according to European Directive 94/9/EC (ATEX), certified Ex II 2 GD. Therefore these discs may be used in locations where the presence of explosive atmospheres is probable (locations classified as category 1, 21, 2 and 22).
Rupture discs available in ATEX certified execution are the following models: NanoScored series, SCD, SCR, DCD, DIF, TCD and Y90.
For these applications we recommend the rupture indicators supplied by Donadon SDD and certified according to European Directive 94/9/EC (ATEX).

Linings and Special executions

Donadon SDD offers also a wide range of special executions and linings:

- Fluoropolymer coating of discs and holders
- Holders in reinforced PTFE
- Discs and holders in special materials
- Special executions tangent to external diameter of flanges
- Pre-assembled disc + holder sets
- Tested and certified tightness

In addition Donadon SDD technical service is fully available to customers in order to develop personalized solutions to special requirements

DONADON GM Rupture Disc

The DONADON GM of monoblock graphite rupture disc is versatile and suitable for numerous applications. It may be directly inserted between flanges
Graphite discs are very resistant to aggressive fluids, even at high temperature.
Bursting pressure has low sensitivity to temperature variations.
GM disc is made of high purity graphite impregnated with phenolic resins in order to make the product non porous
Opening is total but with fragmentation.
Vacuum support is required for rupture pressures below 1.7 barg. At higher calibrations the disc is self-supporting.

Technical Properties

Model	**GM**
Materials	Graphite
Membrane	No
Available dimensions	DN 15 – DN 300
Bursting pressure	0,07 – 10 bar g (in function of diameter)
Tolerance	from +/- 5 % to +/- 10%
Operating temperature	Up to 165 °C
Operating margin	80 %
Holder	Included
Fragmentation	Yes
ATEX	No
Use in conjunction with safety valve	No
Corrosion resistance	Good
Vacuum support	Available
Rupture indicator	SVT / AT (with spacer)
Linings	Yes

DONADON GR Rupture Disc

The DONADON replaceable “GR” graphite rupture disc is mounted on a graphite or metal holder.

This disc is versatile and suitable for numerous applications.
It is available in metric measurements and in inches and can be inserted between relative flanges.
Graphite discs are very resistant to aggressive fluids, even at high temperature.
Bursting pressure has low sensitivity to temperature variations.
GR disc is made of high purity graphite impregnated with phenolic resins in order to make the product non porous
Opening is total but with fragmentation.
Vacuum support is required for rupture pressures below 1.7 barg. At higher calibrations the disc is self-supporting.

Technical Properties

Model	**GR**
Materials	Graphite
Membrane	No
Available dimensions	DN 25 – DN 200
Bursting pressure	0,07 – 10 bar g (in function of diameter)
Tolerance	from +/- 5 % to +/- 10%
Operating temperature	Up to 165 °C
Operating margin	80 %
Holder	GR
Fragmentation	Yes
ATEX	No
Use in conjunction with safety valve	No
Corrosion resistance	Good
Vacuum support	Available
Rupture indicator	SVT / AT
Linings	Yes

DONADON GA Rupture Disc

The DONADON replaceable GA graphite rupture disc is mounted on a Stainless steel (or other metal) ring and may be directly inserted between flanges.
This disc is very versatile because has both the robustness of a metal holder and the performance of a graphite disc (very resistant to aggressive fluids, even at high temperature, low sensitivity of bursting pressure to temperature variations)

It is available in metric measurements and in inches
GA disc is made of high purity graphite impregnated with phenolic resins in order to make the product non porous
Opening is total but with fragmentation.
Vacuum support is required for rupture pressures below 1.7 barg. At higher calibrations the disc is self-supporting.

Technical Properties

Model	**GA**
Materials	Graphite
Membrane	No
Dimensions	DN 25 – DN 300
Rupture pressure	0,07 – 13 bar g (function of diameter)
Tolerance	from +/- 5 % to +/- 10%
Operating temperature	Up to 165 °C
Operating ratio	80 %
Holder	Included
Fragmentation	Yes
ATEX	No
Downstream a PSV	No
Corrosion resistance	Good
Vacuum support	Available
Rupture indicator	SVT / AT
Linings	Yes

Holders

Donadon holders are designed in order to ensure maximum performance and reliability to Donadon rupture discs

Models designed to be mounted between flanges (HI, Y90 e GR) have

- internal diameter sized in order to allow full opening of the disc and total availability of the minimal discharge area;
- external diameter tangent to the bolts in order to centre easily the holder between the flanges

Reverse acting discs model SCR/NS, Y90/NS, SCR, and Y90 are installed in holders sized in order to protect the dome of the disc and allow full opening of the disc. Standard materials are: Carbon steel, Stainless steel, Nickel, Monel, Inconel, Hastelloy. Special executions are available in Titanium or Tantalum and with PTFE lining or glass fibre reinforced PTFE.

All holders ha two stainless steel assembly plates

AZ 60 holder is designed to be fitted directly on the piping; it is composed by two flanged parts, complete with steel bolts and may have various kinds of couplings can be fitted to its end:

- male and female threaded NPT or Gas
- butt welding
- socket welding

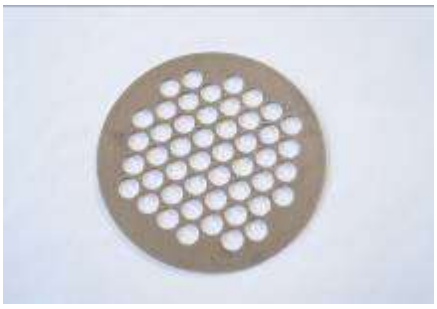
Sanitary holder (Clamp) in stainless steel with high accuracy internal finishing (<0,6 Ra) allows minimum particle contamination, low turbulence and low pressure loss. It is recommended for food, milk, cosmetics and pharmaceutical industries.

GR holder in graphite is designed for the GR replaceable graphite discs

Technical Properties

Type	**Disc**	DN	PN	Seat	Accessories
HI	SCR/NS, SCD/NS, Y90/NS, SCD, SCR, Y90, STD,DCD, TCD,	15 - 900	6 - 160	Flat or conical	Nipples, T connectors, excess flow valve
AZ60	SCR/NS, SCD/NS, Y90/NS, SCD, SCR, Y90, STD,DCD	6 - 100	Up to 400 bar	Flat or conical	Nipples, T connectors, excess flow valve
GR	GR	25 - 200	6 - 10	Flat	- 32
Sanitary	STD, SCD, DCD		6	Flat	-

Vacuum and Counter-pressure Supports



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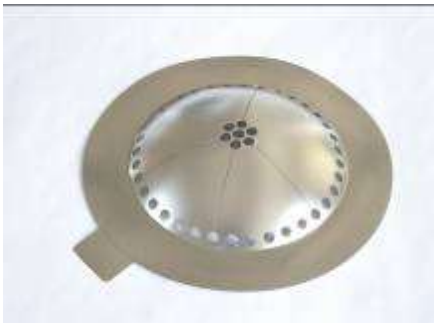

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When the rupture disc may be subjected to conditions of vacuum or counter-pressure a support of adequate design and resistance may be required

Selection of support type is guided by disc type and operation conditions

Vacuum / counter-pressure supports supplied by Donadon SDD are of 5 types

1. Flat grid
2. Convex grid
3. Finned
4. Slotted in sectors
5. Slotted along the circumference

Technical Properties

Type	Grid	Finned	Slotted
Materials	Stainless steel, Nickel, Hastelloy, Inconel, Monel.		
Dimensions	15 - 900	32 - 400	15 - 800
Opening	Reduced	Reduced	Total

PS/R e PS/C type explosion vent panels

Donadon PS/R (rectangular) and PS/C (circular) explosion vent panels are composite tension panels composed of three parts:

- A slotted, perforated metal part
- A seal membrane (usually in PTFE)
- A protection section

In addition vacuum support is available

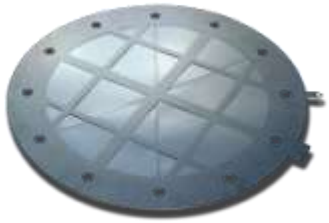
Suitable for use with gas in static, pulsating and cyclic conditions.

PS explosion vent panels are available in square, rectangular or circular models. They usually have very low vent or vacuum pressures.

PS/R and PS/C explosion vent panels are mainly fitted to dust manifolds, dryers, troughs, silos, separators, mixers, boosters, air filters and sieves.

They can be fitted between welded frames or non-machined profiles in carbon or stainless steel. Machined frames or expensive holders are not necessary.

Explosion vent panels may be supplied in ATEX execution, certified Ex II D, Ex II GD and Ex II 2 GD. Therefore may be installed in locations with presence of explosive atmospheres (locations classified as category 0,20, 1, 21, 2 and 22) according to European Directive 94/9/EC (ATEX).



Explosion vent panels available in ATEX certified execution are both the rectangular (PS/Ex/R) and circular (PS/Ex/C) models

For these applications we recommend the intrinsic safety alarm system IRP certified Eex ia IIC T6 according to European Directive 94/9/EC (ATEX).

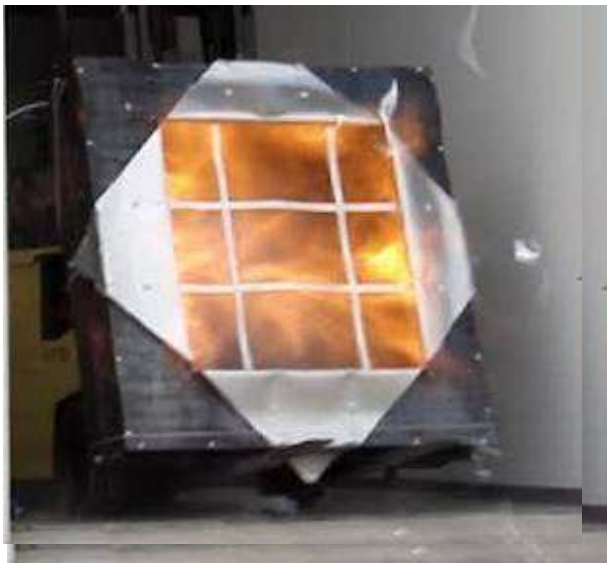
Standard Technical Properties

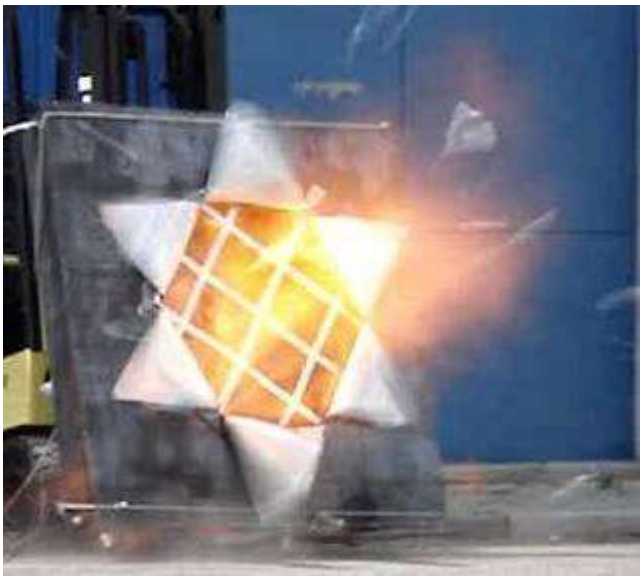
(Other dimensions, materials, and rupture pressures on request)

Model	**PS/R e PS/C**
Materials	Stainless steel
Membrane	PTFE
Dimensions	PS/R: Min: 300x300 - Max: 1120x1120 PS/C: Min: 250 - Max: 900
Rupture pressure	0,1 bar g
Tolerance	+/- 10 %
Operating temperature	Up to 315°C
operating margin	50 - 70 %
Fragmentation	No (membrane only)
ATEX	Yes
Corrosion resistance	Good – may be protected with a membrane
Vacuum support	Available
Alarm system	IRP
Linings	Protection membrane

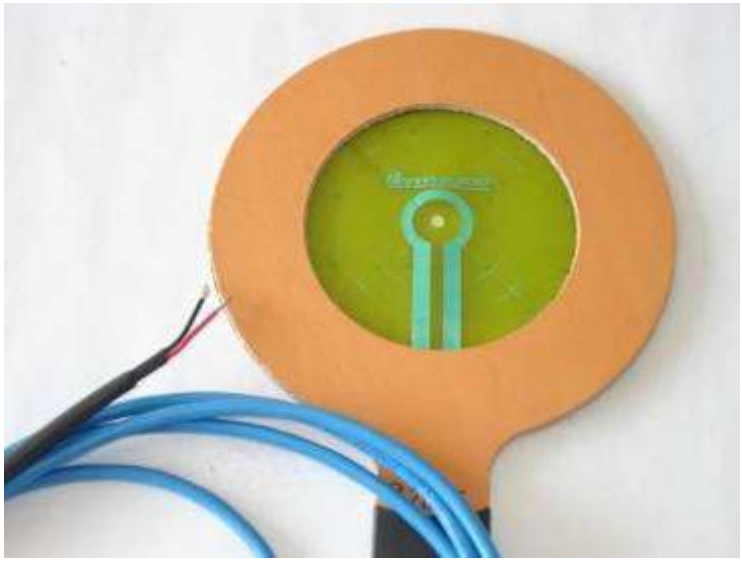
ATEX certified explosion vent panels

Donadon SDD manufactures venting panels in special executions according to European Directive 94/9/EC (ATEX), certified Ex II D, Ex II GD and Ex II 2 GD. They may be used in locations with presence of explosive atmospheres (locations classified as category 0,20, 1, 21, 2 and 22) according to European Directive 94/9/EC (ATEX).
Both rectangular venting panels (PS/Ex/R) and circular venting panels (PS/Ex/C) are available in ATEX certified execution
For these applications we recommend the intrinsic safety alarm system IRP certified Eex ia IIC T6 according to European Directive 94/9/EC (ATEX).





Donadon SVT/AT rupture indicator



The SVT/AT alarm system is a simple and efficient instrument for recording the bursting of a rupture disc.

The detector is installed between the container on the discharge side and the flange down stream from the safety device replacing the traditional seal.

The cables of the alarm system must be connected to the plant's safety system with an intrinsically safe barrier adequate to the sensor (max tension 24 AC/DC and max current 150 mA) and the hazardous area classification.

When the disc bursts the silver circuit of the SVT/AT alarm system is destroyed and as a result of this the flow of current is cut off, allowing the connected equipment to signal that the disc has opened.
The SVT/AT alarm system is classified as "basic electrical material" and is certified according to European Directive 94/9/EC (ATEX).
It may be installed in zone 0; 20 and 1; 21 and 2; 22 if connected to a barrier certified Eex ia or in zone 1; 21 and 2; 22 if connected to a barrier certified Eex ib

Technical Properties

Nominal diameter		DN 25 - 600
Minimum pressure:	DN 25-40-50 DN 80 DN 100 from DN 150 to DN 600	0,3 bar 0,2 bar 0,1 bar 0,07 bar
Thickness		5 mm
Temperature		From -40 to +200°C
Seals		Asbestos free
Membrane		Polyimide
Printed circuit		Silver
Resistance Max		20 OHM
Voltage Max		24 V AC/DC
Intensity Max		150 mA
Cable length		2 meters, bipolar, shielded

Donadon IRP Rupture Indicator

The IRP alarm system is a simple and efficient instrument for recording the bursting of an explosion venting panel

The detector is installed during manufacturing of the explosion venting panel and has a 2m shielded cable

The cables of the alarm system must be connected to the plant's safety system with an intrinsically safe barrier adequate to the sensor (max tension 24 AC/DC and max current 150 mA) and the hazardous area classification.

When the panel bursts the silver circuit of the SVT/AT alarm system is destroyed and as a result of this the flow of current is cut off, allowing the connected equipment to signal that the safety device has opened.
The IRP alarm system is classified as "basic electrical material" and is certified according to European Directive 94/9/EC (ATEX).
It may be installed in zone 0; 20 and 1; 21 and 2; 22 if connected to a barrier certified Eex ia or in zone 1; 21 and 2; 22 if connected to a barrier certified Eex ib
the installation must be according to EN 60079-14 Standard

Technical Properties

Temperature	From -40°C up to +200°C
Membrane	Polyimide
Circuit	Copper
Resistance Max	20 Ohm
Voltage Max	24 V DC/AC
Intensity Max	150 mA
Cable length	2 meters bipolar shielded

Donadon NAM 03/HT Magnetic Alarm System

Donadon NAM 03/HT alarm system is recommended for installation with Donadon SDD rupture discs.
NAM 03/HT Alarm System made of:

- A proximity type sensor installed in the disc holder downstream the disc in order to detect the bursting of the disc.
- a target with a permanent magnet supplied with the disc

When the disc bursts the magnet is displaced and the sensor activated.
Replacement discs are supplied with a new target.

NAM 03/HT is an intrinsic safety device certified ATEX II 2GD Eex m IIC T4/T6 and ATEX II 1GD Eex ia II T3/T6 and therefore may be used in locations where potentially explosive atmospheres with gas, steam or mist are continually present (locations classified zone 0; 20 and 1; 21 and 2; 22 by European Directive 94/9/EC (ATEX)). Barrier type must be adequate to the zone:

- barrier Eex ia > zone 0; 20; 1; 21; 2; 22
- barrier Eex ib > zone 1; 21; 2; 22

NAM 03/HT is normally supplied with 2 meters of bipolar cable C2 class protection grade IP67.
The cables of the alarm system must be connected to the plant's safety system through an intrinsic safety barrier adequate to the location.

Technical Properties

Model	**NAM 03/HT**
Fit for discs of nominal diameter	Minimum DN 25
Minimum / Maximum temperature	Min -20°C / Max +200 °C
Materials in contact with process fluid	Same as disc and disc holder
Max. switching power	10W – 12 VA
Max. switching voltage	60 VDC
Max. switching current	0,4 A
Encapsulating resin	silicone
Electrical cable	2 meters, bipolar
Protection degree	IP 67

Donadon NAM 05 Inductive Alarm System

Donadon NAM 05 alarm system is recommended for installation on Rupture discs and explosion vent panels.

NAM 05 Alarm System is made of:

- an inductive proximity sensor installed downstream the disc or panel
- a target supplied with the disc or panel

When the disc or panel opens the target is moved and the sensor sends a signal to the plant safety system.
Spare discs or panels are supplied with a new actuator
NAM 05 is an intrinsic safety device certified Atex II 1G Eex ia IIC T6 and ATEX II 1D Ex iaD 20 T 108 °C therefore may be used in locations where potentially explosive atmospheres are probable (locations classified zone 0, 20, 1, 21, 2, 22 by European Directive 94/9/CE (ATEX)).
Barrier must be adequate to the zone:

- barriera Eex ia > zone 0; 20 ; 1; 21; 2; 22
- barriera Eex ib > zone 1; 21; 2; 22

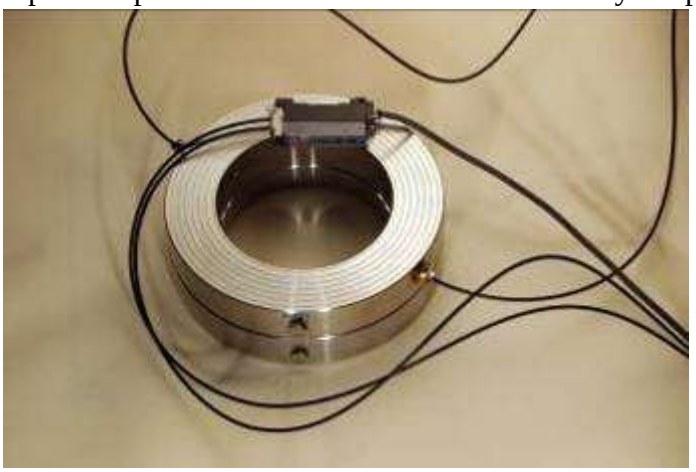
NAM 05 is normally supplied with 2m silicon cable that must be connected to the plant's safety system through an intrinsic safety barrier.

Technical Properties

Model	**NAM 05**
Fit for panels of nominal size	Minimum 200 mm
Maximum pressure on downstream side	2 bar g
Minimum / Maximum temperature	Min. – 25°C / Max +100 °C
Material in contact with fluid (downstream side)	PPS; Ryton R4
Supply voltage	8 VDC
Current consumption	1 – 3 mA
Intrinsic capacitance	36 nF
Intrinsic inductance	43 μH
Cable cross section	0,34 mm
Protection degree	IP 68
Ignition protection	Intrinsic safety

Donadon OFI 04 e OFI 07 Rupture indicators

Optical rupture indicators Donadon OFI are very simple and reliable instruments for detecting bursting of discs



The terminals of the optical fibres are installed in the disc holder and are connected to a signal amplifier

Light transmission is interrupted by the bursting of the disc and a signal is sent to the plant's safety system.

If the amplifier is in an ATEX classified zone 1, 21, 2, 22 must be installed inside an Eexd certified box and fed with DC at 12-24 V through an Eex ia barrier.

There are no electrical or moving parts in contact with the equipment to be controlled and the OFI indicators are not an ignition source

OFI 04 and OFI 07 are not damaged by the bursting of the disc and therefore do not need to be replaced when replacing the discs.

OFI 04 and OFI 07 indicate the bursting of the disc for eventual maintenance / substitution; in case a safety device is required in order to activate other equipment, please contact our Technical Service

Technical Properties

Type	**OFI 04**	**OFI 07**
Temperature	From -55°C to +115°C	From -40°C to +300°C
Optical fibre	Plastic	Glass with steel protection
Minimum bending radius	R25	R23
Supply voltage	12 – 24 VDC	12 – 24 VDC
Current consumption	35 mA max	35 mA max
Feedback time	0,5 msec	0,5 msec
Amplifier box	ABS resin	ABS resin

Pressure Safety Valve + Rupture Disc

Rupture discs and Safety valves may be used independently as primary safety devices or in conjunction.
Possible combinations are:

- Disc and PSV in **parallel**: the disc is a second safety device in order to increase equipment safety (usually the rupture pressure of the disc is slightly above the setting of the valve). Typical application: liquefied gas tanks
- Disc **downstream** a PSV in order to protect the PSV from corrosive chemicals present in the vent duct
- Disc **upstream** a PSV: this solution allows combining the positive aspects of both devices: tightness of the disc and re-closure of the valve. In addition the discs protects the valve from corrosive or scaling process fluids, reducing the maintenance required by the more expensive and sensitive device. Main advantages are:
  - ★ Protection of the valve from aggressive or scaling fluids
  - ★ Avoid leakage due to valve scaling or corrosion (very important for dangerous fluids)
  - ★ Reduce maintenance (cleaning, calibration)
  - ★ Reduce the cost of the valve by using less expensive materials
  - ★ Test the correct performance of the valve without plant shut-down and valve dismounting

  The rupture pressure of the discs is the same of the setting of the valve; build-up of pressure in the space between the disc and the valve must be monitored and avoided