LANKHORST
ENGINEERED PRODUCTS

INSTALLATION MANUAL

KLP® CoilWedge System 40

CoilWedge System 40 for Safe and Flexible Storage of Coils

EN – original instructions

KLP®

Original instructions

This manual has been translated into multiple languages. The original manual is written in US English. All other language versions are translations of the original manual.

Copyright

Disclaimer of liability

The manufacturer cannot be held responsible for personal injury, damage to the CoilWedge System 40, or property damage caused by incorrect use, foreseeable misuse, or failure to follow the instructions in this manual. This also applies to unauthorized modifications of the CoilWedge System 40 and the use of non-approved parts or tools.

Contact details

For questions about the product or this manual, please contact:

Lankhorst Engineered Products
Prinsengracht 2
8607 AD Sneek
The Netherlands
Tel. +31 (0)515 487690
E-mail: info@coilstorage.com
Website: www.coilstorage.com

INTRODUCTION

About this document

This document is an installation manual providing a set of guidelines to be followed during the installation and use of the CoilWedge System 40.

This manual is intended for all personnel involved in installation, use and maintenance of the CoilWedge System 40.

Only trained personnel who have thoroughly read and understood this manual should be involved in installing the CoilWedge System 40.

This manual is designed to address most questions that may arise during the installation process. However, there may be areas that require further clarification. In such cases, we kindly ask the purchaser to contact the supplier for assistance. Please refer to the **Contact details**.

Technical drawings

The technical drawings of the CoilWedge System 40 are available upon request in pdf-format. Please refer to the **Contact details**.

Regulatory information

The CoilWedge System 40 has been designed and manufactured to meet all relevant safety and quality standards for industrial use. Additionally, the system is TÜV certified for the safe storage of steel coils up to a maximum of two levels high. However, it does not require CE marking because it falls outside the scope of the European Union's CE marking directives.
The CoilWedge System 40 is a passive component used as part of a coil storage solution. It is not classified as machinery or powered equipment, so it is not allowed to carry the CE marking.
Should further clarification be needed please contact us for additional documentation or guidance.

Symbols used

	Description
⚠ DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTICE	Is used to address practices not related to physical injury.

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1 THE COILWEDGE SYSTEM 40

1.1 Intended use

The CoilWedge System 40 is intended for use in indoor storage areas. However, for outdoor applications, a Weather Resistant (WR) version is available, specifically designed to withstand exposure to external conditions.

Additionally, the standard CoilWedge System 40 is suitable for storing coils with temperatures up to 60°C (140°F).

The CoilWedge System 40 is intended for use in environments where coils are stored and handled using appropriate lifting equipment, such as cranes or forklifts.

The CoilWedge System 40 should not be used for outdoor storage unless the WR version is specified, and it should only be used for cylindrical objects. Additionally, it must not exceed a maximum load of 40 metric tons (~88,185 lbs) on two CoilWedges CWS40.

The system should be used within the coil dimension and weight limits as outlined in this manual or as calculated using the Coilstacker software.

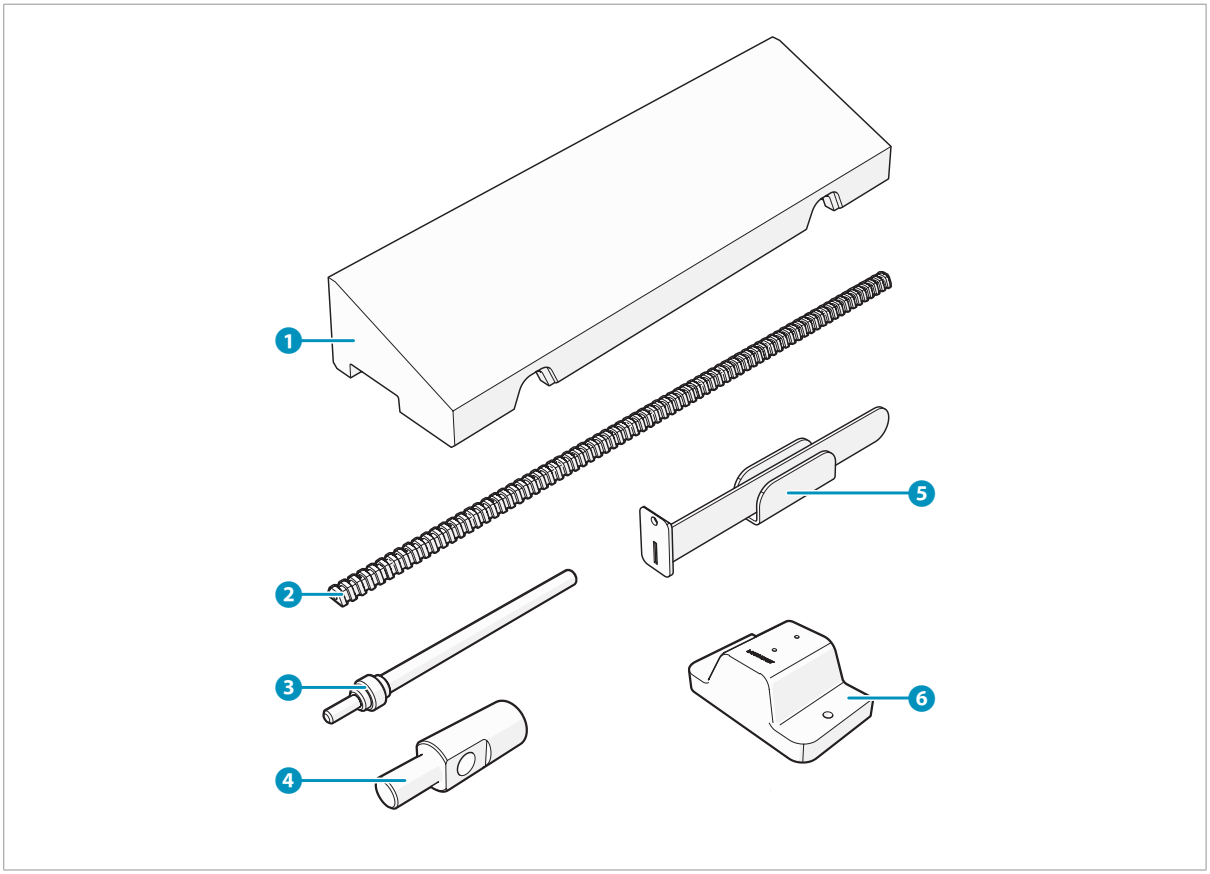
1.2 Reasonably foreseeable unintended use

The CoilWedge System 40 is not intended for:

- non-cylindrical objects.
- standing or walking on the system.
- applying dynamic loads exceeding 0.15 m/s (0.49 ft/s) speed.

2 COILWEDGE SYSTEM 40 DESCRIPTION

2.1 Main parts



Product name	Article number	Width		Depth	
		mm	ft/in	mm	ft/in
1. CoilWedge CWS40 120/34	253443	1200	3' 11 ¼"	340 mm	1' 1 ⅜"
CoilWedge CWS40 150/34	253445	1500	4' 11 1/16"		
CoilWedge CWS40 120/43	253444	1200	3' 11 ¼"	430 mm	1' 4 15/16"
CoilWedge CWS40 150/43	253446	1500	4' 11 1/16"		

Product name	Article number	Description
2. Rail RSS40	252552	Indoor
	252558	Weather Resistant
3. Installation Tool RSS40	252556	–
4. Steel Connector RSS40	252553	Indoor
	252559	Weather Resistant
5. CoilWedge Bracket CWS40	512268	CoilWedge with width 430
	512733	CoilWedge with width 340
6. Endcap RSS40	253132	–

2.2 Main parts description

The CoilWedge System 40 design consists mainly of the CoilWedges CWS40 and the rail components.

CoilWedge CWS40
The CoilWedges CWS40 are made from a polyolefin compound for durability and resistance to impact and abrasion.

Coils are placed onto the CoilWedges, which cradle the coil securely and prevent rolling.
The CoilWedges can be added or removed to accommodate different coil dimensions and configurations.

⚠ CAUTION	**Risk of improper functionality of the system** • Coils above 60°C (140°F) can compromise the integrity of the CoilWedges. Ensure the coil temperature is below 60°C (140°F) to maintain product performance and prevent damage to the CoilWedges.

Endcap
The Endcaps are installed to maintain the correct distance between the two parallel rails and/or ensure that CoilWedges cannot be placed over the ends of the rails. The Endcaps must always be installed.

⚠ CAUTION	**Crushing hazard** • Failure to use Endcaps may result in a CoilWedge being placed half on the rail, creating a potential safety hazard. Ensure that Endcaps are properly installed to prevent this condition.

Rail RSS40
The steel reinforced rails provide a solid foundation for the CoilWedges. The rail segments are 4.04 m (13’ 3”) long. The segments can be connected to create a rail of any desired length. If needed, the first or last rail of the row can be cut to length using an iron saw or angle grinder. The rail segments can be mounted to the floor for additional stability.

The Rail RSS40 comes in two variants: the standard version and the Weather Resistant version.

⚠ CAUTION	**Risk of improper functionality of the system:** Never use the standard system outdoors. For outdoor use, request Weather Resistant components.

Steel Connector
The Steel Connector is used to link rail sections in the length direction securely, providing a continuous and stable track for the CoilWedges. Connectors are designed with left and right screw threads for easy tightening.

The Steel Connector comes in two variants: the standard version and the Weather Resistant version.

⚠ CAUTION	**Risk of improper functionality of the system:** Never use the standard system outdoors. For outdoor use, request Weather Resistant components.

Installation Tool
The Installation Tool is a specialized tool provided with the system to help secure the Steel Connectors. The tool's ring ensures that connectors are tightened properly and within the right tolerances, and it is crucial for ensuring correct alignment between rail segments.

CoilWedge Bracket CWS40
The CoilWedge Bracket CWS40 is used to connect multiple CoilWedges together if needed.

3 SAFETY

3.1 Personal protective equipment

Personnel that interact with the system must equip themselves with the following PPE:

Symbol	Description	When
	Wear protective glasses or goggles.	During installation.
	Wear protective gloves.	During installation.
	Wear protective shoes.	During installation.

3.2 Residual risks

While the CoilWedge System has been designed and engineered to minimise risks, some residual risks cannot be fully eliminated. Please carefully read and understand the following:

- **Slippage or Tripping Hazards:** The system may become slippery if wet or contaminated. Ensure that the surface is clean and dry during use.
- **Impact or Crush Hazards:** Improper installation or overloading can lead to material fatigue or failure. Adhere to all load limits and inspection schedules.
- **Material Degradation:** Over time, components may degrade due to weather or chemicals. Regularly inspect for any signs of damage or wear.
- **Sharp Edges:** Handle steel components with care and wear gloves to avoid injury from sharp edges or burrs.

These risks must be considered by the user, and all safety instructions must be followed. Contact the supplier for further assistance. Please refer to the **Contact details**.

3.3 Safety features

The Endcaps are a vital protection that ensure that CoilWedges cannot be placed over the ends of the rails.

3.4 Safety warnings and regulations

To maintain system integrity, carefully read all instructions and familiarize yourself with local safety procedures at the installation site. This document provides basic safety guidelines but may not cover all potential hazards.

⚠ DANGER	**Risk of serious injury from improper installation** • Only trained personnel who have thoroughly read and understood this manual should install the CoilWedge System 40. **Risk of collapse and injury** • Exceeding the maximum load could result in equipment collapse and serious injury. Never exceed the maximum load of 40 metric tons (~88,185 lbs.) on two CoilWedges. • Improper stacking could result in death or serious injury. Always place the largest, heaviest, and widest coils at the bottom layer, and never stack more than two layers high. • Incorrect rail connections may cause serious injury. Use only steel connectors provided by Lankhorst; self-made connectors compromise system safety. Never use self-made connectors. • Incorrect CoilWedge connections may cause serious injury. Use only CoilWedge brackets provided by Lankhorst; self-made brackets compromise system safety. Never use self-made brackets.
⚠ WARNING	**Crushing hazard** • Use of the system for unintended applications could result in death or serious injury. Always verify that the application is within the system's specifications. Never use the system for applications for which it is not intended. • Failure to use Endcaps may result in a CoilWedge being placed half on the rail, creating a potential safety hazard. Ensure that Endcaps are properly installed to prevent this condition. • When the CoilWedges are not connected side by side with the CoilWedge Brackets, each coil must rest fully on a single CoilWedge. Do not place coils across gaps between unconnected CoilWedges or overhang the ends of a row. This may cause tipping or collapse, resulting in serious injury. • Connected CoilWedges may be treated as a continuous support surface, allowing centered coils to span the joint. However, no coil may overhang the end of a row, even when CoilWedges are connected. Overhanging ends can compromise stability and cause injury. • A single coil on an unconnected CoilWedge may overhang up to 400 mm (15 ¾") per side if centered and evenly balanced. Uneven or excessive overhang may lead to tipping and serious injury.

⚠ WARNING	• Two-level stacking is only allowed when bottom-layer coils have equal diameter and top-layer coils are equal to or smaller in both diameter and width. Always verify mixed stacks with the Coilstacker software. Incorrect stacking may cause instability and serious injury. • Only stack coils that meet the OD < 4W rule: the outer diameter must be less than four times the coil width.
⚠ CAUTION	**Cutting hazard** • Failure to handle with care may result in cuts or abrasions. Always wear cut-resistant gloves when handling the steel components to avoid injury. **Risk of improper functionality of the system** • Improper floor conditions may result in system damage or moderate injury. Ensure floor surfaces are level and strong enough, with a maximum slope of 0.5°. If there are any holes in the floor, fill the holes to prevent potential damage or instability. • The first and or last rail segment in a row may be shortened. Shorter rail sections may compromise system stability and safety. Only use rail sections of at least 1 m (3' 3 ") in length to ensure secure and proper system operation. • Incorrect coil positioning may lead to system damage or moderate injury. Ensure coils do not rest directly on the rail system and that the distance between CoilWedges is correctly set. • High crane speeds may damage the system. Ensure crane speed does not exceed 0.15 m/s (0.49 ft/s) when positioning coils to avoid excessive impact on the system. • Coils above 60°C (140°F) can compromise the integrity of the CoilWedges. Ensure the coil temperature is below 60°C (140°F) to maintain product performance and prevent damage to the CoilWedges. • Failure to maintain or inspect may result in system damage. Regularly inspect system components for damage or deformation, refer to **5.1 Periodic maintenance**. • Never use the standard system outdoors. For outdoor use, request Weather Resistant components.

4 INSTALLATION

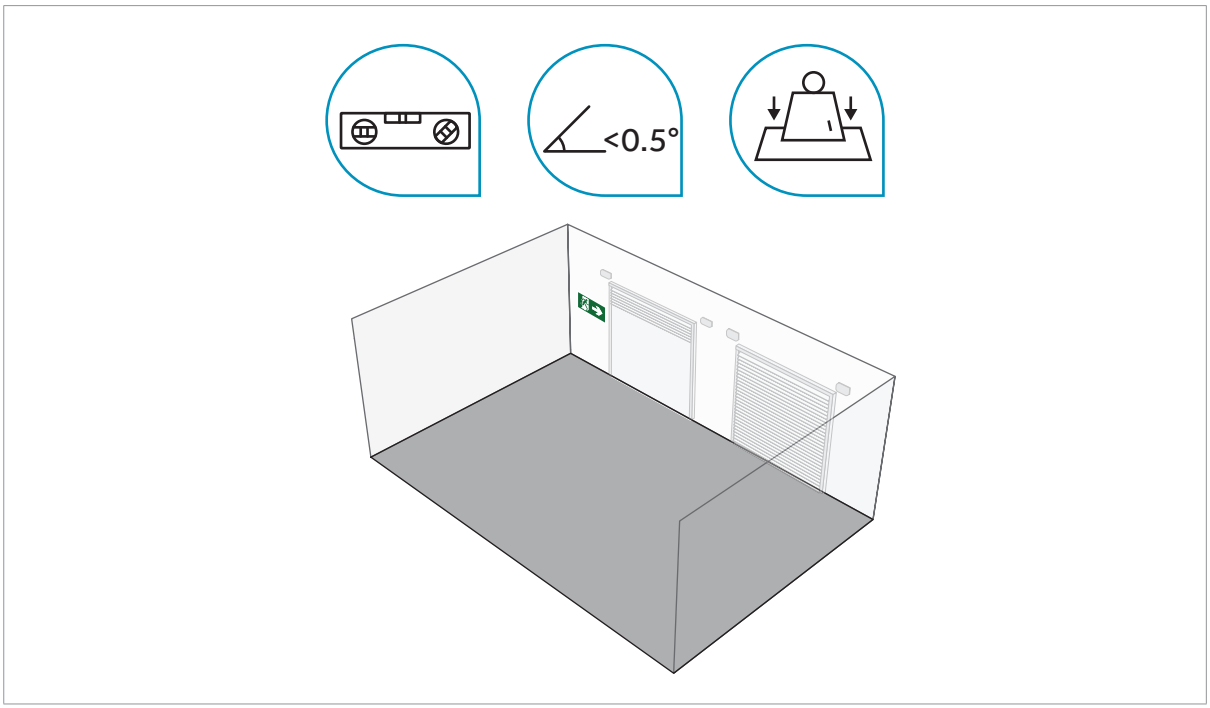
4.1 Contents of the package

Check the contents of the packaging to ensure that all ordered components have been included. If any parts are missing or damaged, contact the supplier before proceeding.

4.2 Requirements for the location of installation

Before setting up the CoilWedge System 40, it is mandatory to take the following rules into account:

- Make sure floor surfaces are levelled, and the floor construction is strong enough to bear the load of the coils.
- Make sure the floor is horizontal with a maximum descending surface of 0.5°.
- Make sure storage areas, transport and emergency routes are marked.



4.3 Determining the setup

⚠ DANGER	**Risk of collapse and injury** • Exceeding the maximum load could result in equipment collapse and serious injury. Never exceed the maximum load of 40 metric tons (~88,185 lbs.) on two CoilWedges. • Improper stacking could result in death or serious injury. Always place the largest, heaviest, and widest coils at the bottom layer, and never stack more than two layers high.
⚠ WARNING	**Crushing hazard** • A single coil on an unconnected CoilWedge may overhang up to 400 mm (15 ¾") per side if centered and evenly balanced. Uneven or excessive overhang may lead to tipping and serious injury.
⚠ CAUTION	**Risk of improper functionality of the system** • Incorrect coil positioning may lead to system damage or moderate injury. Ensure coils do not rest directly on the rail system and that the distance between CoilWedges is correctly set.

1. Measure the dimensions of the coils.
2. Determine using option A or B the setup of the CoilWedge System 40 based on the coil amount, dimensions and weight.

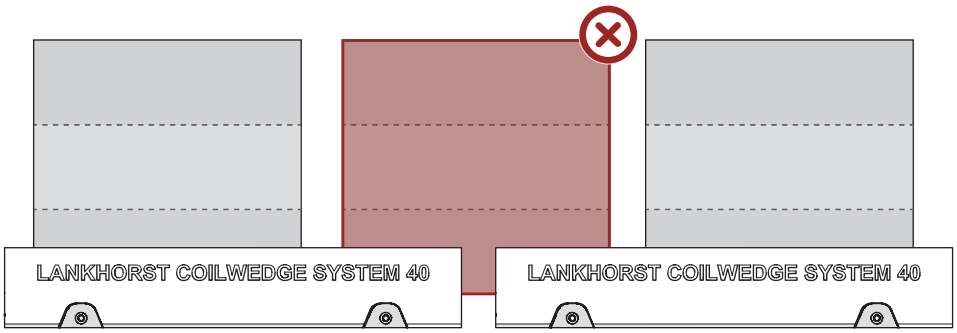
Option A – Using the tables
Use the tables if the coils are of equal diameters and weights. The tables provide safe stacking arrangements. Refer to Appendix II for all allowable arrangements.

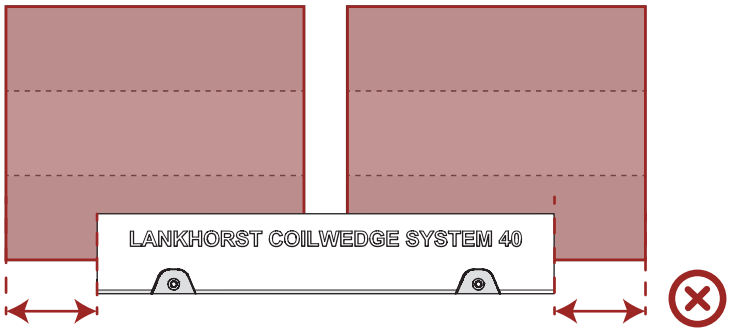
Option B – Using the Coilstacker software
Use the Coilstacker software for coils of any diameter or weight. The software simulates the CoilWedge System 40 and evaluates stacking safety based on your defined coil specifications. The software indicates the number of coils that can be stored per row. The software also provides additional information on your particular stacking arrangement (like reaction forces).
Go to www.coilstacker.com.

General guidlines for safe stacking:

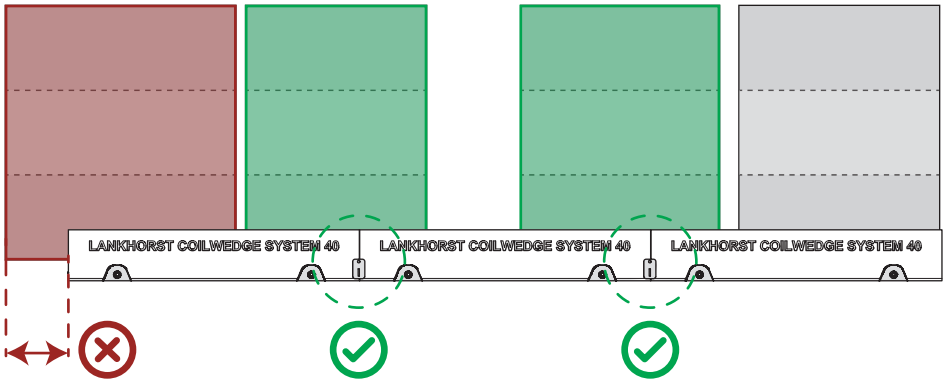
- Place the coil with the largest diameter on the bottom layer when the coils have different diameters.
- Place the heaviest coil on the bottom layer when the coils have different weights.
- Place the widest coil on the bottom layer when the coils have different widths.
- Only stack coils that meet the OD < 4W rule: the outer diameter must be less than four times the coil width.
- Use the Coilstacker software or consult your Lankhorst contact person when stacking coils >13 metric tons (28,660 lbs). Please refer to the **Contact details**.

⚠ WARNING	• When the CoilWedges are not connected side by side with the CoilWedge Brackets, each coil must rest fully on a single CoilWedge. Do not place coils across gaps between unconnected CoilWedges or overhang the ends of a row. This may cause tipping or collapse, resulting in serious injury.

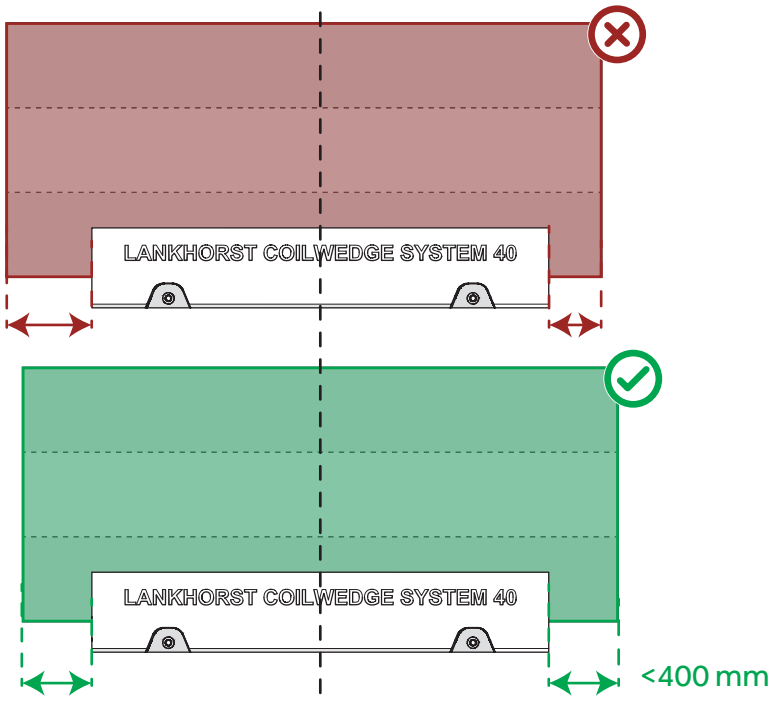




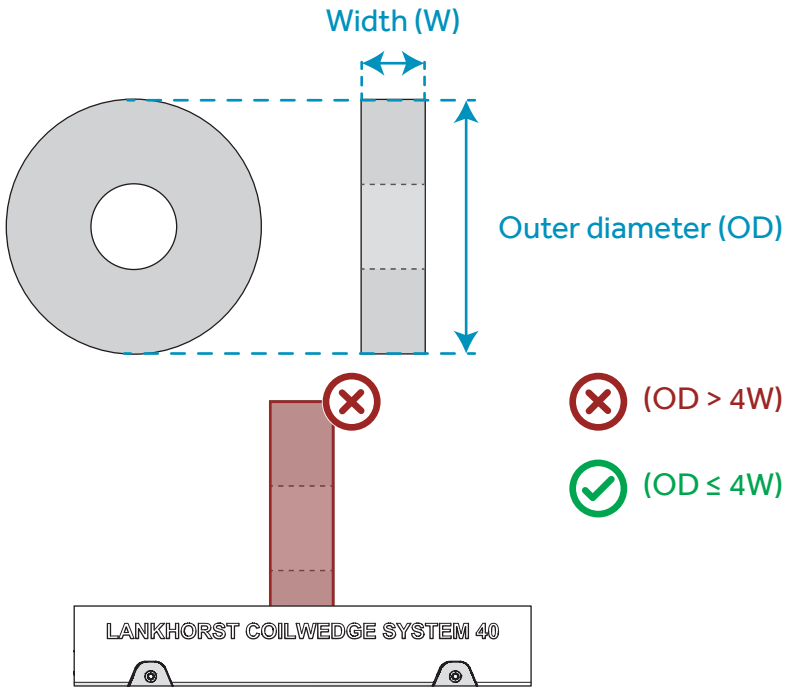
⚠ WARNING	• Connected CoilWedges may be treated as a continuous support surface, allowing centered coils to span the joint. However, no coil may overhang the end of a row, even when CoilWedges are connected. Overhanging ends can compromise stability and cause injury.



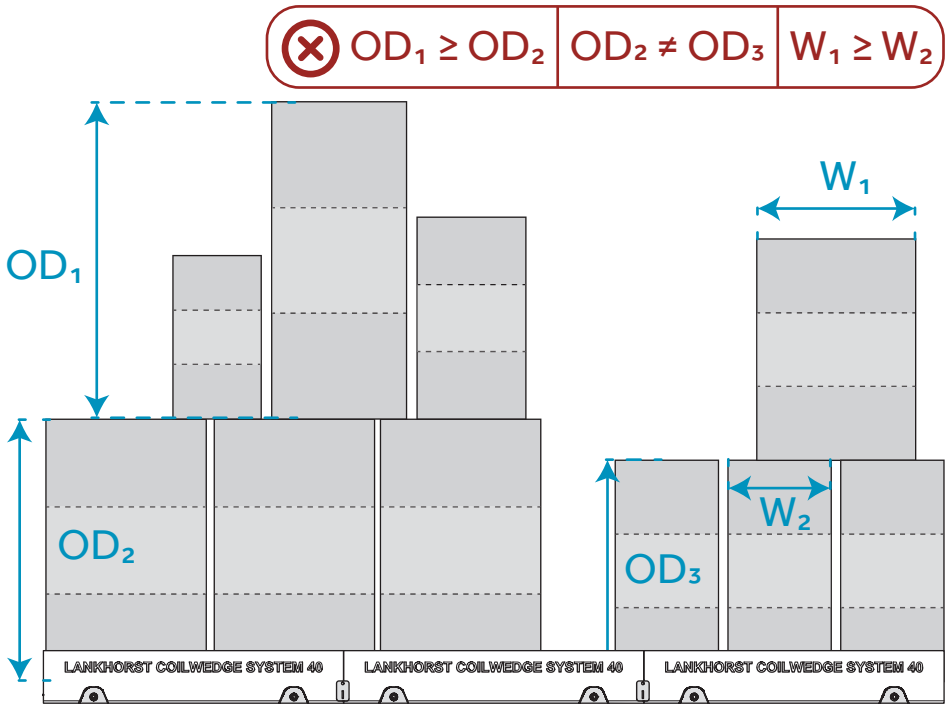
⚠ WARNING	• A single coil on an unconnected CoilWedge may overhang up to 400 mm (15 ¾") per side if centered and evenly balanced. Uneven or excessive overhang may lead to tipping and serious injury.

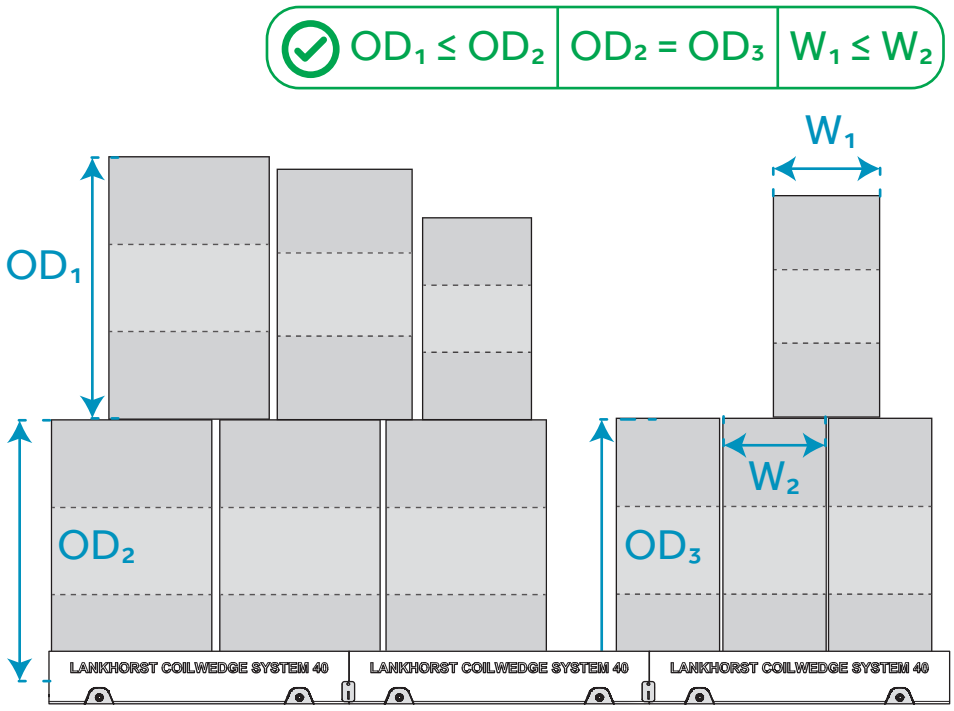


⚠ WARNING	• Only stack coils that meet the OD < 4W rule: the outer diameter must be less than four times the coil width.



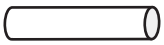
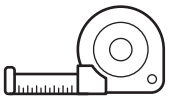
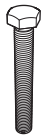
⚠ WARNING	• Two-level stacking is only allowed when bottom-layer coils have equal diameter and top-layer coils are equal to or smaller in both diameter and width. Always verify mixed stacks with the Coilstacker software. Incorrect stacking may cause instability and serious injury.



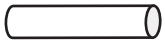
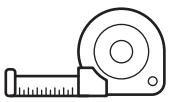
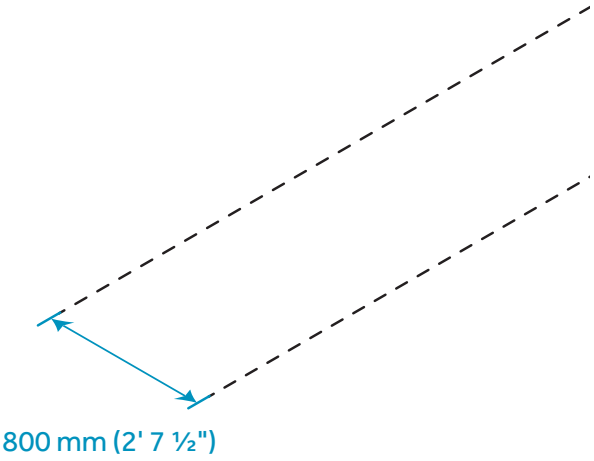


It is recommended to use the Coilstacker software to check all possible arrangements applicable for your coils and storage location to understand the limits of the system.

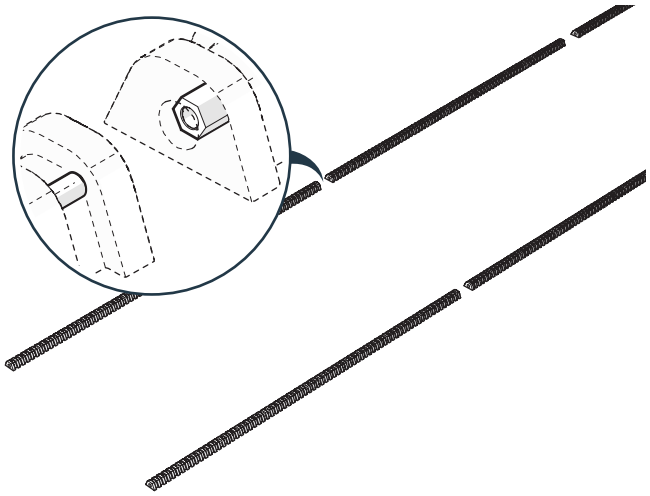
4.4 Mounting the CoilWedge System 40

Make sure all the required tools are at hand.				
				
Marker or chalk	Tape measure	Power drill	Self-tapping screw	Bolt

1. Mark the rail positions on the floor using chalk or a marker. Use a measuring tape to accurately place the marks.

NOTICE	The distance between the rails is 800 mm (2' 7 ½"). • A single coil on an unconnected CoilWedge may overhang up to 400 mm (15 ¾") per side if centered and evenly balanced. Uneven or excessive overhang may lead to tipping and serious injury.
 	

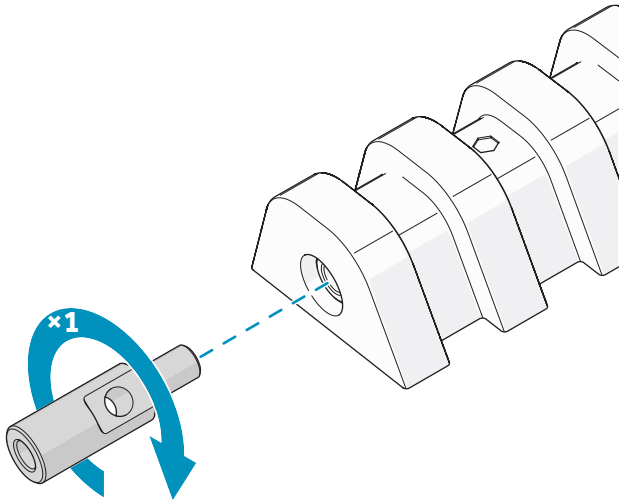
2. Place the rails on the floor. Ensure the male connection of the rail faces the female connection of the following rail.



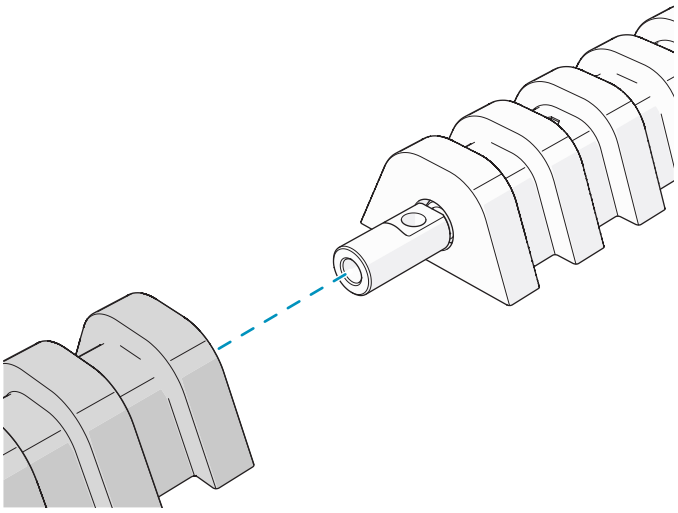
NOTICE	• Cut the rails with an iron saw or an angled grinder when necessary. • Rail sections should always be at least 1 m (3’ 3 “) in length. Cut rail sections may only be used at the beginning or end of a row and should adhere to the 1 m (3’ 3 “) minimum length requirement. The unused end of a cut rail can be utilized to start the next row. This approach maintains system stability.

3. Insert the male side of the Steel Connector to the female side of the rail. Tighten the Steel Connector clockwise only one full turn.

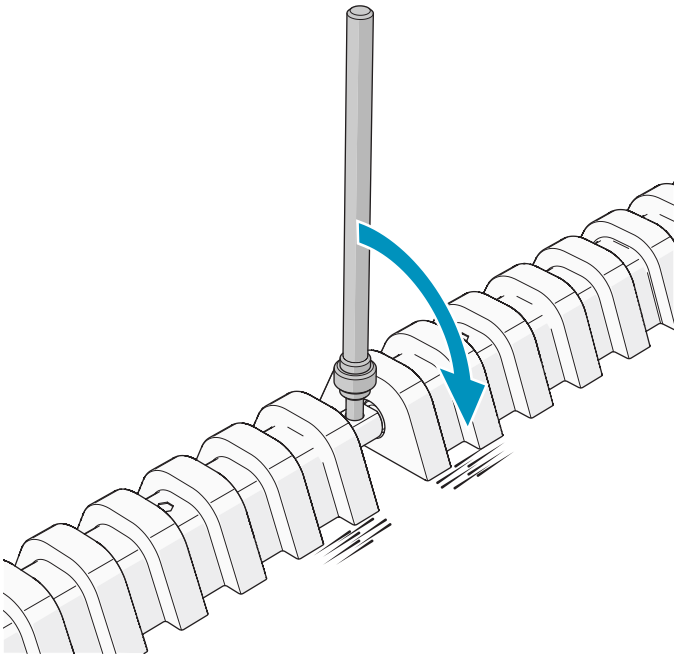
NOTICE	Ensure to tighten the Steel Connector only 1 turn for correct functioning of the system.



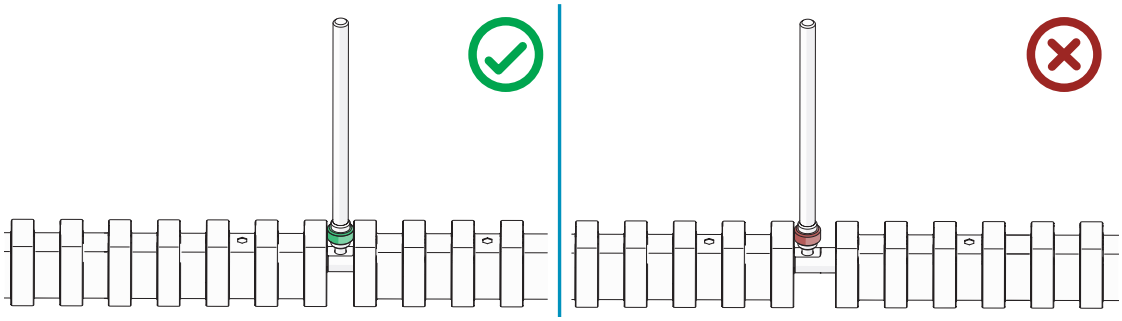
4. Slide the next rail onto the female side of the connector.



5. Tighten the Steel Connector clockwise with the Installation Tool.



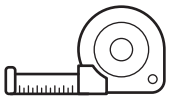
6. Continue tightening the Steel Connector until both rails are touching the ring of the Installation Tool and the hole of the Steel Connector is in the center of the gap. To test if the gap between the rails is acceptable, place a CoilWedge over the connection. The CoilWedge should fit without exerting any force.

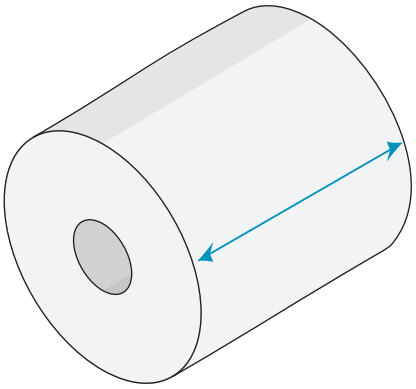


NOTICE

- Make sure the rails are parallel.
- Make sure the tops of the rails are aligned along the same line.

7. Measure the coil width.





8. You have two options securing the system:

Option A **Not connected to the floor**

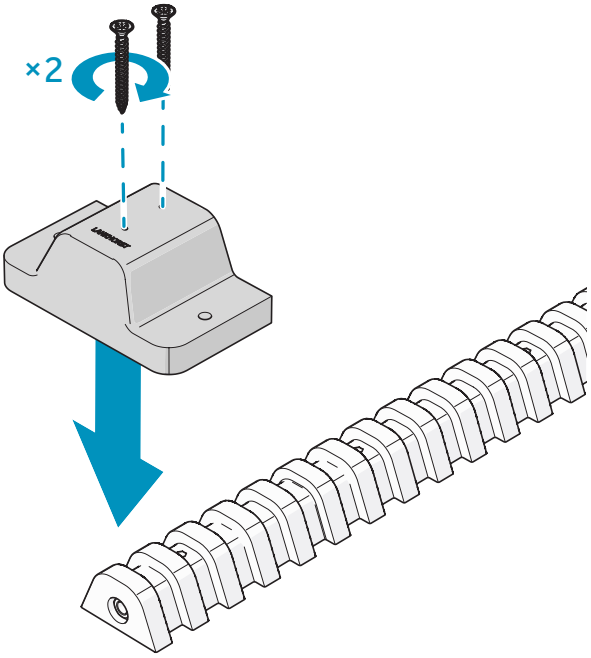
Option B **Connected to the floor**

If you choose the *not connected to the floor* option, proceed with **Option A**.
If you choose the *connected to the floor* option, proceed with **Option B**.

Option A: Not fastening the system to the floor.

a. Place the Endcap on the end of the rail.

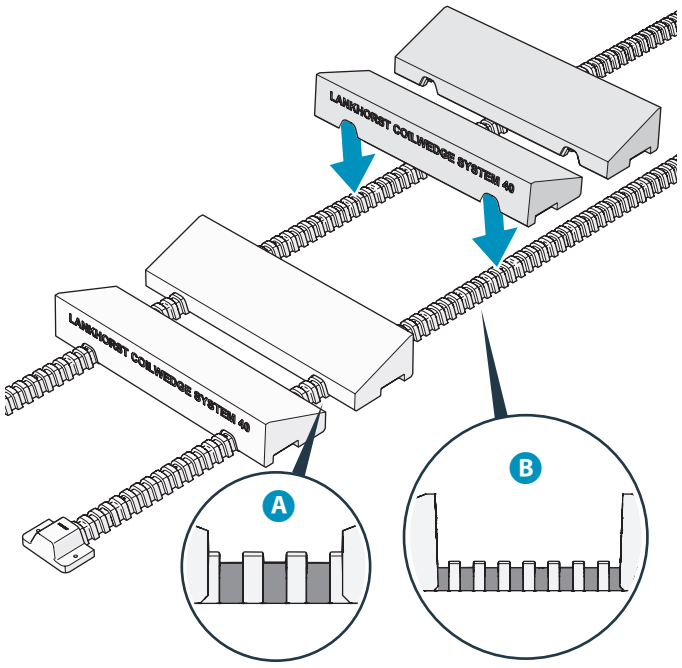
4×45mm



b. Place the CoilWedges at the intervals decided, check chapter 4.3 Determining the setup.

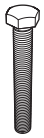
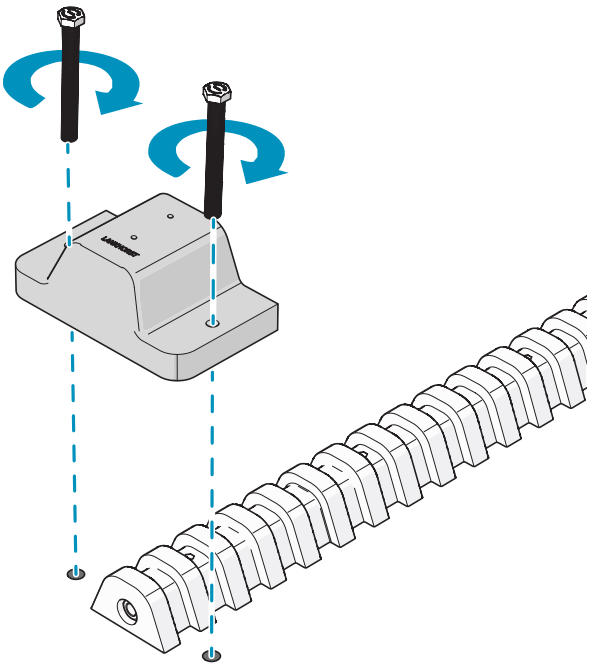
OR

Coilstacker Software



Option B: Fastening the system to the floor.

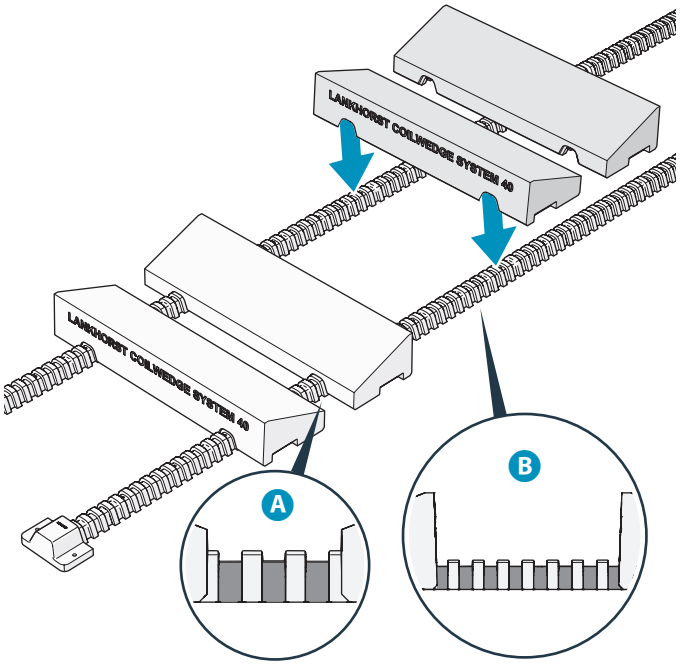
a. Place the Endcap on the end of the rail.
b. Mark the floor for drilling.
c. Drill holes to the floor.
d. Fix the Endcap to the floor with your chosen method based on the type of floor.

NOTICE	You can use chemical anchors with M12 bolts.
 M12	

e. Place the CoilWedges at the intervals decided, check chapter *4.3 Determining the setup*.

OR

Coilstacker Software



9. If necessary, place the CoilWedge Brackets on the ends of the CoilWedges that need to be extended.

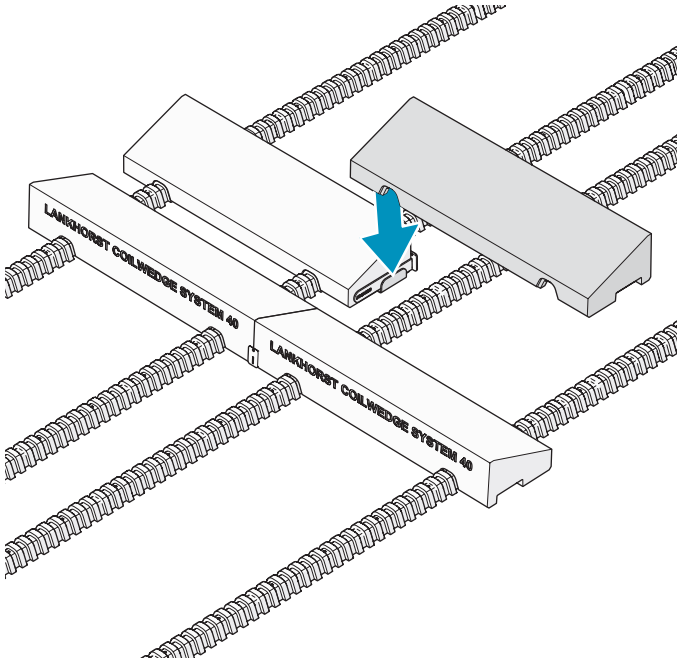
a. Place the rails at a distance matching with the CoilWedges being used.

b. Follow steps in **Option A** or **Option B** based on whether you want the system fixed to the floor or not.

c. Hold the CoilWedge Bracket on the first CoilWedge in place.

d. Place the CoilWedge with the CoilWedge Bracket on the rail.

e. Connect the second CoilWedge to the CoilWedge Bracket.



5 MAINTENANCE

⚠ CAUTION	**Risk of improper functionality of the system** Failure to maintain or inspect may result in system damage. Regularly inspect system components for damage or deformation, refer to **5.1 Periodic maintenance**.

5.1 Periodic maintenance

Regular maintenance helps extend the system's service life and increases safety during operation. Use the maintenance schedule in this section and the instructions in this chapter to properly maintain the system.

Part	Maintenance activity	Frequency	Instructions
CoilWedge	• Check for broken corners or edges. • Check for cuts, cracks or tears on the surface. • Check for permanent deformation that exceeds 10 mm (⅜") of the original geometry. • Check for loose material fragments. • Check if the component fits on the rail without applying force.	Monthly	Replace the component if a defect is found.
Endcap		When the setup is changed.	
Rail	• Check for broken corners or edges. • Check for cuts, cracks or tears on the surface. • Check for permanent deformation that exceeds 10 mm (⅜") of the original geometry. • Check for loose material fragments. • Check for corrosion.	Monthly	
Steel Connector	• Check for corrosion. • Check for cracks, tears and any visible deformation.	Monthly	
	• Check for broken thread. • Check if a CoilWedge fits over the gap with the steel connector without applying force.	When the setup is changed.	
CoilWedge Bracket	• Check for corrosion. • Check for cracks, tears and any visible deformation.	Monthly	

5.2 Spare parts

Only use parts produced by Lankhorst Engineered Products. The use of any other spare parts might compromise system safety.

5.3 Changing the setup

The stacking setup can be adjusted after installation if needed. The CoilWedges can be removed from the rail and relocated, provided they are undamaged. For any adjustments to CoilWedge placement or coil application, it is essential to follow the stacking guidelines provided in chapter **4.3 Determining the setup** or use the Coilstacker software.

6 DISPOSAL

	Separate and dispose the components of the system into the applicable waste streams based on their materials, in accordance with local regulations.

7 APPENDICES

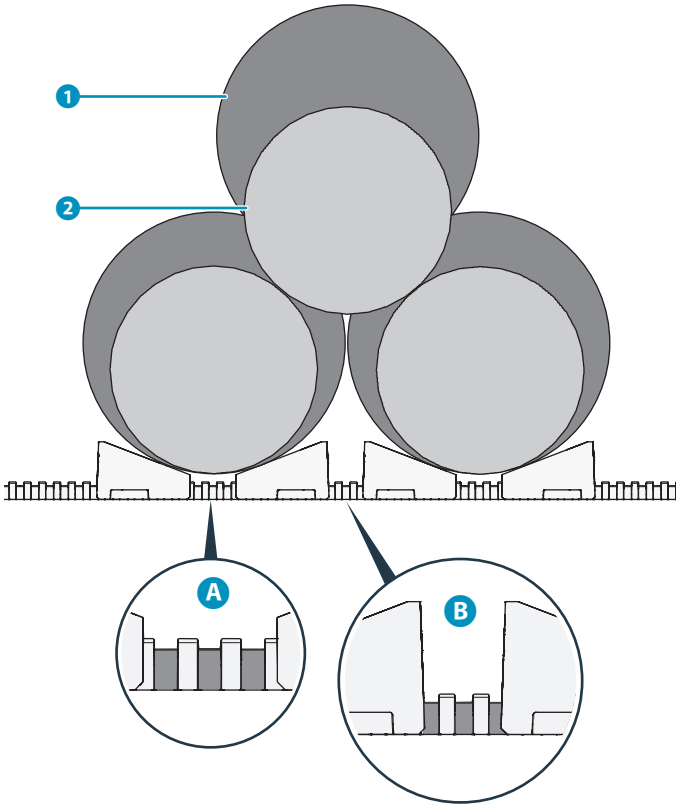
Appendix I. General specifications

Article number	Product name	Dimensions (w×d×h)		Mass		Material
		mm	ft/in	kg	lbs.	
253443	CoilWedge CWS40 120/34	1200 × 340 × 210	3' 11 ¼" × 1' 1 ⅜" × 8 ¼"	37.8	83 ⅜	Polyolefin
253445	CoilWedge CWS40 150/34	1500 × 340 × 210	4' 11 1/16" × 1' 1 ⅜" × 8 ¼"	46.5	102 ¼	Polyolefin
253444	CoilWedge CWS40 120/43	1200 × 430 × 210	3' 11 ¼" × 1' 4 ⅞" × 8 ¼"	48.6	107 ¼	Polyolefin
253446	CoilWedge CWS40 150/43	1500 × 430 × 210	4' 11 1/16" × 1' 4 ⅞" × 8 ¼"	59.3	130 ¾	Polyolefin
253132	Endcap RSS40	145 × 251 × 93	5 ¾" × 9 ⅞" × 3 ⅝"	1.3	2 ⅞	Polyolefin
252556	Installation Tool RSS40	–	–	0.5	1 ⅛	Stainless steel
252553	Steel Connector RSS40	Ø 28 × 90	Ø 1 ⅛" × 3 ½"	0.3	⅔	Steel
252559	Steel Connector RSS40	Ø 28 × 90	Ø 1 ⅛" × 3 ½"	0.3	⅔	Zinc coated steel
252552	Rail RSS40	4021 × 113 × 64	13' 2 ⅜" × 4 ½" × 2 ½"	25.1	55 ¼	Polyolefin/ steel reinforced
252558	Rail RSS40	4021 × 113 × 64	13' 2 ⅜" × 4 ½" × 2 ½"	25.1	55 ¼	Polyolefin / zinc coated steel reinforced
512268	CoilWedge Bracket CWS40	403 × 53 × 5	15 ⅞" × 2 1/16" × 3/16"	0.8	1 ¾	Zinc coated steel
512733	CoilWedge Bracket CWS40	80 × 50 × 5	3 ⅛" × 2" × 3/16"	0.8	1 ¾	Zinc coated steel

Appendix II. Coil stacking tables for CoilWedge System 40

This appendix contains all the possible settings for stacking coils using the CoilWedge System 40. Each setting is different based on the number of gaps at position Ⓐ and position Ⓑ. For each setting, the table shows the allowed minimum and maximum coil diameter, which applies to every layer.

Check **II.1** for the coil stacking tables with metric values and **II.2** for the coil stacking tables with imperial values.



1. Maximum diameter **2.** Minimum diameter	Ⓐ Number of gaps between the CoilWedges holding *the same* coil Ⓑ Number of gaps between the CoilWedges holding *adjacent* coils

II.1 Tables with metric values

Stacking table quick references (340 mm)				
No. of gaps Ⓐ	No. of gaps Ⓑ	Minimum diameter (mm)	Maximum diameter (mm)	Range (mm)
0	1	546	682	136
1	1	588	736	148
2	1	630	790	160
2	2	672	844	172
2	3	714	898	184
3	3	756	952	196
3	4	798	1006	208
3	5	840	1060	220
3	6	882	1114	232
4	6	924	1168	244
4	7	966	1222	256
4	8	1008	1276	268
4	9	1050	1330	280
5	9	1092	1384	292
5	10	1134	1438	304
5	11	1176	1492	316
5	12	1218	1546	328
5	13	1260	1600	340
5	14	1302	1654	352
6	14	1344	1708	364
6	15	1386	1762	376
6	16	1428	1816	388
6	17	1470	1870	400
6	18	1512	1924	412
6	19	1554	1978	424
6	20	1596	2032	436
7	20	1638	2086	448
7	21	1680	2140	460
7	22	1722	2194	472
7	23	1764	2248	484
7	24	1806	2302	496
7	25	1848	2356	508
7	26	1890	2410	520
8	26	1932	2464	532
8	27	1974	2500	526

Stacking table all possibilities (340mm)				
No. of gaps Ⓐ	No. of gaps Ⓑ	Minimum diameter (mm)	Maximum diameter (mm)	Range (mm)
0	1	546	682	136
0	2	588	736	148
0	3	630	790	160
0	4	672	844	172
0	5	714	898	184
0	6	756	952	196
0	7	798	1006	208
0	8	840	1060	220
0	9	882	1114	232
0	10	924	1168	244
0	11	966	1222	256
0	12	1008	1276	268
0	13	1050	1330	280
0	14	1092	1384	292
1	1	588	736	148
1	2	630	790	160
1	3	672	844	172
1	4	714	898	184
1	5	756	952	196
1	6	798	1006	208
1	7	840	1060	220
1	8	882	1114	232
1	9	924	1168	244
1	10	966	1222	256
1	11	1008	1276	268
1	12	1050	1330	280
1	13	1092	1384	292
1	14	1134	1438	304
1	15	1176	1492	316
1	16	1218	1546	328
2	1	630	790	160
2	2	672	844	172
2	3	714	898	184
2	4	756	952	196
2	5	798	1006	208
2	6	840	1060	220

Stacking table all possibilities (340mm)				
No. of gaps Ⓐ	No. of gaps Ⓑ	Minimum diameter (mm)	Maximum diameter (mm)	Range (mm)
2	7	882	1114	232
2	8	924	1168	244
2	9	966	1222	256
2	10	1008	1276	268
2	11	1050	1330	280
2	12	1092	1384	292
2	13	1134	1438	304
2	14	1176	1492	316
2	15	1218	1546	328
2	16	1260	1600	340
2	17	1302	1654	352
2	18	1344	1708	364
3	2	751	898	147
3	3	756	952	196
3	4	798	1006	208
3	5	840	1060	220
3	6	882	1114	232
3	7	924	1168	244
3	8	966	1222	256
3	9	1008	1276	268
3	10	1050	1330	280
3	11	1092	1384	292
3	12	1134	1438	304
3	13	1176	1492	316
3	14	1218	1546	328
3	15	1260	1600	340
3	16	1302	1654	352
3	17	1344	1708	364
3	18	1386	1762	376
3	19	1428	1816	388
4	5	901	1114	213
4	6	924	1168	244
4	7	966	1222	256
4	8	1008	1276	268
4	9	1050	1330	280

Stacking table all possibilities (340mm)				
No. of gaps Ⓐ	No. of gaps Ⓑ	Minimum diameter	Maximum diameter	Range
		(mm)	(mm)	(mm)
4	10	1092	1384	292
4	11	1134	1438	304
4	12	1176	1492	316
4	13	1218	1546	328
4	14	1260	1600	340
4	15	1302	1654	352
4	16	1344	1708	364
4	17	1386	1762	376
4	18	1428	1816	388
4	19	1470	1870	400
4	20	1512	1924	412
4	21	1554	1978	424
5	8	1052	1330	278
5	9	1092	1384	292
5	10	1134	1438	304
5	11	1176	1492	316
5	12	1218	1546	328
5	13	1260	1600	340
5	14	1302	1654	352
5	15	1344	1708	364
5	16	1386	1762	376
5	17	1428	1816	388
5	18	1470	1870	400
5	19	1512	1924	412
5	20	1554	1978	424
5	21	1596	2032	436
5	22	1638	2086	448
5	23	1680	2140	460
6	13	1336	1654	318
6	14	1344	1708	364
6	15	1386	1762	376
6	16	1428	1816	388
6	17	1470	1870	400
6	18	1512	1924	412
6	19	1554	1978	424

Stacking table all possibilities (340mm)				
No. of gaps Ⓐ	No. of gaps Ⓑ	Minimum diameter (mm)	Maximum diameter (mm)	Range (mm)
6	20	1596	2032	436
6	21	1638	2086	448
6	22	1680	2140	460
6	23	1722	2194	472
6	24	1764	2248	484
6	25	1806	2302	496
7	20	1638	2086	448
7	21	1680	2140	460
7	22	1722	2194	472
7	23	1764	2248	484
7	24	1806	2302	496
7	25	1848	2356	508
7	26	1890	2410	520
8	26	1932	2464	532
8	27	1974	2500	526

Stacking table quick references (430 mm)				
No. of gaps Ⓐ	No. of gaps Ⓑ	Minimum diameter (mm)	Maximum diameter (mm)	Range (mm)
0	1	714	898	184
1	1	756	952	196
2	1	798	1006	208
3	1	840	1060	220
3	2	882	1114	232
4	2	924	1168	244
4	3	966	1222	256
4	4	1008	1276	268
5	4	1052	1330	278
5	5	1092	1384	292
5	6	1134	1438	304
5	7	1176	1492	316
5	8	1218	1546	328
5	9	1260	1600	340
5	10	1302	1654	352
6	10	1344	1708	364
6	11	1386	1762	376

Stacking table quick references (430 mm)				
No. of gaps Ⓐ	No. of gaps Ⓑ	Minimum diameter	Maximum diameter	Range
		(mm)	(mm)	(mm)
6	12	1428	1816	388
6	13	1470	1870	400
6	14	1512	1924	412
6	15	1554	1978	424
6	16	1596	2032	436
7	16	1638	2086	448
7	17	1680	2140	460
7	18	1722	2194	472
7	19	1764	2248	484
7	20	1806	2302	496
7	21	1848	2356	508
7	22	1890	2410	520
7	23	1932	2464	532
7	24	1974	2500	526

Stacking table all possibilities (430 mm)				
No. of gaps Ⓐ	No. of gaps Ⓑ	Minimum diameter	Maximum diameter	Range
		(mm)	(mm)	(mm)
0	1	714	898	184
0	2	756	952	196
0	3	798	1006	208
0	4	840	1060	220
0	5	882	1114	232
0	6	924	1168	244
0	7	966	1222	256
0	8	1008	1276	268
0	9	1050	1330	280
0	10	1092	1384	292
1	1	756	952	196
1	2	798	1006	208
1	3	840	1060	220
1	4	882	1114	232
1	5	924	1168	244
1	6	966	1222	256
1	7	1008	1276	268
1	8	1050	1330	280
1	9	1092	1384	292
1	10	1134	1438	304
1	11	1176	1492	316
1	12	1218	1546	328
2	1	798	1006	208
2	2	840	1060	220
2	3	882	1114	232
2	4	924	1168	244
2	5	966	1222	256
2	6	1008	1276	268
2	7	1050	1330	280
2	8	1092	1384	292
2	9	1134	1438	304
2	10	1176	1492	316
2	11	1218	1546	328
2	12	1260	1600	340
2	13	1302	1654	352
2	14	1344	1708	364

Stacking table all possibilities (430 mm)				
No. of gaps Ⓐ	No. of gaps Ⓑ	Minimum diameter	Maximum diameter	Range
		(mm)	(mm)	(mm)
3	1	840	1060	220
3	2	882	1114	232
3	3	924	1168	244
3	4	966	1222	256
3	5	1008	1276	268
3	6	1050	1330	280
3	7	1092	1384	292
3	8	1134	1438	304
3	9	1176	1492	316
3	10	1218	1546	328
3	11	1260	1600	340
3	12	1302	1654	352
3	13	1344	1708	364
3	14	1386	1762	376
3	15	1428	1816	388
4	1	901	1114	213
4	2	924	1168	244
4	3	966	1222	256
4	4	1008	1276	268
4	5	1050	1330	280
4	6	1092	1384	292
4	7	1134	1438	304
4	8	1176	1492	316
4	9	1218	1546	328
4	10	1260	1600	340
4	11	1302	1654	352
4	12	1344	1708	364
4	13	1386	1762	376
4	14	1428	1816	388
4	15	1470	1870	400
4	16	1512	1924	412
4	17	1554	1978	424
5	4	1052	1330	278
5	5	1092	1384	292
5	6	1134	1438	304
5	7	1176	1492	316

Stacking table all possibilities (430 mm)				
No. of gaps Ⓐ	No. of gaps Ⓑ	Minimum diameter	Maximum diameter	Range
		(mm)	(mm)	(mm)
5	8	1218	1546	328
5	9	1260	1600	340
5	10	1302	1654	352
5	11	1344	1708	364
5	12	1386	1762	376
5	13	1428	1816	388
5	14	1470	1870	400
5	15	1512	1924	412
5	16	1554	1978	424
5	17	1596	2032	436
5	18	1638	2086	448
5	19	1680	2140	460
6	9	1336	1654	318
6	10	1344	1708	364
6	11	1386	1762	376
6	12	1428	1816	388
6	13	1470	1870	400
6	14	1512	1924	412
6	15	1554	1978	424
6	16	1596	2032	436
6	17	1638	2086	448
6	18	1680	2140	460
6	19	1722	2194	472
6	20	1764	2248	484
6	21	1806	2302	496
7	16	1638	2086	448
7	17	1680	2140	460
7	18	1722	2194	472
7	19	1764	2248	484
7	20	1806	2302	496
7	21	1848	2356	508
7	22	1890	2410	520
7	23	1932	2464	532
7	24	1974	2500	526

II.2 Tables with imperial values

Stacking table quick references (340 mm)				
No. of gaps Ⓐ	No. of gaps Ⓑ	Minimum diameter (ft/in)	Maximum diameter (ft/in)	Range (ft/in)
0	1	1' 9 ½"	2' 2 ⅞"	5 ⅜"
1	1	1' 11 ⅛"	2' 5"	5 ⅘"
2	1	2' ⅘"	2' 7 ⅛"	6 ⅓"
2	2	2' 2 ⅘"	2' 9 ¼"	6 ¾"
2	3	2' 4 ⅛"	2' 11 ⅜"	7 ¼"
3	3	2' 5 ¾"	3' 1 ½"	7 ⅔"
3	4	2' 7 ⅘"	3' 3 ⅝"	8 ⅕"
3	5	2' 9"	3' 5 ¾"	8 ⅔"
3	6	2' 10 ¾"	3' 7 ⅞"	9 ⅛"
4	6	3' ⅜"	3' 10"	9 ⅝"
4	7	3' 2"	4' ⅛"	10"
4	8	3' 3 ⅔"	4' 2 ¼"	10 ⅘"
4	9	3' 5 ⅓"	4' 4 ⅜"	11"
5	9	3' 7"	4' 6 ½"	11 ½"
5	10	3' 8 ⅝"	4' 8 ⅝"	11 15⁄16"
5	11	3' 10 ⅓"	4' 10 ¾"	1' ⅘"
5	12	3' 11 15⁄16"	5' ⅞"	1' 15⁄16"
5	13	4' 1 ⅝"	5' 3"	1' 1 ⅜"
5	14	4' 3 ¼"	5' 5 ⅛"	1' 1 ⅞"
6	14	4' 4 15⁄16"	5' 7 ¼"	1' 2 ⅓"
6	15	4' 6 ⅘"	5' 9 ⅜"	1' 2 ⅘"
6	16	4' 8 ¼"	5' 11 ½"	1' 3 ¼"
6	17	4' 9 ⅞"	6' 1 ⅝"	1' 3 ¾"
6	18	4' 11 ½"	6' 3 ¾"	1' 4 ¼"
6	19	5' 1 ⅕"	6' 5 ⅞"	1' 4 ⅔"
6	20	5' 2 ⅘"	6' 8"	1' 5 ⅕"
7	20	5' 4 ½"	6' 10 ⅛"	1' 5 ⅝"
7	21	5' 6 ⅛"	7' ¼"	1' 6 ⅛"
7	22	5' 7 ⅘"	7' 2 ⅜"	1' 6 ⅘"
7	23	5' 9 ⅘"	7' 4 ½"	1' 7 1⁄16"
7	24	5' 11 ⅛"	7' 6 ⅝"	1' 7 ½"
7	25	6' ¾"	7' 8 ¾"	1' 8"
7	26	6' 2 ⅘"	7' 10 ⅞"	1' 8 ½"
8	26	6' 4"	8' 1"	1' 8 15⁄16"
8	27	6' 5 ⅔"	8' 2 ⅘"	1' 8 ⅔"

Stacking table all possibilities (340 mm)				
No. of gaps Ⓐ	No. of gaps Ⓑ	Minimum diameter (ft/in)	Maximum diameter (ft/in)	Range (ft/in)
0	1	1' 9 ½"	2' 2 7/8"	5 3/8"
0	2	1' 11 1/8"	2' 5"	5 4/5"
0	3	2' 4/5"	2' 7 1/8"	6 1/3"
0	4	2' 2 4/9"	2' 9 1/4"	6 3/4"
0	5	2' 4 1/8"	2' 11 3/8"	7 1/4"
0	6	2' 5 3/4"	3' 1 ½"	7 2/3"
0	7	2' 7 4/9"	3' 3 5/8"	8 1/5"
0	8	2' 9"	3' 5 3/4"	8 2/3"
0	9	2' 10 3/4"	3' 7 7/8"	9 1/8"
0	10	3' 3/8"	3' 10"	9 5/8"
0	11	3' 2"	4' 0 1/8"	10"
0	12	3' 3 2/3"	4' 2 1/4"	10 4/7"
0	13	3' 5 1/3"	4' 4 3/8"	11"
0	14	3' 7"	4' 6 ½"	11 ½"
1	1	1' 11 1/8"	2' 5"	5 4/5"
1	2	2' 4/5"	2' 7 1/8"	6 1/3"
1	3	2' 2 4/9"	2' 9 1/4"	6 3/4"
1	4	2' 4 1/8"	2' 11 3/8"	7 1/4"
1	5	2' 5 3/4"	3' 1 ½"	7 2/3"
1	6	2' 7 4/9"	3' 3 5/8"	8 1/5"
1	7	2' 9"	3' 5 3/4"	8 2/3"
1	8	2' 10 3/4"	3' 7 7/8"	9 1/8"
1	9	3' 3/8"	3' 10"	9 5/8"
1	10	3' 2"	4' 1/8"	10"
1	11	3' 3 2/3"	4' 2 1/4"	10 4/7"
1	12	3' 5 1/3"	4' 4 3/8"	11"
1	13	3' 7"	4' 6 ½"	11 ½"
1	14	3' 8 5/8"	4' 8 5/8"	11 15/16"
1	15	3' 10 1/3"	4' 10 3/4"	1' 4/9"
1	16	3' 11 15/16"	5' 7/8"	1' 15/16"
2	1	2' 0 4/5"	2' 7 1/8"	6 1/3"
2	2	2' 2 4/9"	2' 9 1/4"	6 3/4"
2	3	2' 4 1/8"	2' 11 3/8"	7 1/4"
2	4	2' 5 3/4"	3' 1 ½"	7 2/3"
2	5	2' 7 4/9"	3' 3 5/8"	8 1/5"

Stacking table all possibilities (340 mm)				
No. of gaps Ⓐ	No. of gaps Ⓑ	Minimum diameter (ft/in)	Maximum diameter (ft/in)	Range (ft/in)
2	6	2' 9"	3' 5 ¾"	8 ⅔"
2	7	2' 10 ¾"	3' 7 ⅞"	9 ⅛"
2	8	3' ⅜"	3' 10"	9 ⅝"
2	9	3' 2"	4' ⅛"	10"
2	10	3' 3 ⅔"	4' 2 ¼"	10 ⅘"
2	11	3' 5 ⅓"	4' 4 ⅜"	11"
2	12	3' 7"	4' 6 ½"	11 ½"
2	13	3' 8 ⅝"	4' 8 ⅝"	11 15⁄16"
2	14	3' 10 ⅓"	4' 10 ¾"	1' ⅘"
2	15	3' 11 15⁄16"	5' ⅞"	1' 15⁄16"
2	16	4' 1 ⅝"	5' 3"	1' 1 ⅜"
2	17	4' 3 ¼"	5' 5 ⅛"	1' 1 ⅞"
2	18	4' 4 15⁄16"	5' 7 ¼"	1' 2 ⅓"
3	2	2' 5 ⅘"	2' 11 ⅜"	5 ⅘"
3	3	2' 5 ¾"	3' 1 ½"	7 ⅔"
3	4	2' 7 ⅘"	3' 3 ⅝"	8 ⅕"
3	5	2' 9"	3' 5 ¾"	8 ⅔"
3	6	2' 10 ¾"	3' 7 ⅞"	9 ⅛"
3	7	3' ⅜"	3' 10"	9 ⅝"
3	8	3' 2"	4' ⅛"	10"
3	9	3' 3 ⅔"	4' 2 ¼"	10 ⅘"
3	10	3' 5 ⅓"	4' 4 ⅜"	11"
3	11	3' 7"	4' 6 ½"	11 ½"
3	12	3' 8 ⅝"	4' 8 ⅝"	11 15⁄16"
3	13	3' 10 ⅓"	4' 10 ¾"	1' ⅘"
3	14	3' 11 15⁄16"	5' ⅞"	1' 15⁄16"
3	15	4' 1 ⅝"	5' 3"	1' 1 ⅜"
3	16	4' 3 ¼"	5' 5 ⅛"	1' 1 ⅞"
3	17	4' 4 15⁄16"	5' 7 ¼"	1' 2 ⅓"
3	18	4' 6 ⅘"	5' 9 ⅜"	1' 2 ⅘"
3	19	4' 8 ¼"	5' 11 ½"	1' 3 ¼"
4	5	2' 11 ½"	3' 7 ⅞"	8 ⅜"
4	6	3' ⅜"	3' 10"	9 ⅝"
4	7	3' 2"	4' ⅛"	10"
4	8	3' 3 ⅔"	4' 2 ¼"	10 ⅘"

Stacking table all possibilities (340 mm)				
No. of gaps Ⓐ	No. of gaps Ⓑ	Minimum diameter (ft/in)	Maximum diameter (ft/in)	Range (ft/in)
4	9	3' 5 ⅓"	4' 4 ⅜"	11"
4	10	3' 7"	4' 6 ½"	11 ½"
4	11	3' 8 ⅝"	4' 8 ⅝"	11 15/16"
4	12	3' 10 ⅓"	4' 10 ¾"	1' 4/9"
4	13	3' 11 15/16"	5' ⅞"	1' 1"
4	14	4' 1 ⅝"	5' 3"	1' 1 ⅜"
4	15	4' 3 ¼"	5' 5 ⅛"	1' 1 ⅞"
4	16	4' 4 15/16"	5' 7 ¼"	1' 2 ⅓"
4	17	4' 6 4/7"	5' 9 ⅜"	1' 2 ⅘"
4	18	4' 8 ¼"	5' 11 ½"	1' 3 ¼"
4	19	4' 9 ⅞"	6' 1 ⅝"	1' 3 ¾"
4	20	4' 11 ½"	6' 3 ¾"	1' 4 ¼"
4	21	5' 1 ⅕"	6' 5 ⅞"	1' 4 ⅔"
5	8	3' 5 4/9"	4' 4 ⅜"	10 15/16"
5	9	3' 7"	4' 6 ½"	11 ½"
5	10	3' 8 ⅝"	4' 8 ⅝"	11 15/16"
5	11	3' 10 ⅓"	4' 10 ¾"	1' 4/9"
5	12	3' 11 15/16"	5' ⅞"	1' 15/16"
5	13	4' 1 ⅝"	5' 3"	1' 1 ⅜"
5	14	4' 3 ¼"	5' 5 ⅛"	1' 1 ⅞"
5	15	4' 4 15/16"	5' 7 ¼"	1' 2 ⅓"
5	16	4' 6 4/7"	5' 9 ⅜"	1' 2 ⅘"
5	17	4' 8 ¼"	5' 11 ½"	1' 3 ¼"
5	18	4' 9 ⅞"	6' 1 ⅝"	1' 3 ¾"
5	19	4' 11 ½"	6' 3 ¾"	1' 4 ¼"
5	20	5' 1 ⅕"	6' 5 ⅞"	1' 4 ⅔"
5	21	5' 2 ⅘"	6' 8"	1' 5 ⅕"
5	22	5' 4 ½"	6' 10 ⅛"	1' 5 ⅝"
5	23	5' 6 ⅛"	7' ¼"	1' 6 ⅛"
6	13	4' 4 ⅝"	5' 5 ⅛"	1' ½"
6	14	4' 4 15/16"	5' 7 ¼"	1' 2 ⅓"
6	15	4' 6 4/7"	5' 9 ⅜"	1' 2 ⅘"
6	16	4' 8 ¼"	5' 11 ½"	1' 3 ¼"
6	17	4' 9 ⅞"	6' 1 ⅝"	1' 3 ¾"

Stacking table all possibilities (340 mm)				
No. of gaps Ⓐ	No. of gaps Ⓑ	Minimum diameter (ft/in)	Maximum diameter (ft/in)	Range (ft/in)
6	18	4' 11 ½"	6' 3 ¾"	1' 4 ¼"
6	19	5' 1 ⅕"	6' 5 ⅞"	1' 4 ⅔"
6	20	5' 2 ⅘"	6' 8"	1' 5 ⅕"
6	21	5' 4 ½"	6' 10 ⅛"	1' 5 ⅝"
6	22	5' 6 ⅛"	7' ¼"	1' 6 ⅛"
6	23	5' 7 ⅘"	7' 2 ⅜"	1' 6 ⁴⁄₇"
6	24	5' 9 ⁴⁄₉"	7' 4 ½"	1' 7 0 "
6	25	5' 11 ⅛"	7' 6 ⅝"	1' 7 ½"
7	20	5' 4 ½"	6' 10 ⅛"	1' 5 ⅝"
7	21	5' 6 ⅛"	7' 0 ¼"	1' 6 ⅛"
7	22	5' 7 ⅘"	7' 2 ⅜"	1' 6 ⁴⁄₇"
7	23	5' 9 ⁴⁄₉"	7' 4 ½"	1' 7"
7	24	5' 11 ⅛"	7' 6 ⅝"	1' 7 ½"
7	25	6' 0 ¾"	7' 8 ¾"	1' 8"
7	26	6' 2 ⁴⁄₉"	7' 10 ⅞"	1' 8 ½"
8	26	6' 4"	8' 1"	1' 8 ¹⁵⁄₁₆"
8	27	6' 5 ⅔"	8' 2 ⁴⁄₉"	1' 8 ⅔"

Stacking table quick references (430 mm)				
No. of gaps Ⓐ	No. of gaps Ⓑ	Minimum diameter (ft/in)	Maximum diameter (ft/in)	Range (ft/in)
0	1	2' 4 ⅛"	2' 11 ⅜"	0' 7 ¼"
1	1	2' 5 ¾"	3' 1 ½"	0' 7 ⅔"
2	1	2' 7 ⁴⁄₉"	3' 3 ⅝"	0' 8 ⅕"
3	1	2' 9"	3' 5 ¾"	0' 8 ⅔"
3	2	2' 10 ¾"	3' 7 ⅞"	0' 9 ⅛"
4	2	3' ⅜"	3' 10"	0' 9 ⅝"
4	3	3' 2"	4' ⅛"	0' 10 0 "
4	4	3' 3 ⅔"	4' 2 ¼"	0' 10 ⁴⁄₇"
5	4	3' 5 ⁴⁄₉"	4' 4 ⅜"	0' 10 ¹⁵⁄₁₆"
5	5	3' 7"	4' 6 ½"	0' 11 ½"
5	6	3' 8 ⅝"	4' 8 ⅝"	0' 11 ¹⁵⁄₁₆"
5	7	3' 10 ⅓"	4' 10 ¾"	1' 0 ⁴⁄₉"
5	8	3' 11 ¹⁵⁄₁₆"	5' ⅞"	1' 0 ¹⁵⁄₁₆"

Stacking table quick references (430 mm)				
No. of gaps Ⓐ	No. of gaps Ⓑ	Minimum diameter	Maximum diameter	Range
		(ft/in)	(ft/in)	(ft/in)
5	9	4' 1 5/8"	5' 3"	1' 1 3/8"
5	10	4' 3 1/4"	5' 5 1/8"	1' 1 7/8"
6	10	4' 4 15/16"	5' 7 1/4"	1' 2 1/3"
6	11	4' 6 4/7"	5' 9 3/8"	1' 2 4/5"
6	12	4' 8 1/4"	5' 11 1/2"	1' 3 1/4"
6	13	4' 9 7/8"	6' 1 5/8"	1' 3 3/4"
6	14	4' 11 1/2"	6' 3 3/4"	1' 4 1/4"
6	15	5' 1 1/5"	6' 5 7/8"	1' 4 2/3"
6	16	5' 2 4/5"	6' 8 0 "	1' 5 1/5"
7	16	5' 4 1/2"	6' 10 1/8"	1' 5 5/8"
7	17	5' 6 1/8"	7' 0 1/4"	1' 6 1/8"
7	18	5' 7 4/5"	7' 2 3/8"	1' 6 4/7"
7	19	5' 9 4/9"	7' 4 1/2"	1' 7 0 "
7	20	5' 11 1/8"	7' 6 5/8"	1' 7 1/2"
7	21	6' 0 3/4"	7' 8 3/4"	1' 8 0 "
7	22	6' 2 4/9"	7' 10 7/8"	1' 8 1/2"
7	23	6' 4 0 "	8' 1 0 "	1' 8 15/16"
7	24	6' 5 2/3"	8' 2 4/9"	1' 8 2/3"

EN – original instructions

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