



# INFORMATION BOOK





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## 1 Introduction

The RotaChock® is an adjustable, self leveling and reusable mounting chock that can be used to mount rotating equipment. The RotaChock® is a blend of cutting edge engineering and years of experience to produce a strong, stiff and elegant device to end machinery soft-foot.

### 1.1 RotaChock® Solutions Philosophy

“To design and manufacture the best chocking solution”. In other words: Using the parameters provided by our customers to create a technical and economical solution for a fundamental and core element of machinery installation. Our approach is to segment chocking needs into two directions: new construction and retrofit. For new designs we have a brochure that illustrates the ease of standard RotaChock® installation and economics to suit the end users environment. For the retrofit and fixed design markets we use our core elements to create solutions for each application.

As designers of mechanical chocks we recognize mechanical chocks have physical limitations. Within those boundaries our goal is to offer to the custom the best possible solution. Using mechanical chocks is always the best life cycle decision for rigidly mounted machines because of the adjustability characteristics and reusability. RotaChock® offers the most significant range of options to achieve those goals.





## 2 RotaChock® configuration & design features

### 2.1 General configuration

The basic line of RotaChock® consists of 10 different sized elements ranging from 2" (50,8mm) to 10" (254mm) outside diameter. The maximum load that can be put on a RotaChock® increases with the outside diameter. The foundation bolt runs through the center hole of the RotaChock® clamping the machine foot, the RotaChock® and the top plate of the foundation structure securely together.

The RotaChock® consists of 3 parts;

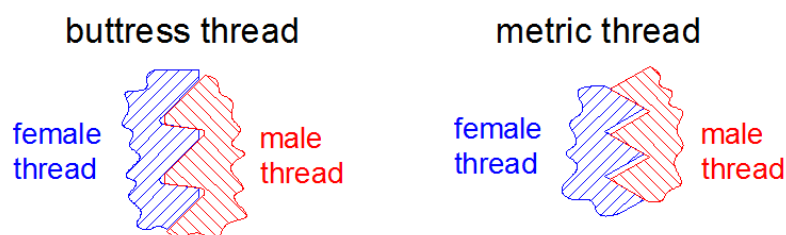
1. A bottom ring with female thread
2. A middle ring with male thread and a concave cavity on top
3. A top ring with a convex surface that lies in the middle ring

Because of the self-locking characteristics of the thread type used in the RotaChock® **there is no need for a mechanical locking device to prevent the RotaChock® parts from rotating under load.**

### 2.2 Thread design

The RotaChock® uses a special thread type called **buttress thread**. Unlike common thread types used in mechanical engineering, buttress thread has a asymmetric design which comprises a 7° top angle and a 45° supporting flank.

As a result of this thread design, the RotaChock® is more mechanically stiff and has a higher load bearing capacity compared to a standard Metric thread of similar diameter and pitch which uses a 2x30° angle design.





## 2.3 Materials

- CS-ACE => Carbon Steel (St52-3 / SAE 1045) –Anti Corrosion Enhanced (stock items)
- SS=> Stainless Steel 316L (available on request)
- AS-ACE => Alloy Steel (42CrMo4 / SAE 4140) (available on request)

### *Mechanical Properties*

Quantity	St52-3 SAE 1045	SS 316L	42CrMo4 SAE 4140	Unit
Young's modulus	210000	200000	210000	MPa
Tensile strength	520 - 620	580 - 650	1000 - 1200	MPa
Yield strength	360	280	550 - 800	MPa
Elongation	22	45	11	%
Fatigue		270		MPa
Impact strength	0.7 - 0.9	140 - 150		J/cm

## 2.4 RotaChock® ACE (Anti- Corrosion Enhanced)

To offer a more cost effective corrosion protection than using Stainless Steel 316, a standard RotaChock® comes with a state of the art coating. This anthracite colored coating is the result of a process called ***nitro carbonizing***.

Nitro Carbonizing process characteristics:

1. High resistance to wear.
2. Excellent scuffing and seizure resistance.
3. Fatigue properties improved by up to 120%.
4. Considerably improved corrosion resistance.
5. Good surface finish.
6. Negligible shape distortion.
7. Predictable growth characteristics.
8. Alloy substitution - Plain carbon steels replacing alloy steels.



After carbonization, the RotaChock elements are further processed by dipping them in a bath of light machine oil which not only provides further protection against corrosion but also ensures a flawless and smooth operation of the moving parts.



### 3 RotaChock® Dimension Chart

P/N	rated load [kN]	OD Ø [mm]	ID Ø [mm]	minimum height [mm]	design height [mm]	maximum height [mm]	standard boltsize M	reduced minimum height [mm]	optional boltsize M	pitch [mm]	weight [kg]
RC2	100	51	17	30	34	38	10/16	23	18	1.6	0,4
RC3	150	76	20	35	42	48	16/18	23	24	1.6	1,1
RC4	200	102	28	40	47	53	20/24	28	30	2.1	2,2
RC4.5	300	114	31	45	53	60	20/27	31	33	2.1	3,1
RC5	400	127	36	50	60	69	28/33	32	39	2.1	4,3
RC6	600	152	41	55	65	74	33/39	37	45	2.1	6,8
RC7	900	178	46	60	68	76	39/45	45	48	3.2	10,1
RC8	1200	203	54	70	81	91	48/52	50	56	3.2	15,3
RC9	1600	229	66	75	84	93	56/60	58	68	3.2	20,7
RC10	2000	254	74	80	89	98	64/68	63	76	4.2	27,3

Explanation:

- P/N: part name
- Rated load: the maximum load that can be safely exerted on the RotaChock®
- OD / Outside Ø: the largest outside diameter of the RotaChock®
- ID / Inner diameter: the diameter of the middle hole of the RotaChock® through which the foundation bolt will pass
- Minimum height: the height of the RotaChock® when it is fully screwed in
- Design height: the height that puts the RotaChock® right in the middle of its adjustable range
- Maximum height: exceeding this height leaves too little threads engaged to safely carry the load
- Standard bolt size: the preferred bolt size that should be used in combination with the chock
- Reduced minimum height: in case the element is too high for the available space, it's possible to reduce the height of the RotaChock® on a lathe. Remember, for every mm you take off, you will also lose 1mm of adjustability range
- Optional bolts size: in case you want to use a larger bolt size than the hole in the chock permits, it is possible to enlarge the hole in the chock to. **Before enlarging the hole, always contact your RotaChock® dealer for a bolt torque calculation.**
- Pitch: the increase in height of the RotaChock® after 1 full revolution





## 4 Contact Information

For all questions about the RotaChock® product line please contact:

Chock Design B.V.  
P.O. Box 121  
2980 AC Ridderkerk  
the Netherlands  
Phone: +31-(0)180 411 290  
Cell: +31-(0)653 244 221  
E-mail: [info@chockdesign.com](mailto:info@chockdesign.com)

or contact a RotaChock® distributor near to you. Since our network is expanding rapidly, please see the distributor page on our website [www.rotachock.com](http://www.rotachock.com) for an up-to-date overview.







## 5 RotaChock® Brochure

The RotaChock® leaflet contains all information needed for making a selection on which size RotaChock® is suitable for a particular application. The size selection is based on the *Rated Load* of the RotaChock®, i.e. the maximum load that can be exerted on the chock during operation including some safety factor (where required).

In case you require a detailed calculation of the various forces that work upon the RotaChock® (weight, bolt tension, torque reaction etc), please contact your RotaChock® dealer for information and a free of charge calculation.



adjustable  
economical  
self leveling  
re-usable



power generation



gas / oil transmission



pump systems

**RotaChock for all rotating machines**  
[www.rotachock.com](http://www.rotachock.com)



P/N	rated load [kN]	OD $\phi$ [mm]	ID $\phi$ [mm]	minimum height [mm]	design height [mm]	maximum height [mm]	standard boltsize M	reduced minimum height [mm]	optional boltsize M	pitch [mm]	weight [kg]
RC2	100	51	17	30	34	38	10/16	23	18	1.6	0,4
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RC5	400	127	36	50	60	69	28/33	32	39	2.1	4,3
RC6	600	152	41	55	65	74	33/39	37	45	2.1	6,8
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RC8	1200	203	54	70	81	91	48/52	50	56	3.2	15,3
RC9	1600	229	66	75	84	93	56/60	58	68	3.2	20,7
RC10	2000	254	74	80	89	98	64/68	63	76	4.2	27,3

#### Configuration options:

tall line  
tall top parts

#### Materials:

carbon steel  
alloy steel  
316L stainless

#### RotaChock ACE, Anti- Corrosion Enhanced

The ACE is a rugged solution for rust problems. We have implemented a new material process to our RotaChock products.

#### Simply the Best!

- Adjustment range
- Minimize installation time
- Simple re-adjustment
- Cost effective
- No soft foot



[www.rotachock.com](http://www.rotachock.com)







## 6 RotaChock® Installation Instructions

A **chock** is the interface between a machine and the structure supporting it. The function of the interface is to create a coplanar surface for the installed machinery. The RotaChock® creates the machinery mounting plane effectively and efficiently.

### Pre-Requisites for Chocking

#### 6.1 System Design

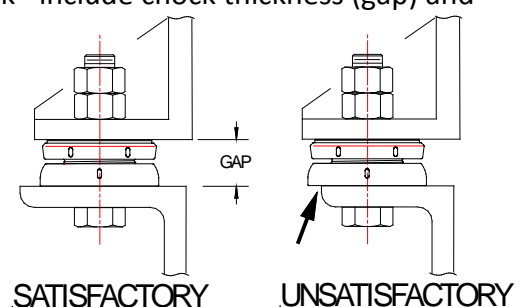
Before considering any chocking system, one must ensure that the foundation is structurally stiff to withstand the static and dynamic loads of the equipment. Don't forget to include any environmental forces from the environment (i.e. pitching and rolling of a vessel)

Each industry has a different consideration for environmental forces i.e. military Grade A shock requirements are vastly different from petrochemical pump systems and the chocking system must meet or exceed the requirements of the application. Defining and understanding these topics are the responsibility of the machine designer, but of course you can always contact us for advice.

System design considerations specific to the RotaChock® include chock thickness (gap) and the support of the bottom part of the RotaChock®.

Step 1) Using the mounting bolt size make a preliminary selection of the RotaChock®. From the RotaChock® brochures select a configuration and nominal design height (gap).

Step 2) Insure the foundation width will accommodate the RotaChock® diameter. The RotaChock® bottom part should be fully supported.





## 6.2 Jacking Devices

Moving the machinery into plumb and/or alignment is most efficiently done by using jacking bolts. There are other techniques such as hydraulic jacks or wedges, but no matter what jacking device is used, it should be clear of the RotaChock®. The design of the package should take in consideration ease of installation, access and the lifecycle of the machinery. RotaChock® is a mounting chock and we recommend not using it as a lifting device.



## 6.3 Machinery Checks

Clean the underside of the machine mounting foot to remove any traces of corrosion, packaging materials, chocking resin residue, paint etc. Also check for dents and other mechanical defects. A thin layer of shot primer is no problem.

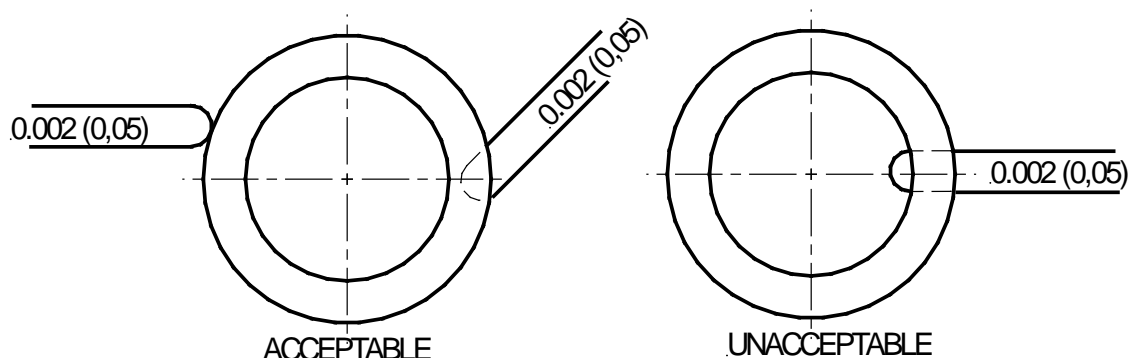
## 6.4 Foundation Checks

Clean the mounting surface and, if painted, check that there is only a light coat (no more than 0.05mm) of primer.

Rocker Check - Position RotaChock® in approximate final location, apply hand load to top of RotaChock® and try to rock the RotaChock® assembly side-to-side. If it rocks, investigate the reason and correct. In most instances the surface preparation is only some local sanding.

A more quantitative check procedure follows but typically the rocker check is adequate.

Feeler Gauge Check – Push down on the RotaChock® and examine the circumference of the bottom part at the foundation with a feeler gauge of 0.05mm (0.002"). The acceptable mounting surface check is achieved when the feeler does not pass completely through the interface area.



## 6.5 Alignment

Accomplish alignment per machine/system target requirements for cold alignment, thermal growth and crankshaft deflections using jacking devices.

Because the RotaChock® is a mechanical device, align the unit 0.05mm or 0.002" above target. The 0.05mm or 0.002" is a nominal dimension to accommodate extrusion of the lubricant in the chock's internal surfaces. There may be some slight variances due to machine load, chock size, foundation surface condition and bolt stretch and we recommend that installers take notes of their equipment alignments to make the next alignment event quicker.

## 6.6 Chock Preparation

Unpack the RotaChock® from its packing tube. The tube is very easy to open and can be closed again air tight by just pressing the lid back on. The chock is covered in light machine oil. You don't need to clean the oil off the chock.





### 6.7 Chock Installation

Place the RotaChock® in position (generally concentric with the bolt hole). Fit the RotaChock® by rotating it counter clock wise (unscrewing) by hand. Using 2 tools tighten each RotaChock®. Once all RotaChocks® have been fitted, remove the vertical jacking screws and install the foundation bolts.



**Note: ALWAYS MAKE SURE THAT ALL JACKING DEVICES HAVE BEEN RELEASED PRIOR TO FOUNDATION BOLT TIGHTENING**

After tightening all foundations bolts to the required torque, check the final alignment. The alignment should be within the cold alignment target tolerances.

### 6.8 Protecting the RotaChock®

The RotaChock® uses a relatively fine thread interface; debris in the thread will make the device hard to adjust. Keep the RotaChock® in its shipping tube until the moment of installation to protect the thread from foreign particles.

The ACE coating on the RotaChock® ensures an extensive protection against corrosion, however, remember that any steel will rust if the circumstances are right (or wrong, for that matter). After installation the RotaChock® can be further protected by paint, tectyl or any other anti-corrosion method as long as care is taken not to allow excess paint entering the threads which would prevent the thread from moving in the future.



## 7 Application Design Instructions for the use of RotaChock®

### 7.1 Selecting the right element size

Choose one of the following methods to select the right RotaChock® size for your application:

#### 1) Bolt Size Method:

Select a RotaChock® based upon the mounting bolt size. For example: M24 Bolt => RC4 (please refer to the hole diameter dimension on the brochure).

#### 2) Basic Chock Calculation Method:

Provide weight, operating characteristics, foot print, gap and bolt size to your RotaChock® dealer. A sizing calculation will be provided free of charge. Also, mind the Designers Notes above.

#### 3) Comprehensive Chocking Plan Method:

Complete the data sheets provided on the subsequent pages (or download the files from our website) and submit them to your RotaChock® dealer. RotaChock® will take care of providing you with a detailed RotaChock® sizing calculation. This method recommends the proper chock size, positioning of chocks, bolting design and bolt torque.

We recommend using this method for all cases where Classification Society approval on the installation is required.

Also use the data sheets for any special environmental applications i.e. High-Shock, Arctic Circle, Nuclear etc...



Whatever method you use to select a RotaChock®, always check the following points:

- The bottom side of the selected RotaChock® should be fully supported by the foundation structure
- At least 75% of the top plate of the chock should be underneath the machine foot
- The bolt-hole to bolt-hole distance of 2 adjacent RotaChock® elements should not be less than the outside diameter of the selected chock
- When designing an installation containing RotaChock® elements, select the proper chock size first and use the “design height” (see the brochure) as a guideline for the gap between the foundation top plate of the foundation and the machine foot.
- In case your application does not accommodate a standard RotaChock® element (e.g. where the available gap height is either too low or too high), please contact your RotaChock® dealer for more information on our special solutions.

## **7.2 RotaChock® load factors**

Various forces will act on the RotaChock® during operation of the machine:

- 1) Weight
- 2) Reaction forces
- 3) Dynamic forces
- 4) Bolt load



### 7.2.1 Weight

The weight of the machine placed on top the RotaChock® results in a force that tries to compress the chock:

$$F_{weight} = \frac{m \times g}{n}$$

where

- $F_{weight}$  = Force as a result of the machine weight acting in Earth's gravity [N]
- $m$  = mass of the machine [kg]
- $g$  = gravitation field strength =  $9.81 \text{ m.s}^2$
- $n$  = total number of RotaChock® elements installed

### 7.2.2 Torque reaction force

Newton's third law states that for every action, there is an equal and opposite reaction. This law applies in rotating systems as well. The angular or rotational analogy of force is called *torque*. In the same way that a linear force can accelerate a mass linearly, a torque can cause the angular acceleration of a mass. The equal and opposite reaction to a torque is called a torque reaction.

The torque reaction force can be calculated by:

$$F_{torque} = \frac{P}{r \times a \times 0.5 \times n} \times \frac{60000}{2\pi}$$

where

- $F_{torque}$  = Force as a result of the reaction torque [N]
- $P$  = power of the machine [kW]
- $r$  = rpm (rotations per minute)
- $a$  = foundation width from bolt hole to bolt hole [mm]
- $n$  = total number of RotaChock® elements installed



## 8 Foundation Bolts

Each industry has its own specifications for bolting, and each manufacturer and customer their own unique bolting preferences.

We use the size, material and style of bolting required by the customer for use in the bolt torque calculations which we provide free of charge. We have time proven solutions which have been used across multiple industries.

### 8.1 Bolt Torque & Stretch

The people behind RotaChock® have over 100 combined years of experience in machinery mounting, which also includes the installation of foundations bolts. The bolt stretch, as a direct result of the torque applied to the bolt or nut during installation, is critical to the life cycle performance of the machine.

The bolt stretch need to be sufficient to accommodate for loss of stretch due to flattening of the surface roughness of the nut, bolt head, foundation interfaces and washers.

Bolt stretch as a result of tension in the bolt can be calculated as:

$$\Delta_l = \frac{l \times F}{E \times A}$$

Where

$\Delta_l$	= bolt elongation [mm]
$l$	= length of the bolt between bolt head & nut or nut-nut [mm]
$F$	= tension in the bolt [N]
$E$	= Young's modulus (210.000 for common steel grades) [MPa]
$A$	= shank area [mm <sup>2</sup> ]

Please call RotaChock® for a free of charge calculation of the required bolt torque and resulting bolt stretch to make sure that your RotaChock® application is tightened in the right manner.

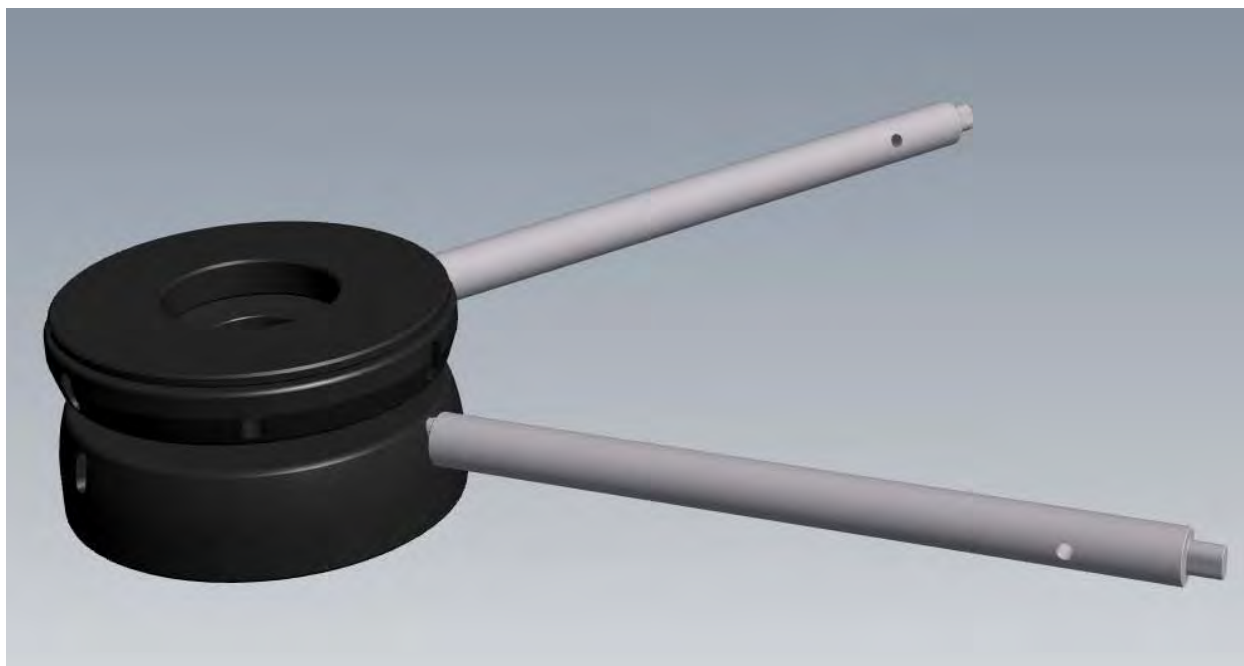




## 9 RotaChock® Adjustment Tools

RotaChock® was designed with ease of installation in mind. RotaChock's slotted holes allow for a large range of tools that can be used for easy adjustment on-site. If no special tools are available when adjustment of a RotaChock® is required, just use a flat screwdriver, chisel, welding rod or dowel pin to do the job.

For cases where larger quantities of RotaChock® elements need to be installed, we developed a range of special adjustment tools that make installation even easier. C-spanners and adjustment bars with a tip matching the slotted holes in the chock are available from your RotaChock® dealer.







## RotaChock Adjustment Tools

Adjusting the RotaChock is a simple task that can be accomplished using a large variety of tools. From years in the field, we have learned that having options is a significant RotaChock advantage. The slots are shown in Illustration 1 below. Tools like: Flat head screw drivers (with tip slightly ground off to provide grip in the slot), chisels, Allen wrenches, dowel pins or similar hand tools accomplish the job. Further, we recognize some technicians like the feel of a spanner. In support of customer inquiries we stock a range of adjusting tools:

RotaChock	Part #
RC2	TB-RC2
RC3	TB-RC3
RC4	TB-RC4
RC4.5	USE - TB-RC5
RC5	TB-RC5
RC6	TB-RC6
RC7	TB-RC7
RC8	TB-RC8
RC9	TB-RC9
RC10	TB-RC10

Other tools:

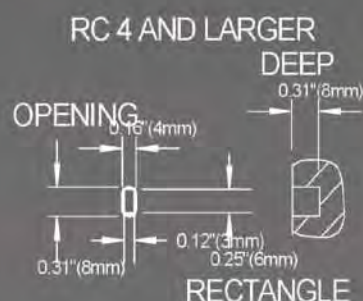
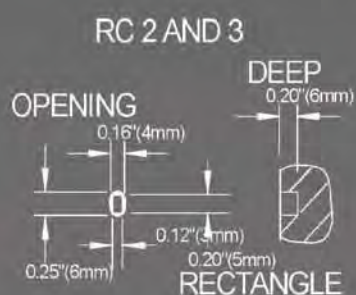


ILLUSTRATION 1

[www.RotaChock.com](http://www.RotaChock.com)



## 10 Material / Product Traceability

All RotaChock® elements are manufactured in an ISO 9001-2008 certified machine shop where modern machines and state of the art measurement tools are used to guarantee a constant high level of quality.

All steel materials used in RotaChock® production are purchased with a 3.1 certificate which ensures that the quality of the batch is according to the certifying party's standard.

All RotaChock® packing tubes are marked to provide the following information:

- RotaChock® size and model  
Model can be:  
[S] – standard  
[RHxx] – Reduced Height xx[mm]
- RotaChock® production batch number in the format  
YY MM Batch#
- Material designator
  - 1 – St52-3
  - 2 – 316L
  - 3 – 42CrMo4
  - 4 – 34CrNiMo6
  - 5 – K-Monel 500

Example:

RC5-RH10-11XXXX-1

Explanation: the box contains a RotaChock® RC5 with a 10mm reduced height, made in production batch xxxx of 2011. The RotaChock® is made out of St52-3.



## 11 FAQ – Frequently Asked Questions

### 11.1 Q. What is a chock?

- A.** A chock acts as the interface between a machine and its foundation structure. A chock should have the following characteristics:
- sufficient load bearing capacity
  - mechanically stiff

### 11.2 Q. What is a RotaChock®?

- A.** A RotaChock® is a mechanical device that is used for chocking all kinds of machinery and equipment. Besides having a very high load bearing capacity and being very stiff, the RotaChock® offers easy & fast installation, permanent re-adjustability, corrosion resistance and competitive pricing.

### 11.3 Q. What are the advantages of RotaChock® over other types of chocks?

- A.**
- 1 - RotaChock® has the highest load rating of all mechanical chocks on the market
  - 2 - Fast & easy installation. The chocking of a 5000kW diesel engine on epoxy cast resin chocks would typically take one or more days to apply the damming material and pour the resin, after which the curing period of 36-48 hours sets in. Then some more hours to remove the damming material and to check that the resin has fully cured, after which the foundation bolts and fitted bolts can be mounted. Altogether a time frame of 3 days at least. By using RotaChock®, the same job can be usually be finished in 1 day!
  - 3 - RotaChock® is permanently re-adjustable. In case the need of realignment arises during the life cycle of the machine, simply loosen the foundation bolts, re-align the machine and re-tighten the bolts.
  - 4 - RotaChock® offers a very cost-effective alternative to other chocking methods due to the very short installation time.

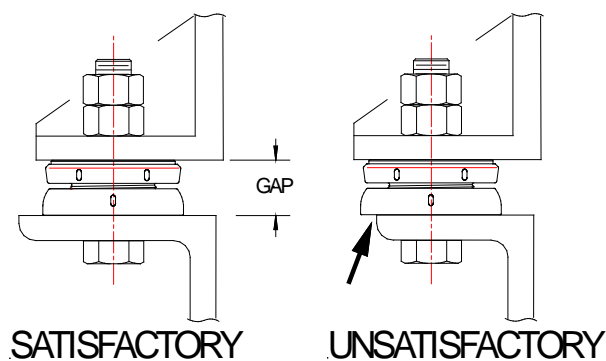


**11.4 Q. When was RotaChock® introduced to the market?**

- A. The first RotaChocks were delivered and installed in 2009. However, the RotaChock® team members have over 100 years of combined experience with all kinds of mechanical chocks. Since 2009 thousands of chocks have been installed under all kinds of equipment in numerous industries and on board vessels.

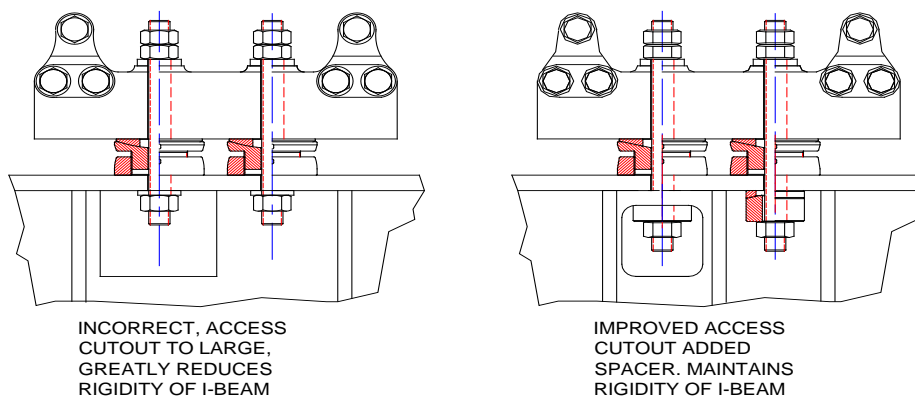
**11.5 Q. How much coverage does the RotaChock® need?**

- A. Insure the foundation width will accommodate the diameter of the RotaChock®. The RotaChock® bottom part should be fully supported.



**11.6 Q. What other considerations need to be taken into account?**

- A. Some installations require cutouts to be made in the I-Beam webs to gain access to the foundation bolts. Below are some illustrations.





**11.7 Q. Do we need special training to work with RotaChock®?**

- A.** No special training is required to do a perfect installation job with RotaChock®. Anyone with even basic mechanical skills will be surprised how easy it is to install RotaChock®!

**11.8 Q. Does RotaChock® have a maximum height limit?**

- A.** The maximum height of any size RotaChock® is stated in our brochure. However, in case the maximum height of the RotaChock® is not sufficient for your application we can supply extended bottom rings or extended top rings. Keep in mind that the maximum height of the chock should never exceed the diameter of the bottom ring.

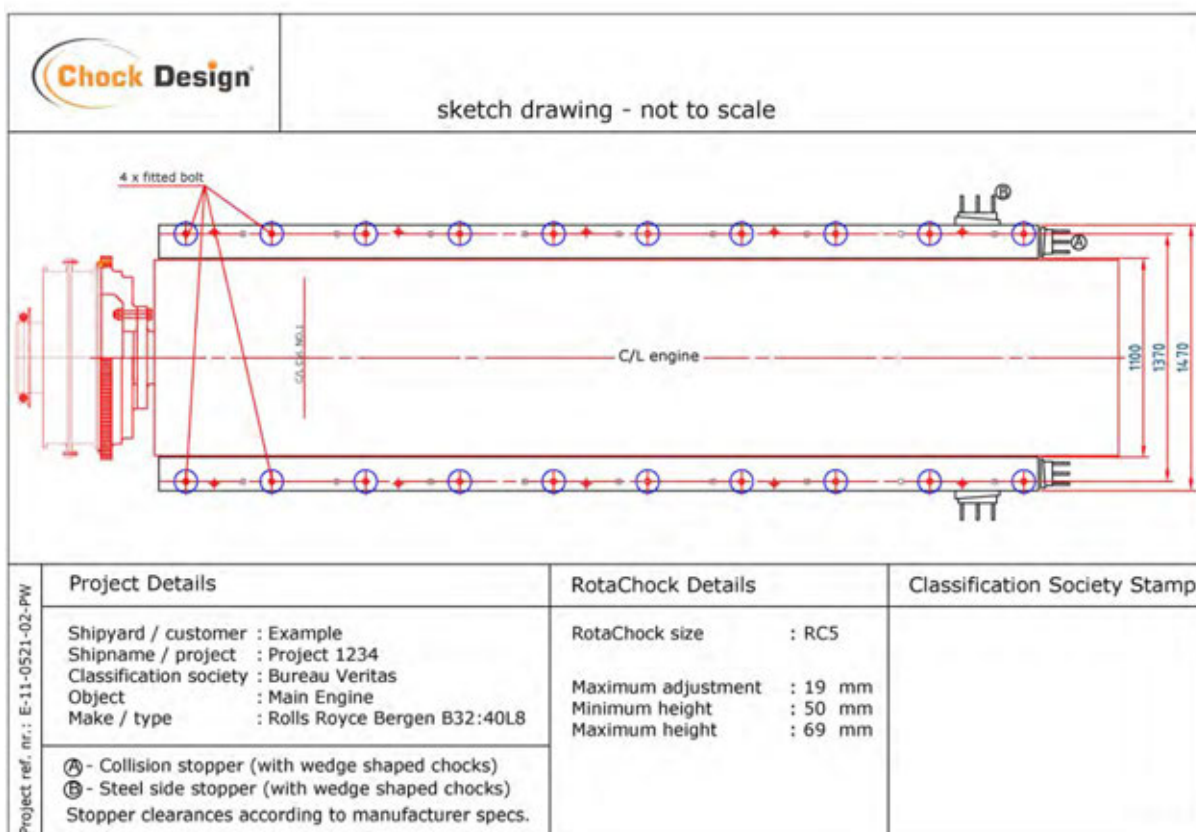
**11.9 Q. What if none of the RotaChock® elements is suitable for my application?**

- A.** In cases where none of our off-the-shelf RotaChock® elements can be used because of load or size limitations, please contact RotaChock® and provide us with all necessary details. Based on our years of experience with alignment and mounting of machinery we'll probably be able to create a special chock for your application that will do the job just right!

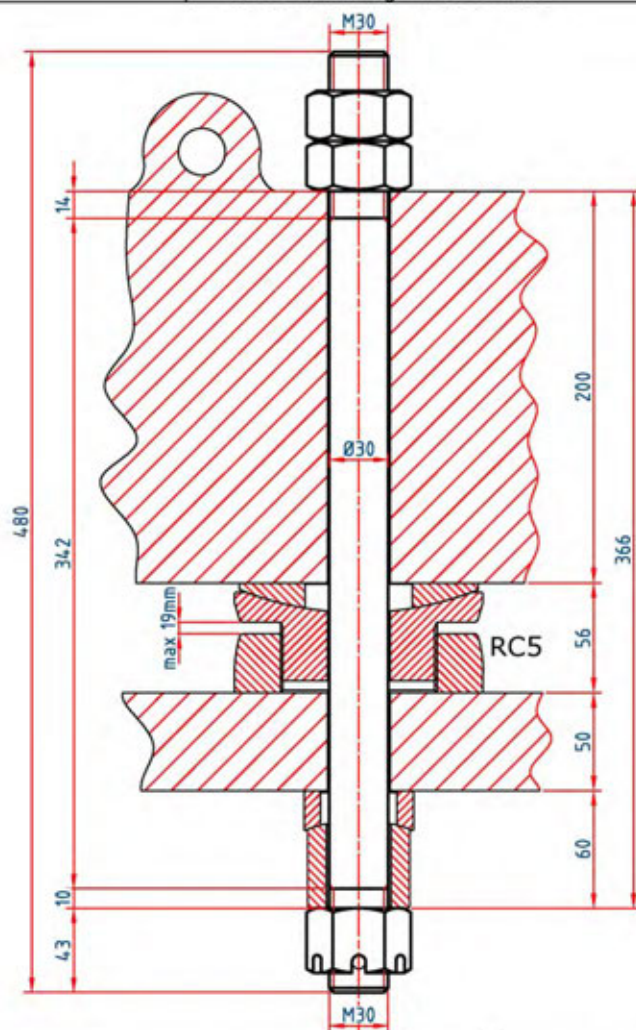
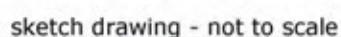




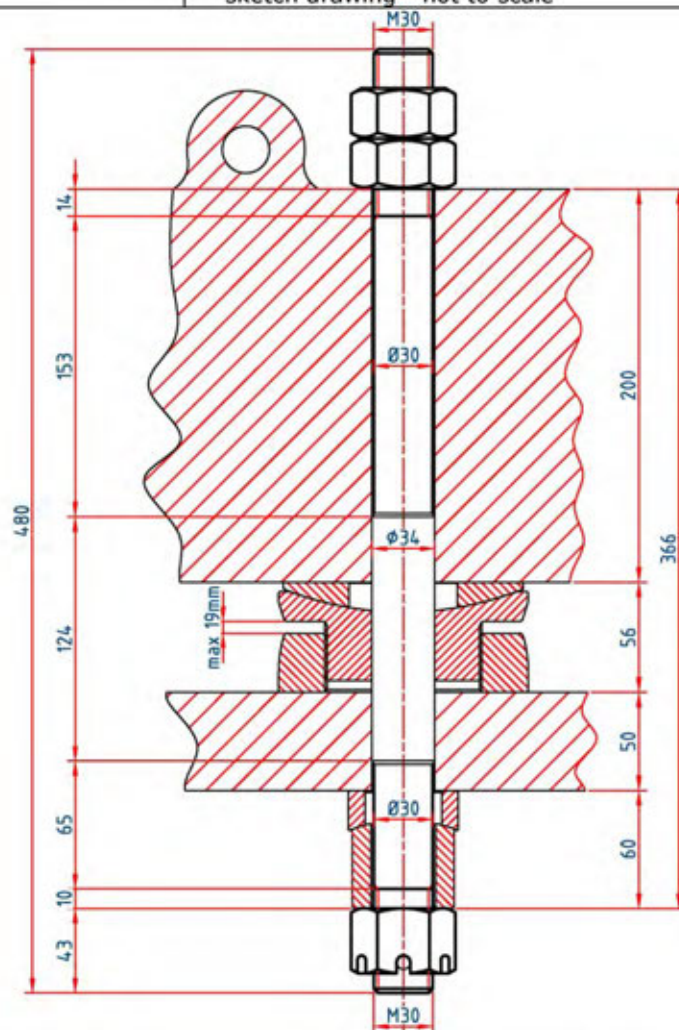
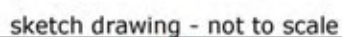
## 12 Calculation Example







Project ref. nr.: E-11-0521-02-PW	Foundation Bolt Details	Classification Society Stamp
	Bolt material : 42CrMo4 Yield strength : 640N/mm2 Size of fitted bolt : M30 x 480mm Stretch : 0.63mm Tightening torque : 1076 Nm Shipyard / customer : Example Shipname / project : Project 1234 Classification society : Bureau Veritas Object : Main Engine Make / type : Rolls Royce Bergen B32:40L8	
	The data presented on this sheet applies to 8.8 grade bolts with Metric thread and coarse pitch, material grade 8.8, yield strength > 640 N/mm <sup>2</sup> . No slide additives should be used on either threads or mating surfaces except for light machine oil.	



Project ref. nr.: E-11-0521-02-PW	Fitted Bolt Details		Classification Society Stamp
	Bolt material : 42CrMo4 Yield strength : 640N/mm <sup>2</sup> Size of fitted bolt : M30 x 480mm Stretch : 0.54mm Tightening torque : 1076 Nm Shipyard / customer : Example Shipname / project : Project 1234 Classification society : Bureau Veritas Object : Main Engine Make / type : Rolls Royce Bergen B32:40L8		
	The data presented on this sheet applies to 8.8 grade bolts with Metric thread and coarse pitch, material grade 8.8, yield strength > 640 N/mm <sup>2</sup> . No slide additives should be used on either threads or mating surfaces except for light machine oil.		



## 13 Type Approvals

RotaChock® has been approved by various Classification Societies which enables the use of RotaChock® underneath propulsion machinery and auxiliary installations on board ships without having to go through a lengthy plan-approval application.

RotaChock® adjustable chocks have been type-approved by:

- Det Norske Veritas (DNV)
- Bureau Veritas (BV)
- American Bureau of Shipping (ABS)
- Germanischer Lloyd (GL)

Pending type approvals:

- Lloyd's Register (LR)
- China Classification Society (CCS)
- RINA

Please check our website [www.rotachock.com](http://www.rotachock.com) for an up-to-date overview of all classification type approvals. Copies of the complete approval documents can be also be downloaded from the website.



### 13.1 Det Norske Veritas (DNV)

		
<h2>DET NORSKE VERITAS</h2>		
<h3>TYPE APPROVAL CERTIFICATE</h3>		
<p>CERTIFICATE NO. M-11555</p>		
<p>This is to certify that the  <b>Adjustable steel chocks for propulsion and auxiliary machinery</b>          with type designation(s)  <b>RotaChock RC size 2 - 10</b></p>		
<p>Manufactured by  <b>Chock Design</b>  <b>Ridderkerk, Netherlands</b></p>		
<p>is found to comply with          Det Norske Veritas' Rules for Classification of Ships/High Speed and Light Craft</p>		
<p>Application  <b>The approval is valid for use as adjustable steel chocks for marine use i.e. for installation of propulsion engines, auxiliary engines and other machinery components.</b></p>		
<p>Hovik, 2010-09-28 for Det Norske Veritas AS</p>  <p><b>Tomas Heber Tronstad</b> Head of Section</p>	 <p>DNV local office: Rotterdam</p>	<p>This Certificate is valid until  <b>2014-12-31</b></p>  <p><b>Hans-Kristian Eriksen</b> Surveyor</p>
<small>This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.          The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.          If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.</small>		
<small>DET NORSKE VERITAS AS, Veritasveien 1, NO-1322 Hovik, Norway, Tel.: +47 67 57 99 00, Fax: +47 67 57 99 11, Org.No. NO 945 748 931 MVA www.dnv.com          Form No.: TA 1411a Issue: October 2009</small>		





## 13.2 Bureau Veritas

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MARINE DIVISION

Certificate number: 23584/A0 BV

File number: ACM 171/306/1

Product code: D020I

*This certificate is not valid when presented without the full attached schedule composed of 7 sections*

www.veristar.com

### TYPE APPROVAL CERTIFICATE

*This certificate is issued to*

**Chock Design B.V.**  
Ridderkerk - NETHERLANDS

*for the type of product*

### CHOCKING DEVICES FOR MACHINERY

RotaChock® RC Series

**Requirements:**

BUREAU VERITAS Rules for the Classification of Steel Ships,  
BUREAU VERITAS Rules for the Classification of Naval Ships,  
BUREAU VERITAS Rules for the Classification of Offshore Units,  
BUREAU VERITAS Rules for the Classification and Certification of Yachts.

*This certificate is issued to attest that BUREAU VERITAS did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.*

**This certificate will expire on: 14 Feb 2016**

For BUREAU VERITAS,  
At BV ROTTERDAM, on 14 Feb 2011.  
Jurriaan GULJE




This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with BUREAU VERITAS. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of BUREAU VERITAS Marine Division available on the internet site [www.veristar.com](http://www.veristar.com). Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against BUREAU VERITAS for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

BV Mod. Ad E 530 May 2009

This certificate consists of 3 page(s)



### 13.3 American Bureau of Shipping

Certificate Number: 10-HS643780-PDA



**Confirmation of Product Type Approval 03/FEB/2011**

Please refer to the "Service Restrictions" shown below to determine if Unit Certification is required for this product.

This is to certify that, pursuant to the Rules of the American Bureau of Shipping (ABS), the manufacturer of the below listed product held a valid Manufacturing Assessment (MA) with expiration date of 10/JAN/2016. The continued validity of the Manufacturing Assessment is dependent on completion of satisfactory audits as required by the ABS Rules.

And; a Product Design Assessment (PDA) valid until 30/NOV/2015 subject to continued compliance with the Rules or standards used in the evaluation of the product.

The above entitle the product to be called Product Type Approved.

The Product Design Assessment is valid for products intended for use on ABS classed vessels, MODUs or facilities which are in existence or under contract for construction on the date of the ABS Rules used to evaluate the Product.

ABS makes no representations regarding Type Approval of the Product for use on vessels, MODUs or facilities built after the date of the ABS Rules used for this evaluation.

Due to wide variety of specifications used in the products ABS has evaluated for Type Approval, it is part of our contract that; whether the standard is an ABS Rule or a non-ABS Rule, the Client has full responsibility for continued compliance with the standard.




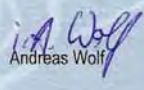
**CHOCK DESIGN B.V.**  
Model Name(s): RotaChock (RC)

<b>Presented to:</b>	CHOCK DESIGN B.V. TINSTRAAT 3 RIDDERKERK Netherlands
<b>Intended Service:</b>	Marine and Offshore Applications
<b>Description:</b>	Chock mounts for machinery (engines, gear boxes, generators, motors, pumps, etc), adjustable steel chocks
<b>Ratings:</b>	Please see the attached "pdf" pages for maximum loads
<b>Service Restrictions:</b>	Unit Certification is not required for this product. If the manufacturer or purchaser request an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.
<b>Comments:</b>	a) Details and design calculations for chocking arrangement should be submitted for review for each installation by OEM or Shipyard b) The chock should be installed in accordance with manufacturer's instructions to the satisfaction of the attending Surveyor.
<b>Notes / Documentation:</b>	Supporting Documentation: Westmoreland Mechanical Testing & Research Report No.9-35670, dated 8 September 2009; Manufacturer Facility: MDG Techniek in Zuid-Holland, Netherlands (WCN 404007, Tel: 31-10 44 12 269);
<b>Term of Validity:</b>	This Product Design Assessment (PDA) Certificate 10-HS643780-PDA, dated 01/Dec/2010 remains valid until 30/Nov/2015 or until the Rules or specifications used in the assessment are revised (whichever occurs first). This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product. Use of the Product on an ABS classed





## 13.4 Germanischer Lloyd

		<b>GL</b> 
<i><b>Type Approval Certificate</b></i>		
This is to certify that the undernoted product(s) has/have been tested in accordance with the relevant requirements of the GL Type Approval System.		
Certificate No.	<b>20 494 - 11 HH</b>	
Company	Chock Design B.V. P.O. Box 121 2980 AC Ridderkerk, NETHERLANDS	
Product Description	Type Approval Rota Chock RC elements	
Type	RC2, RC3, RC4, RC4.5, RC5, RC6, RC7, RC8 RC9, RC10,	
Environmental Category	None	
Technical Data / Range of Application	<b>Technical Data:</b> Acc. to RotaChock Type Approval Document Ed 1.1.1, Chapter 3, RotaChock Dimension Chart and production drawings RC2-RC10  <b>Material of top, center and bottom plates:</b> • CS-ACE => Carbon Steel (St52-3 / SAE 1045) –Anti Corrosion Enhanced • SS=> Stainless Steel 316L • AS-ACE => Alloy Steel (42CrMo4 / SAE 4140)  <b>Range of Application:</b> Chocking of propulsion plants and auxiliary machinery	
Test Standard	GL Rules Chapter VI, Part 7, 2007 " Guidelines for the Performance of Type Approvals "	
Documents	RotaChock Type Approval Document Ed 1.1.1 GL Audit report No. AR-1360-11-24079 143 Chock Design, 2011-10-24 GL Approval ref. no. 11-013410, 2011-12-08	
Remarks	General conditions acc. to GL " Guidelines for the Seating of Propulsion Plants and Auxiliary Machinery "	
Valid until	2016-12-12	
Page	1 of 3	Type Approval Symbol 
File No.	ILG.12	
Hamburg,	2011-12-13	
<b>Germanischer Lloyd</b>	 Olaf Crews	 Andreas Wolf
This certificate is issued on the basis of "Guidelines for the Performance of Type Approvals Part 1; Procedure".		


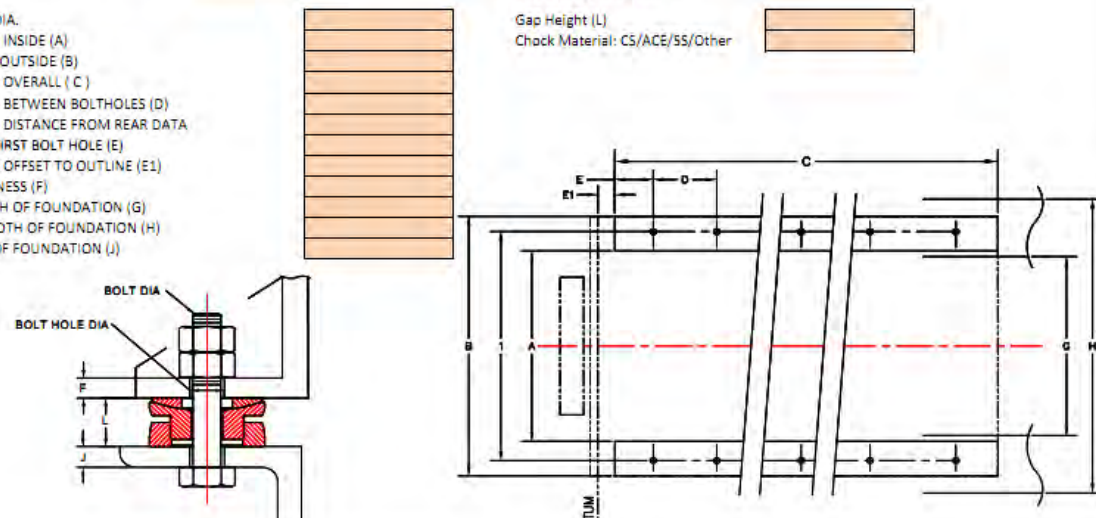


## 14 Data Sheets

To help you gathering the data we require to accurately calculate the correct RotaChock® size we have developed data sheets for various types of machinery. Fill in as many details as possible, and if available, include drawings, machinery installation instructions etc.

Go to the Downloads page on [www.rotachock.com](http://www.rotachock.com) to download a digital version of the data sheets.

### 14.1 Rail Mounted Engine

 <b>MACHINERY / FOUNDATION DATA SHEET</b>		Date:
<b>ENGINE 2 TEMPLATE</b>		
<b>CUSTOMER DATA</b>		
Company		Contact
Project:		Phone
Machine		Email
Make		
<b>REQUIRED DATA</b>		
Power (kW)		Weight (KG)
Speed (RPM)		Width between Holes (I)
Please supply OEM drawings with data sheet		
<b>BOLT DESIGN</b>	Bolt Size	Grade of Bolt / Material
	Qty of Bolts	
<b>GEOMETRY</b>	<b>CHOCK INFORMATION</b>	
BOLT HOLE DIA.	Gap Height (L)	
FOOT PRINT: INSIDE (A)	Chock Material: CS/ACE/SS/Other	
FOOT PRINT: OUTSIDE (B)		
FOOT PRINT: OVERALL (C)		
FOOT PRINT: BETWEEN BOLTHOLES (D)		
FOOT PRINT: DISTANCE FROM REAR DATA		
DATUM TO FIRST BOLT HOLE (E)		
DATUM LINE OFFSET TO OUTLINE (E1)		
FOOT THICKNESS (F)		
INSIDE WIDTH OF FOUNDATION (G)		
OUTSIDE WIDTH OF FOUNDATION (H)		
THICKNESS OF FOUNDATION (J)		
		



## 14.2 Foot Mounted Engine

<b>MACHINERY / FOUNDATION DATA SHEET</b>		Date: <input style="width: 100px;" type="text"/>
ENGINE TEMPLATE		
<b>CUSTOMER DATA</b>		
Company: <input style="width: 90%;" type="text"/> Project: <input style="width: 90%;" type="text"/> Machine: <input style="width: 90%;" type="text"/> Make: <input style="width: 90%;" type="text"/>	Contact: <input style="width: 90%;" type="text"/> Phone: <input style="width: 90%;" type="text"/> Email: <input style="width: 90%;" type="text"/>	
<b>REQUIRED DATA</b>		
Power (kW): <input style="width: 100px;" type="text"/> Speed (RPM): <input style="width: 100px;" type="text"/>	Weight (KG): <input style="width: 100px;" type="text"/> Width between Holes (1): <input style="width: 100px;" type="text"/> Width between Holes (2): <input style="width: 100px;" type="text"/>	
Please supply OEM drawings with data sheet		
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <b>BOLT DESIGN</b>            Bolt Size: <input style="width: 100px;" type="text"/>            Qty of Bolts: <input style="width: 100px;" type="text"/> </div> <div style="width: 45%;">           Grade of Bolt / Material: <input style="width: 150px;" type="text"/> </div> </div>		
<div style="display: flex;"> <div style="width: 40%;"> <b>GEOMETRY</b>            BOLT HOLE DIA.            FOOT PRINT: INSIDE (A)            FOOT PRINT: OUTSIDE (B)            FOOT PRINT: OVERALL (C)            FOOT PRINT: BETWEEN BOLTHOLES (D)            FOOT PRINT: DISTANCE FROM REAR DATA            DATUM TO FIRST BOLT HOLE (E)            DATUM LINE OFFSET TO OUTLINE (E1)            FOOT THICKNESS (F)            INSIDE WIDTH OF FOUNDATION (G)            OUTSIDE WIDTH OF FOUNDATION (H)            THICKNESS OF FOUNDATION (J)         </div> <div style="width: 60%;"> <div style="margin-bottom: 20px;"> </div> <div> </div> </div> </div>		
<b>CHOCK INFORMATION</b> Gap Height (L): <input style="width: 100px;" type="text"/> Chock Material: CS/SS/Other: <input style="width: 100px;" type="text"/>		





### 14.3 Electric Motor / Generator

<b>MACHINERY / FOUNDATION DATA SHEET</b> <span style="float: right;">Date: <input style="width: 100px;" type="text"/></span>	
ELECTRIC MOTOR / GENERATOR TEMPLATE	
<b>CUSTOMER DATA</b> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">           Company: <input style="width: 90%;" type="text"/>            Project: <input style="width: 90%;" type="text"/>            Machine: <input style="width: 90%;" type="text"/>            Make: <input style="width: 90%;" type="text"/> </div> <div style="width: 45%;">           Contact: <input style="width: 90%;" type="text"/>            Phone: <input style="width: 90%;" type="text"/>            Email: <input style="width: 90%;" type="text"/> </div> </div>	
<b>MINIMUM REQUIRED DATA</b> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">           Power (kW): <input style="width: 80%;" type="text"/>    kVA: <input style="width: 80%;" type="text"/>            Speed (RPM): <input style="width: 80%;" type="text"/> </div> <div style="width: 45%;">           Weight (KG): <input style="width: 80%;" type="text"/>            Width between Holes (1): <input style="width: 80%;" type="text"/> </div> </div>	
Please supply OEM drawings with data sheet	
<b>BOLT DESIGN</b> Bolt Size: <input style="width: 80%;" type="text"/> Qty of Bolts: <input style="width: 80%;" type="text"/> Grade of Bolt / Material: <input style="width: 80%;" type="text"/>	<b>CHOCK INFORMATION</b> Gap Height (L): <input style="width: 80%;" type="text"/> Chock Material: CS/SS/Other: <input style="width: 80%;" type="text"/>
<b>GEOMETRY</b> BOLT HOLE DIA. FOOT PRINT: INSIDE (A) FOOT PRINT: OUTSIDE (B) FOOT PRINT: OVERALL (C) FOOT PRINT: BETWEEN BOLTHOLES (D) FOOT PRINT: DISTANCE FROM REAR DATA DATUM TO FIRST BOLT HOLE (E) DATUM OFFSET TO OUTLINE (E1) FOOT THICKNESS (F) INSIDE WIDTH OF FOUNDATION (G) OUTSIDE WIDTH OF FOUNDATION (H) THICKNESS OF FOUNDATION (J)	



## 14.4 Compressor

Machinery Mounting Solutions™		MACHINERY / FOUNDATION DATA SHEET		Date: <input type="text"/>	
COMPRESSOR TEMPLATE					
<b>CUSTOMER DATA</b>					
Company	<input type="text"/>			Contact	<input type="text"/>
Project	<input type="text"/>			Phone	<input type="text"/>
Machine	<input type="text" value="Compressor"/>			Email	<input type="text"/>
Make	<input type="text"/>				
<b>REQUIRED DATA</b>					
Power (kW)	<input type="text"/>	Weight (Kg)	<input type="text"/>		
Speed (RPM)	<input type="text"/>	Width between Holes (L)	<input type="text"/>		
Please supply OEM drawings with data sheet		No of Cylinders	<input type="text"/>		
<b>BOLT DESIGN</b>	Bolt Size	<input type="text"/>	Weight of Cylinder (Kg)	<input type="text"/>	
	Grade of Bolt / Material	<input type="text"/>	Tapped Holes Size (T)	<input type="text"/>	
	Qty of Bolts	<input type="text"/>	Grade of Bolt / Material	<input type="text"/>	
			Using Optional Supports	<input type="text" value="Yes / No"/>	
<b>GEOMETRY</b>					
BOLT HOLE DIA.	<input type="text"/>				
FOOT PRINT: INSIDE (A)	<input type="text"/>				
FOOT PRINT: OUTSIDE (B)	<input type="text"/>				
FOOT PRINT: OVERALL (C)	<input type="text"/>				
FOOT PRINT: BETWEEN BOLTHOLES (D)	<input type="text"/>				
FOOT PRINT: DISTANCE (E)	<input type="text"/>				
FOOT PRINT: DISTANCE (E1)	<input type="text"/>				
FOOT PRINT: DISTANCE (K)	<input type="text"/>				
FOOT THICKNESS (F)	<input type="text"/>				
INSIDE WIDTH OF FOUNDATION (G)	<input type="text"/>				
OUTSIDE WIDTH OF FOUNDATION (H)	<input type="text"/>				
THICKNESS OF FOUNDATION (J)	<input type="text"/>				
		<b>CHOCK INFORMATION</b> Gap Height (L) <input type="text"/> Chock Material: CS/SS/Other <input type="text"/>			