

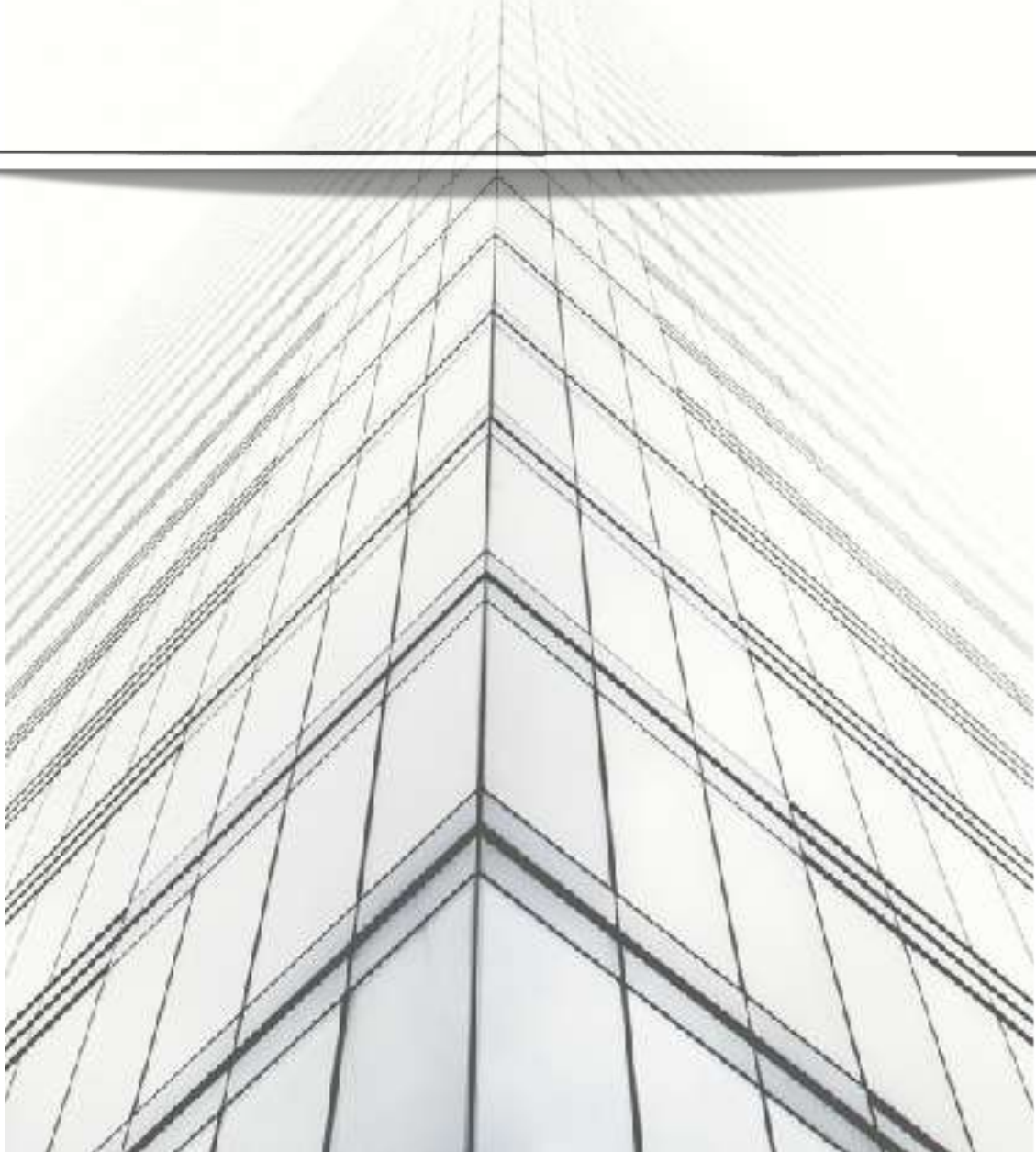


LE CLOU S.V.A

FABRIQUÉ EN FRANCE

TECHNICAL NOTICE
ANCHOR NAIL
SPACER

REF. C.E.M22



RESEARCH & DEVELOPMENT

www.leclou-sva.fr

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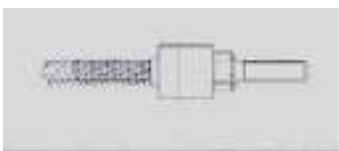


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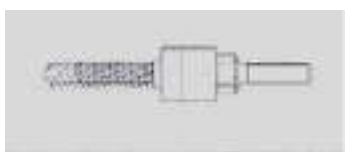
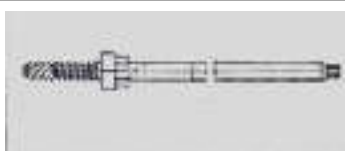


THE DIFFERENT TYPES OF ANCHOR NAILS

1



1.1 Nomenclature

	Anchor Nail	Name	Ref.	Shoulder	Ø Shoulder	Ø Metric thread	Total Length
1		SAFETY LINE	C.LDV	YES	60 mm	M22	29,7 cm
3		PLATE-FORME ET AGRES (INSERT)	C.I.PL.F.A. M22	YES	40 mm	M22	14,0 cm
4		SPACER	C.E.M22	NO	/	M22	20,5 cm

	Anchor Nail	Name	Ref.	Use
1		SAFETY LINE	C.LDV	Connections of Safety Lines and other critical applications (eg: heavy elements, stay lines, tree houses, ...) Reference Notice : NT-C.LDV
2		PLATFORMS AND ELEMENTS	CPTFA V1	Connections of platforms structures and support wire ropes. Reference Notice : NT-CPTFA
3		PLATEFORMS AND ELEMENTS (INSERT)	C.I.PL.F.A. M22	Connections of platforms structures (including tree houses) and support wire ropes Reference Notice : NT-C.I.PL.F.A M22
4		SPACER	C.E.M22	<ul style="list-style-type: none"> - Avoid contact between a wire rope and support tree. - Keep the height of a safety line buckle. - Connections of support wire ropes. Reference Notice : NT-C.E.M22

1.2 The Anchor Nail Spacer

Wood thread (with high fins).

Washers



Bolt Nut

MOUNTING THE ANCHOR NAIL SPACER

2



2.1 Foreword

Make sure the Anchor Nail being installed is the one described in this document.

The Anchor Nail Spacer shall be installed in a healthy tree inspected annually by a tree expert.

The Anchor Nail Spacer shall not be installed in a tree whose diameter is below 25cm.

The Anchor Nail Spacer shall not be used for safety line connection or any other critical application (with an exception on mounting defined in §3.4).

2.2 Tooling

The tools required to install the anchor nail Spacer are the following:

- 1x Spray with disinfectant solution (Eg: DAKIN, MILTON, ...)
- 1x Screwdriver.
- 1x 18mm Drill bit.
- 1x Graduated steel rule or measuring tape.
- 1x Pencil.
- 2x M22 Nut (Nut + Safety Nut) to tighten the Anchor Nail.
- 1x Open-end wrench M32 (or socket for powered wrench).
- 1x pot of vaseline

2.3 Mounting Steps

1. **Anchor Nail Position:** Using a pencil, note the final position of the anchor Nail.
2. **Drill bit disinfection:** Using the spray bottle containing the disinfectant solution, spray the drill bit.
3. **Drilling:** At the place defined for the position of the anchor nail, drill the support tree.

NOTE 1: Drilling shall always be done in the direction of the tree center, in the direction where the tree's diameter is the largest.

It is recommended that the nail be installed to work in the main axis of the applied load. A slight inclination may be required.

NOTE 2: Attention, in case of presence of black shavings, do not continue the operation. It is a good indicator to show that the tree is sick and/or dying.

NOTE 3: For optimal hold of the Anchor Nail, it is recommended to let the metric part protrude by 7cm from the bark of the tree.

4. **Wood-chips Evacuation:** Evacuate the remaining wood-chips in the drilled hole.
5. **Anchor Nail Desinfection :** Using the spray bottle containing the disinfectant solution, spray the anchor nail part which is going to be inserted into the support tree.
6. **Anchor Nail Screwing:** Start to screw the Anchor Nail into the tree by hand tightening (check orientation for the last time). Once correctly positioned, place the two nuts in contact and screw the Anchor Nail using the open-end wrench (or socket for powered wrench) 32.

2.4 Connectors

Depending the Application for the Anchor Nail, connectors to be installed shall be adapted.

These connectors can be (non-exhaustive list):

- Specific plate to maintain a wire rope height.
- Lifting eye.
- Junction Link.
- Chain.
- ...



Examples of connectors

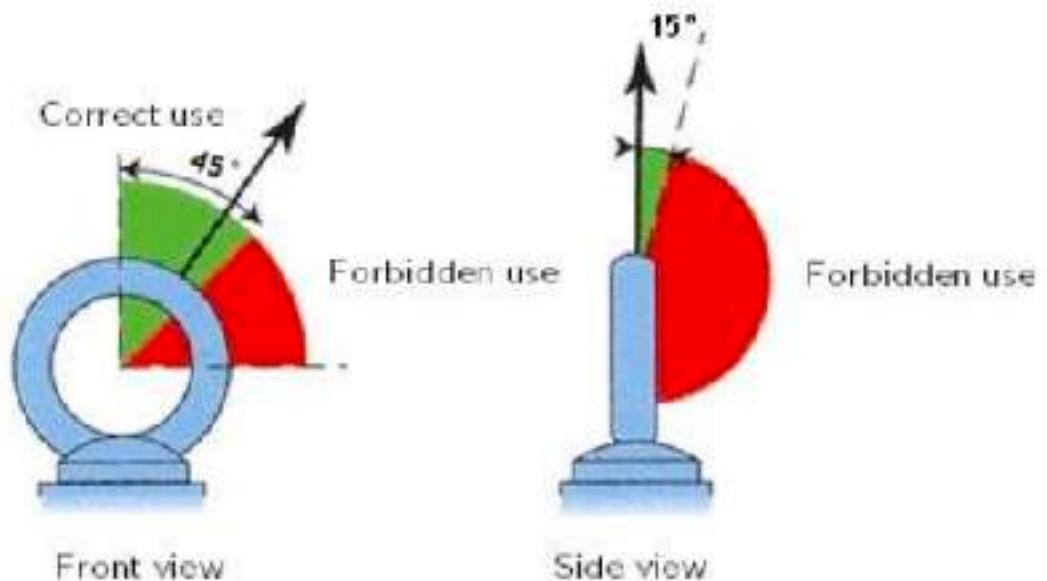
The Working Load Limit (WLL) of the connector must be adapted to the tension of the cable to which the connector is applied (Working Load).

It is possible to have several different connectors attached to the same nail. They must all meet the same requirement in terms of minimum WLL.

NOTE 1: For connectors screwed on an Anchor Nail's extremity (Eg: safety nut, ...) it is recommended to apply a thread lock, locknuts (outside) or a second nut (inside/acting as locknut). Nuts must be placed in contact with the connector.



NOTE 2: When using a lifting eye, good practices as described in the figure below shall be considered:



NOTE 3: It is advisable to use the hardware that has been supplied by LE CLOU SVA with the equipment purchased, because they have mechanical properties adapted to their use. If you wish to use your own hardware (in the event of loss of the hardware supplied or other), contact LE CLOU SVA to pick hardware with equivalent properties.

Please refer anyway to the connector's technical notice which defines the limits of use.

LIMITS OF USE

3



3.1 General Informations

Anchor Nails installation shall comply with this notice requirements.

LE CLOU S.V.A cannot be considered responsible for the consequences of an installation deviating from the guidelines of this notice and/or validated by an inaugural inspection before

Batch number is located at the Anchor Nail's ending (See picture below)

opening.



NOTE: For any reasons, if the metric thread part must be cut, the batch number of the nail will no longer be visible and shall be written on the site maintenance logbook.

3.2 Conception and Construction

The installations for which the anchor nails are used must comply with the requirement of the Norm EN 15 567-1.

3.3 Use of the Anchor Nail to maintain a wire rope

The Anchor nail SPACER can be used to avoid contact between a wire rope and the tree or to maintain the height of the wire rope.

The considered wire rope could be a back-up wire rope or a safety line buckle/loop.

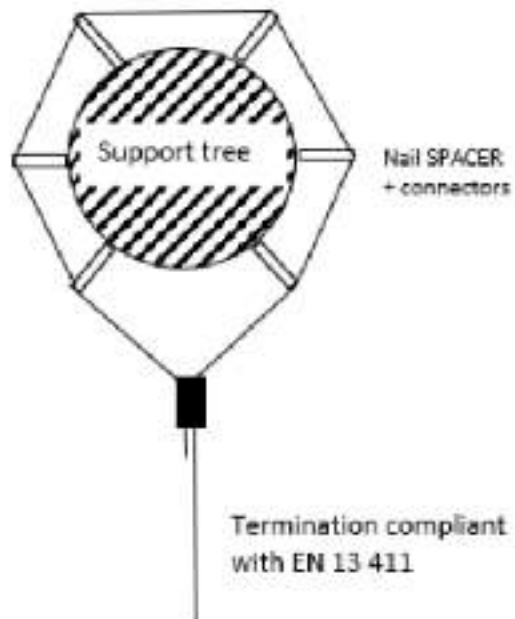
For this application, a specific Plate (see picture below) is used with the Anchor Nail for wire rope connections thanks to a wire clamp.

In both case, the Anchor Nail SPACER is used IN ADDITION of an Anchor Nail for SAFETY LINE.



3.4 Use of the Anchor Nail for wire rope connections

The Anchor Nail SPACER may also be used for wire rope connection with the only condition that the Anchor Nail is not used as a direct anchor for the wire rope but as a SPACER device (see example below) :



This is the only mounting accepted for a safety line or critical application connection with the Anchor Nail SPACER.

CHECKING

4



4.1 General Informations

If any problem was to be detected, please contact LE CLOU-S.V.A in order to get an opinion on the appropriate corrective measures to be taken, if needed.

If an installation was presenting a risk to the user's safety, they shall be temporarily closed pending corrective maintenance operations.

4.2 Routine Visual Check (daily)

- Tree: Check that there is no space between the Anchor Nail's shoulder and the support tree (or cicatricial bulge, if any).

4.3 Operational Inspection (monthly)

The operational inspection includes all the checks required for a routine visual check. In addition, the following points shall also be checked:

- Anchor Nail:
 - Check that the the Anchor Nail does not show any deformation. Check tension for wire ropes connected to the Anchor Nails (visual check with reference for the initial condition). If any problem is detected, carry out a more detailed inspection in order to identify the origin of the overtension.
 - Check for the appearance of any alterations (cracks) or rust traces.
- Connectors:
 - Check that the connectors do not show any deformation. Perform a functional test, specifically on moving parts (swivel, articulated lifting eye,...)
 - Check for the appearance of any alterations (cracks) or rust traces. Check the tightening (if needed) as well as the general condition of the various welds or connections (if applicable).
- Tree: Check that there are no cracks in the tree fibers around the Anchor Nail.



(Note : Example picture above taken during pull-off test on anchor nail)

4.4 Contrôles annuels périodiques

To comply with the requirements of standard EN &5 567-1, it is recommended to use a type A inspection body according to ISO 17 020 ("third party" type inspection body) to carry out the annual periodical inspection.

NOTE: When a tightening is carried out with nuts, a marking on the two parts in contact makes it easy to validate that the tightening is maintained.

MAINTENANCE

5



5.1 Anchor Modification due to support tree growth

When the tree's cicatricial bulge around the Anchor Nail is such that only 4cm of the threaded part of the Anchor Nail SPACER is visible, a "ANCHOR NAIL SPACER EXTENSION" shall be added to the Anchor Nail.

This Anchor Nail Extension is composed by a threaded bar M22 attached with thread lock to a connecting ferrule (see picture below):



This ANCHOR NAIL EXTENSION shall be connected to the thread of the Anchor Nail SPACER using the connecting ferrule and thread lock.

The Anchor Nail and its EXTENSION can be used in the same conditions than before.

NOTE 1: Batch number of the Anchor Nail Spacer won't be visible anymore once the connecting ferrule is installed so this batch number shall be reported on the site maintenance logbook or the connecting ferrule.

NOTE 2: It is advisable to use EXTENSIONS supplied by LE CLOU SVA, because they have mechanical properties adapted to their use. If you want to use your own hardware, you should contact LE CLOU SVA to install hardware with equivalent properties.

Place a nut on the nail termination BEFORE installing the SAFETY LINE EXTENSION. Once assembly completed, tighten the nut to the connecting ferrule (inside).



NOTE 3: A marking between the nut and the connecting ferrule makes it easy to check that the tightening is still correct.

TESTS OF FORCES

6



6.1 Test on the Anchor Nail Spacer



From the 25th of October 2022



Axial Pull

	23/05/2022		28/09/2022		
Observations	larch tree	larch tree	Pine tree	Oak tree	Beech tree
usage limit	900 daN	1000 daN	700 daN	900 daN	1500 daN
Uprooting	YES	YES	YES	YES	YES
rupture	2880 daN	3216 daN	2266 daN	2866 daN	4600 daN

Only the "lowest reference values" are to be taken into account.

The values designated "As an indication" are to be taken for information only and cannot be taken as a reference.

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