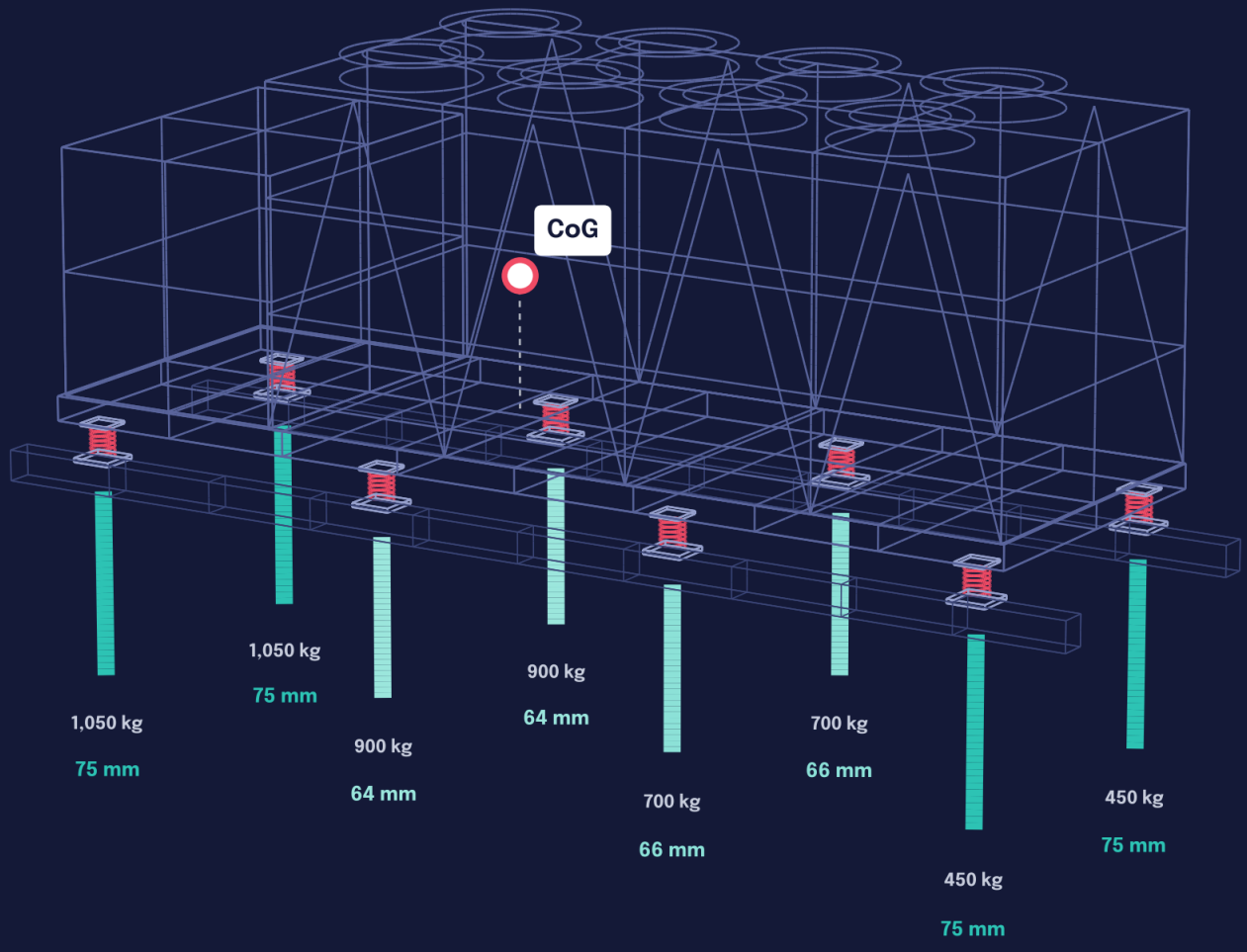
ACREFINE ENGINEERING

SAMPLE REPORT

NOISE AND VIBRATION CONTROL

Vibration Isolation of a Rooftop Chiller

Spring isolators for a long-span roof, checked at every speed the chiller runs — results summary



Centre of gravity, and the point load and static deflection at each spring isolator · 63.5 mm minimum for the 12 m roof span

DOCUMENT	REVISION	DATE	STATUS
ACR-SAMPLE-VI-01	S1	30 October 2026	Summary edition

VERIFY THIS DOCUMENT

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Sample report — summary edition. The equipment, project and site are fictitious and all values are illustrative. This edition shows what an Acrefine vibration isolation assessment delivers; the calculations behind it are not reproduced. Not a design document and not to be relied on for any real installation.

AT A GLANCE

A 6.2-tonne chiller on a data centre roof was selected onto spring isolators to suit the roof's 12 m span, and checked at every operating speed. It is well isolated across its whole fan range, provided the fans never run below 300 rpm.

63.5 mm	82%	1.97 Hz	23×
Minimum spring deflection Set by the 12 m roof span	**Isolation at lowest fan speed** 99.8% at the compressors	**Stiffest isolator** Well below the slowest fans	**Spring vs roof deflection** Roof stiffness criterion met

DOCUMENT CONTROL

Rev	Date	Description	Prepared	Checked	Approved
S1	30/10/2026	Sample issue — summary edition	[Engineer]	[Checker]	[Engineering Director]

CONTENTS

01 The equipment and the question 3
02 How we assess it 4
03 What the analysis shows 5
04 Verdict and recommendations 6

SAMPLE

01 The equipment and the question

Which isolators keep the chiller's vibration out of the building, at every speed it runs?

An air-cooled screw chiller sits on steel dunnage on the roof of a data centre, over beams of 12 m span and above a data hall. Eight variable-speed fans and two screw compressors drive it. The compressor end carries more than twice the load of the far end, so every mounting point is treated on its own.

6,200 kg	8	12 m	300–700
Operating mass	Mounting points	Roof beam span	Fan speed range, rpm

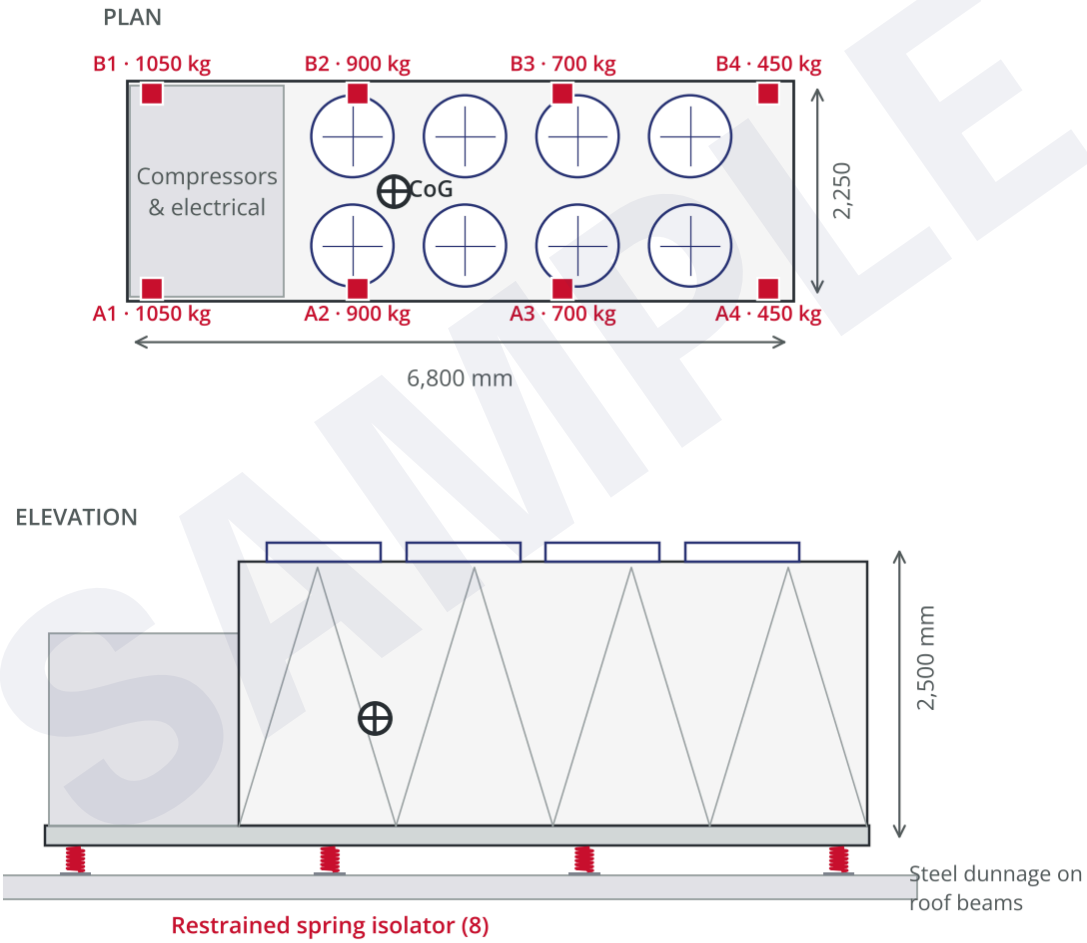


Figure 1 The chiller in plan and elevation, with the load at each of its eight mounting points. Fictitious equipment.

SAMPLE

02 How we assess it

Every Acrefine vibration isolation assessment follows the same six steps, from the equipment's loads to the floor that carries it, and ends in a clear verdict.

01
Equipment and loads
Mass, centre of gravity and the load at every mounting point

→

02
Span requirement
How soft the springs must be for the floor span below

→

03
Isolator selection
Springs matched to each point load and to that deflection

04
Isolation check
Isolator frequency against every operating speed of the equipment

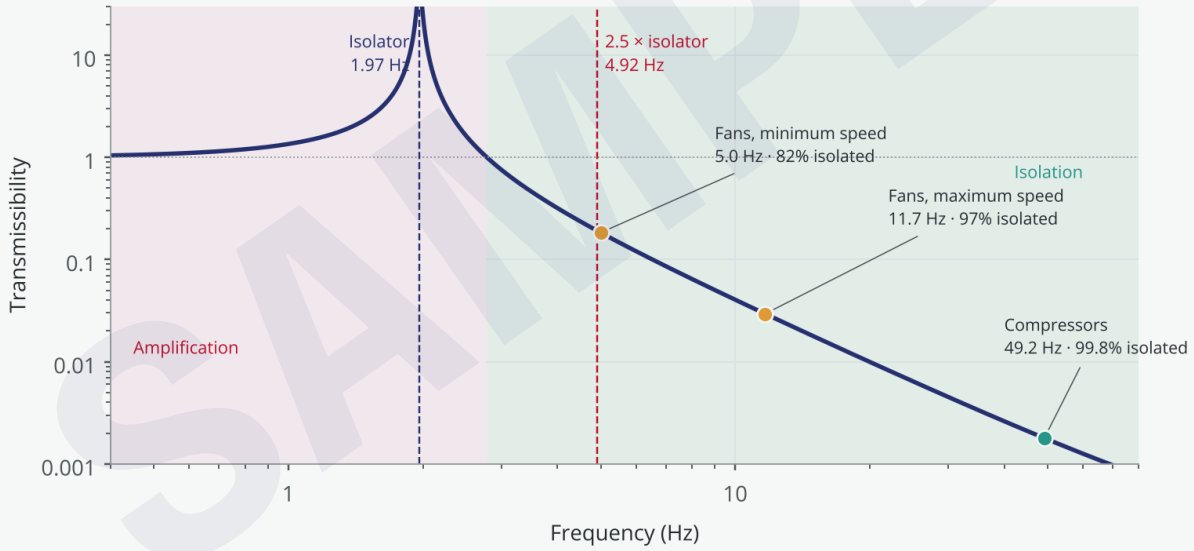
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05
Support check
Spring deflection against the floor's own deflection

→

06
Verdict and fixes
Results summarised, with practical installation recommendations

The selected isolators against the chiller's own speeds



How much vibration the isolators let through at each frequency. The chiller's fans and compressors all sit in the isolation region.

The span of the roof beams sets how soft the springs must be. Springs selected to that requirement and to each point load isolate the slowest fans by 82% and the compressors almost completely.

The isolation percentages are the share of the chiller's vibrating force that the isolators keep out of the roof, from a single-mass spring model. They are not a prediction of the vibration or noise that would be measured in the building.

SAMPLE

03 What the analysis shows

Every spring meets the deflection the roof span asks for, and the whole fan range sits in the isolation region.

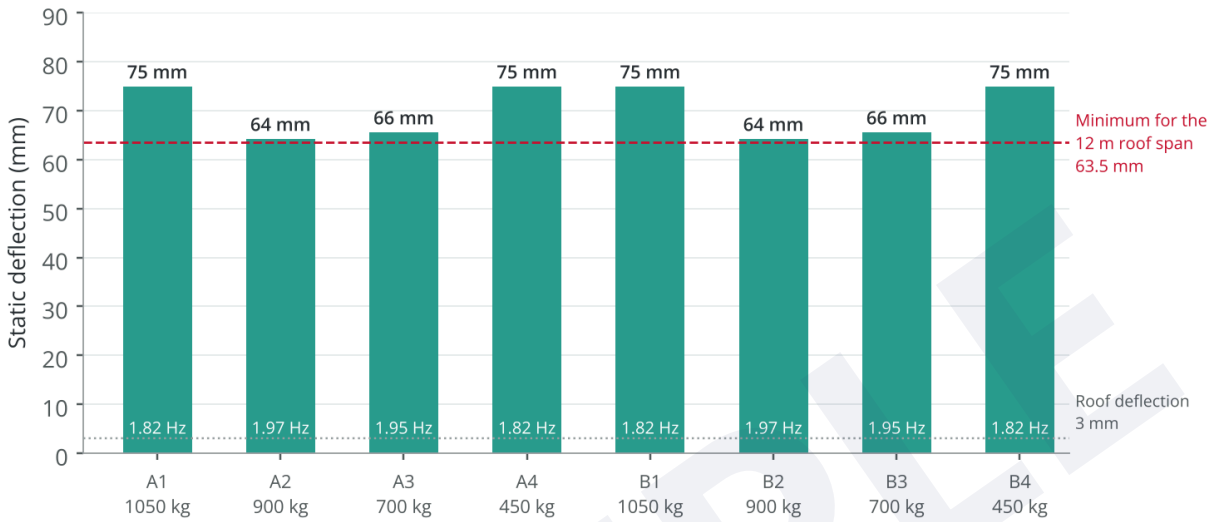


Figure 2 Static deflection of each isolator under its own load, against the minimum for the 12 m roof span.

Chosen position by position, the springs deflect 64 to 75 mm although the heaviest point carries more than twice the lightest. The roof itself deflects only 3 mm under the chiller; the springs deflect 23 times more, well beyond the ten times the selection criterion asks for, so the roof meets the stiffness criterion with a wide margin.

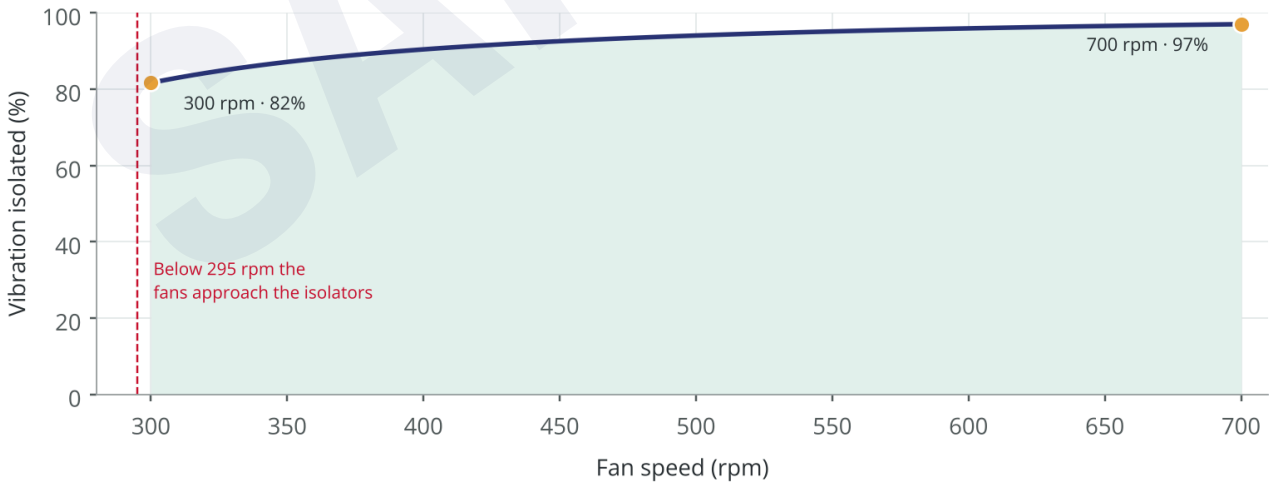


Figure 3 Isolation across the whole variable-speed fan range.

The slowest fan speed is the frequency closest to the isolators, so it decides the verdict. At 300 rpm the isolators remove 82% of the vibration, rising to 97% at full speed.

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04 Verdict and recommendations

The chiller is well isolated from the roof at every operating speed, provided the measures below are put in place.

Check	Result	Status
Spring deflection for the roof span	Met at every mounting point	PASS
Isolation across the fan speed range	82% or better	PASS
Isolation at the compressors	99.8%	PASS
Roof stiffness under the isolators	Springs 23× softer than the roof	PASS
Levelling and limit stops	To be set and recorded at commissioning	OPEN

01 Mount the chiller on eight restrained spring isolators, each selected to its own point load and to the deflection the roof span requires.

02 Level the isolators to equal operating height with the chiller filled, and set the limit stops clear so they do not touch in normal operation.

03 Set 300 rpm as the minimum fan speed in the controller.

04 Check at commissioning that no rigid pipe, conduit or duct connection bridges the isolators.

SAMPLE

The full report goes further

A project assessment carries every step in full, signed by the preparing, checking and approving engineers:

- Isolator schedule with loads, ratings and deflections
- Isolation check at every operating speed
- Floor stiffness check under the isolators
- Commissioning notes, with the calculation appendix

Seismic restraint of isolated equipment is a separate Acrefine assessment, with wind loading checked on request.

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Ask for the full sample, or tell us about your project. Every message is read by an engineer.