





# Application: Electric – Motors

# RF attenuation from DC up to 100 MHz

# Inductive Absorbers to eliminate high frequency noise from your installation

# Problem with Servo Motors - Part 1:

The main Bearings are normally not damaged by Electroerosion´.

The Sensor Bearings (Servo Motors) are easily damaged by high frequency Currents running over it.

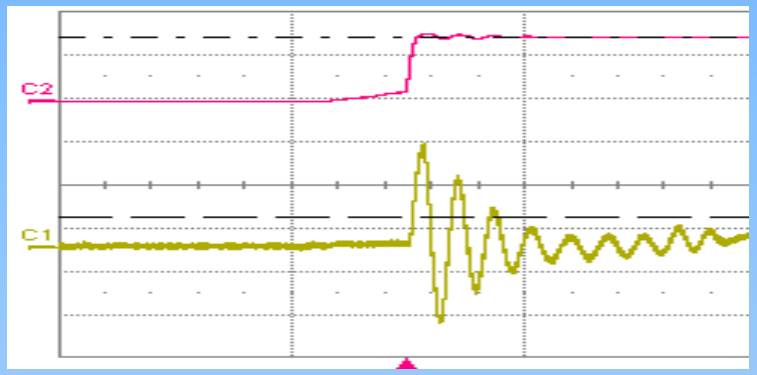
Target is to reduce the high frequency peak Current under 10 A.

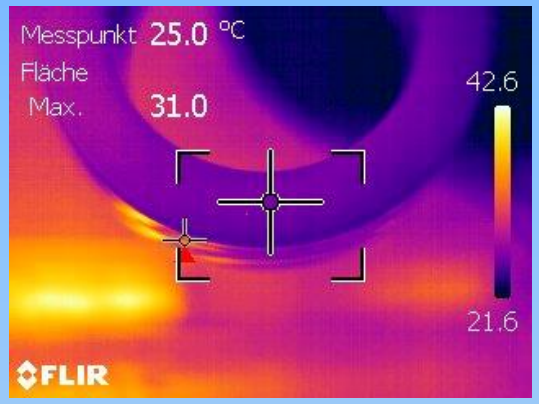
Without having a too high temperature (below 60 °C) at the cores and the cost should be in an acceptable range.

Easy mounting and no maintenace is required.

# Servo – Motors are special: Absorption of HF-noise

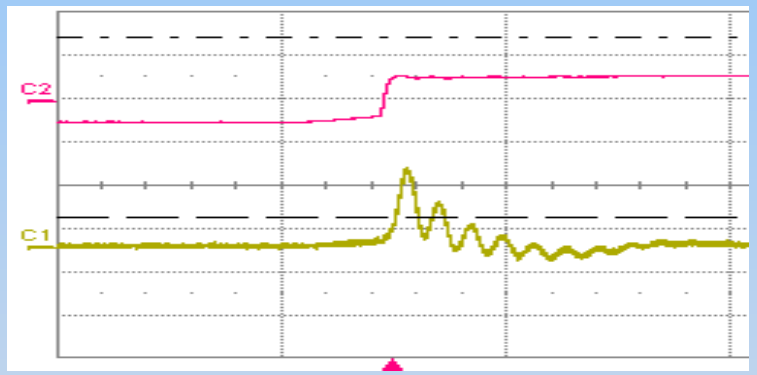
Initial situation: nealy 40 A Ipeak Common Mode Currents

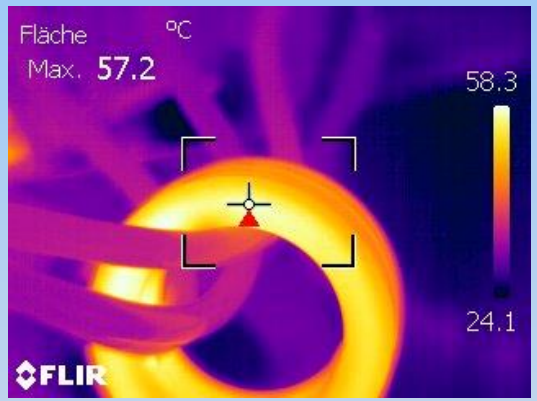



Cores deacitvated

Improvement: lower than 15A Ipeak Common Mode Currents




Cores acitvated





# Problem with Servo Motors - Part 2:

How to get more absorption without getting too hot ?

1. Use the suitable common mode COOL BLUE® cores by selecting

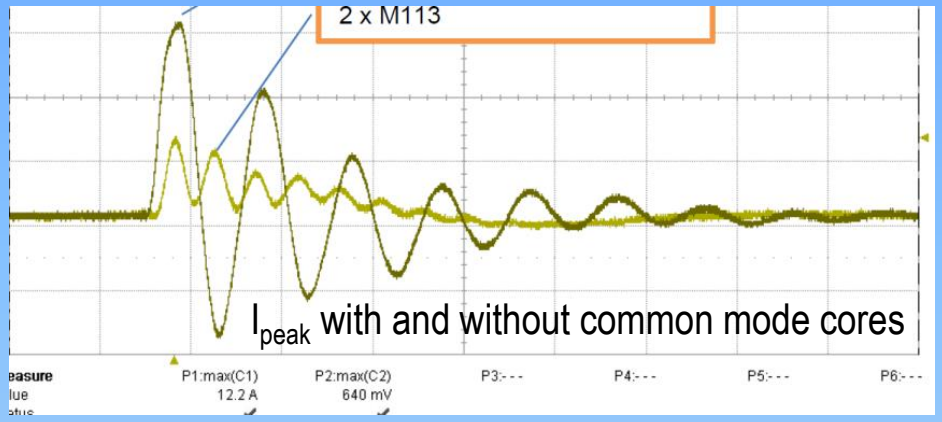
the mechanical shape (inner hole has to be big enough) and

the maximum peak current (Common Mode)

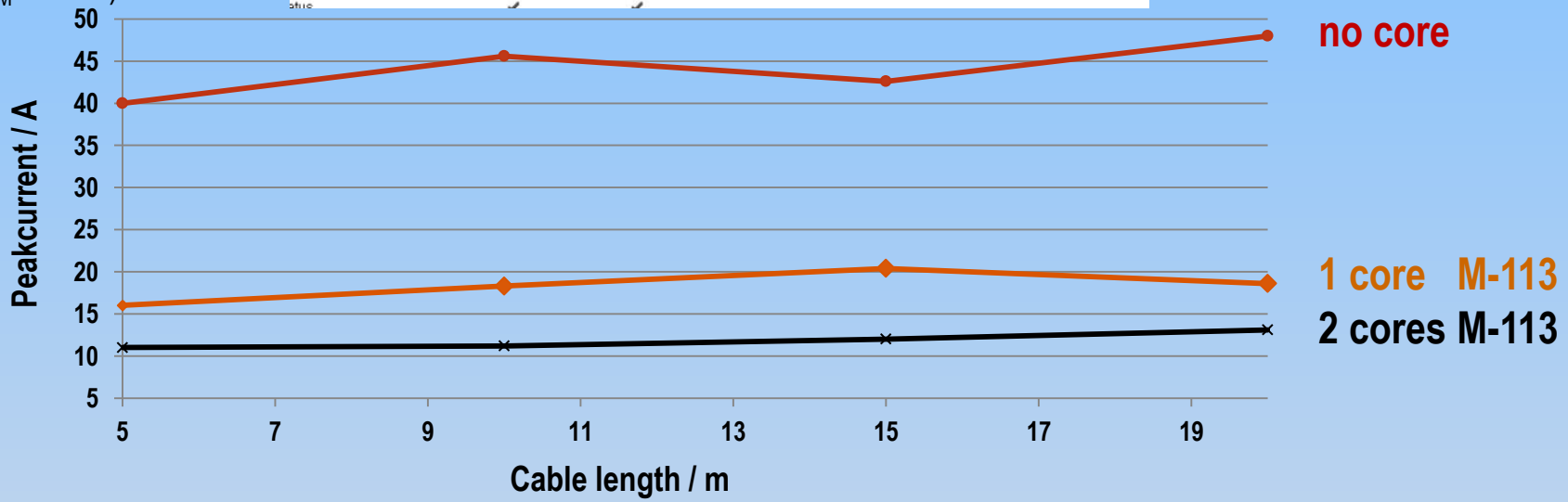
or look at the application table for different Power and Motor cable lengths

2. Add NANOPERM ® Line Absorbers (NaLA® High Permeability ~ 80.000)

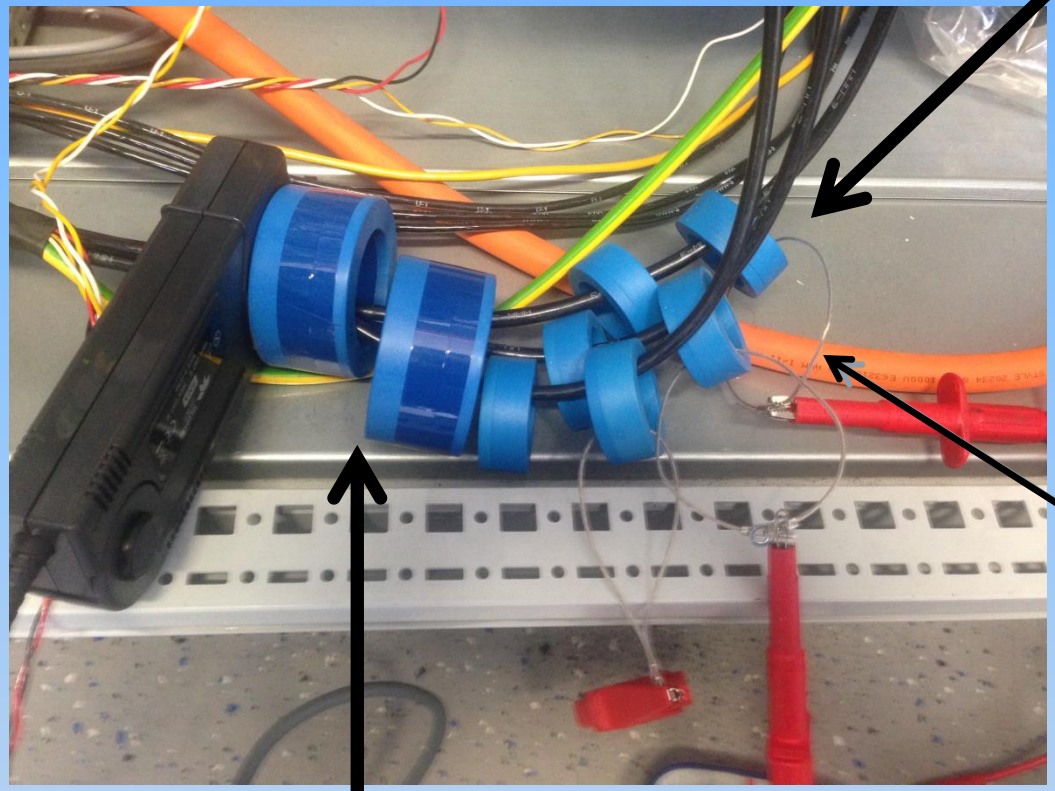
# 1. step: introducing COOL BLUE® Cores




**AC-drive**
($f_{PWM}$ = 5kHz)



# 2. step: adding NANOPERM® Line Aborbers NaLA® type M-381



option for effect demonstration :
deactivate cores by a shortcut

2 x M-113

MAGNETEC®
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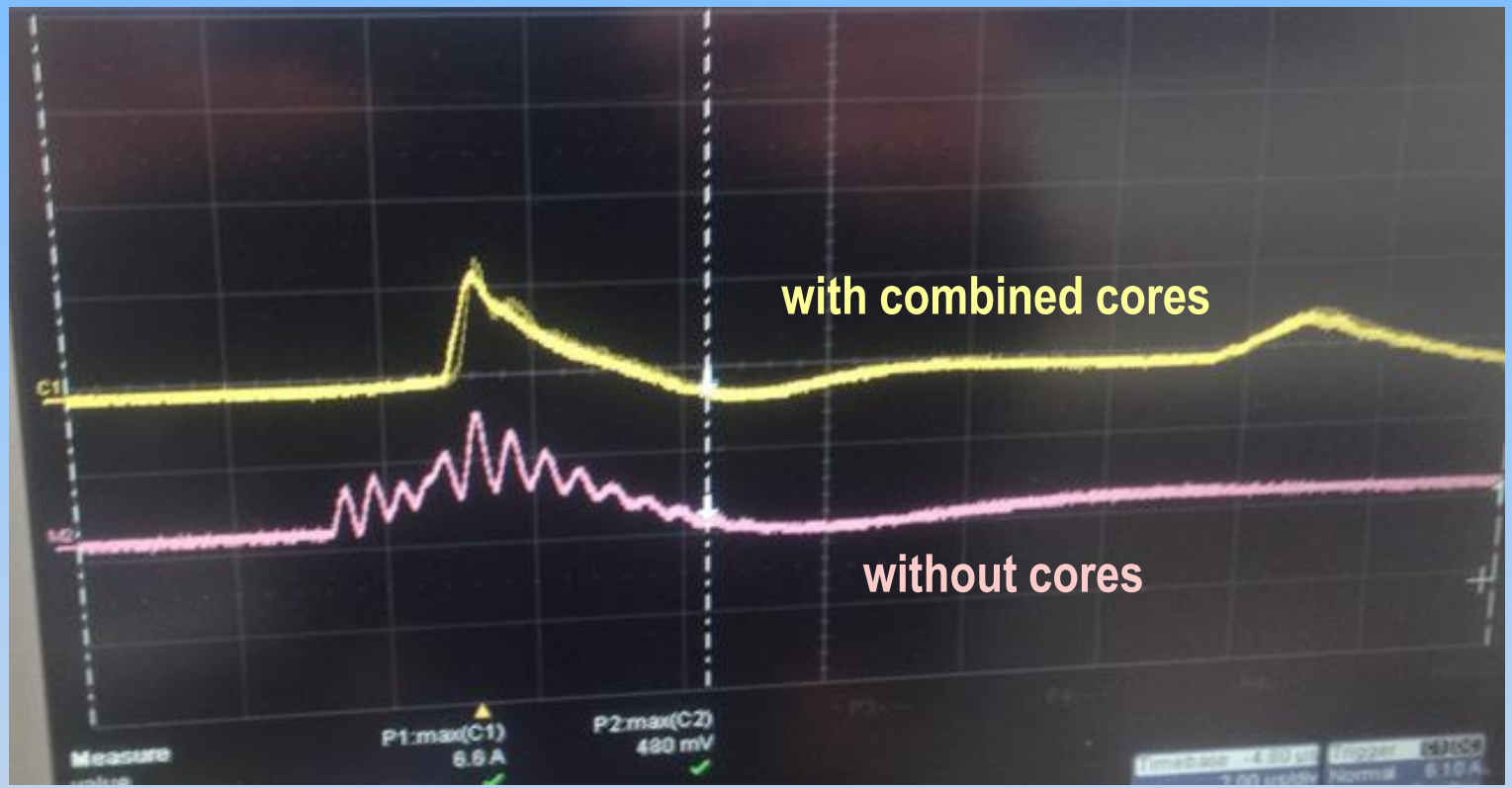
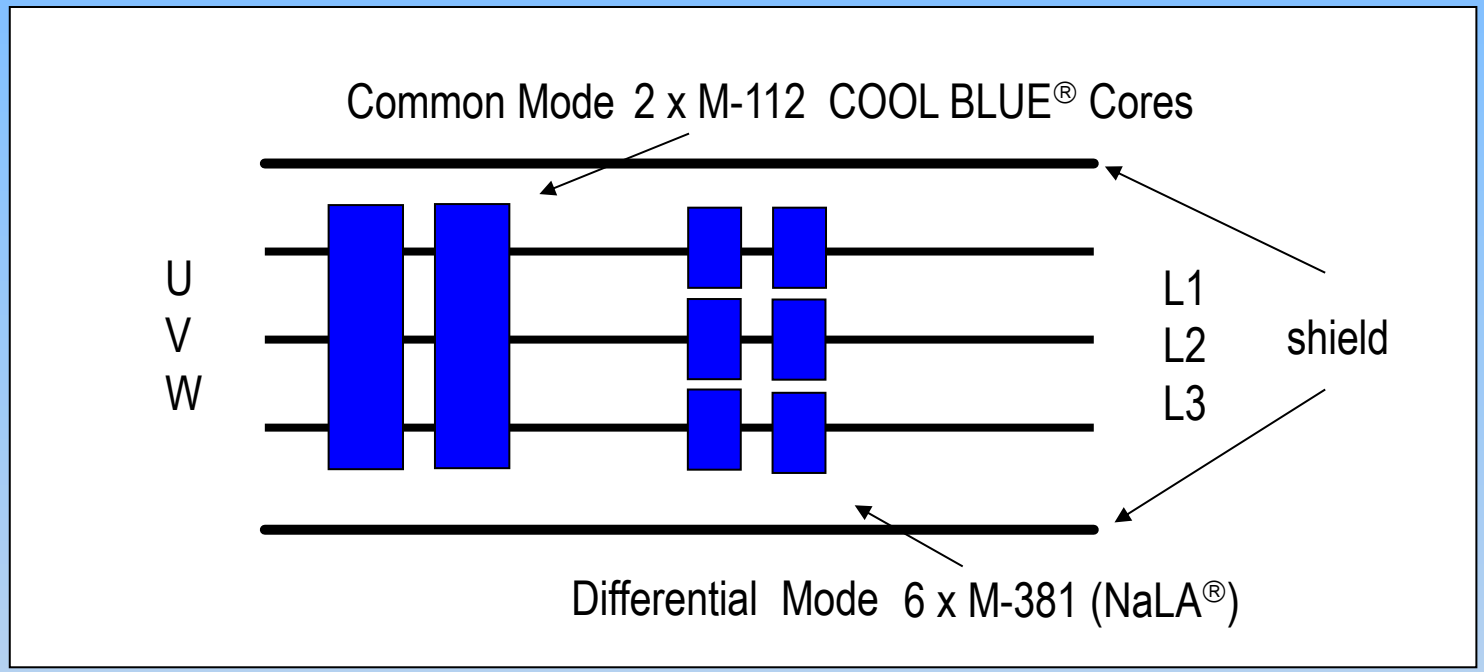
# Reducing $I_{peak}$ from ~ 40 A down to ~ 6 A by combination of COOL BLUE® Cores and NANOPERM® Line Absorbers NaLA® and smoothening the High Frequency away



# Solution: Combine the COOL BLUE® Cores and NaLA® cores to absorb the Common Mode Noise to save thermal Energy



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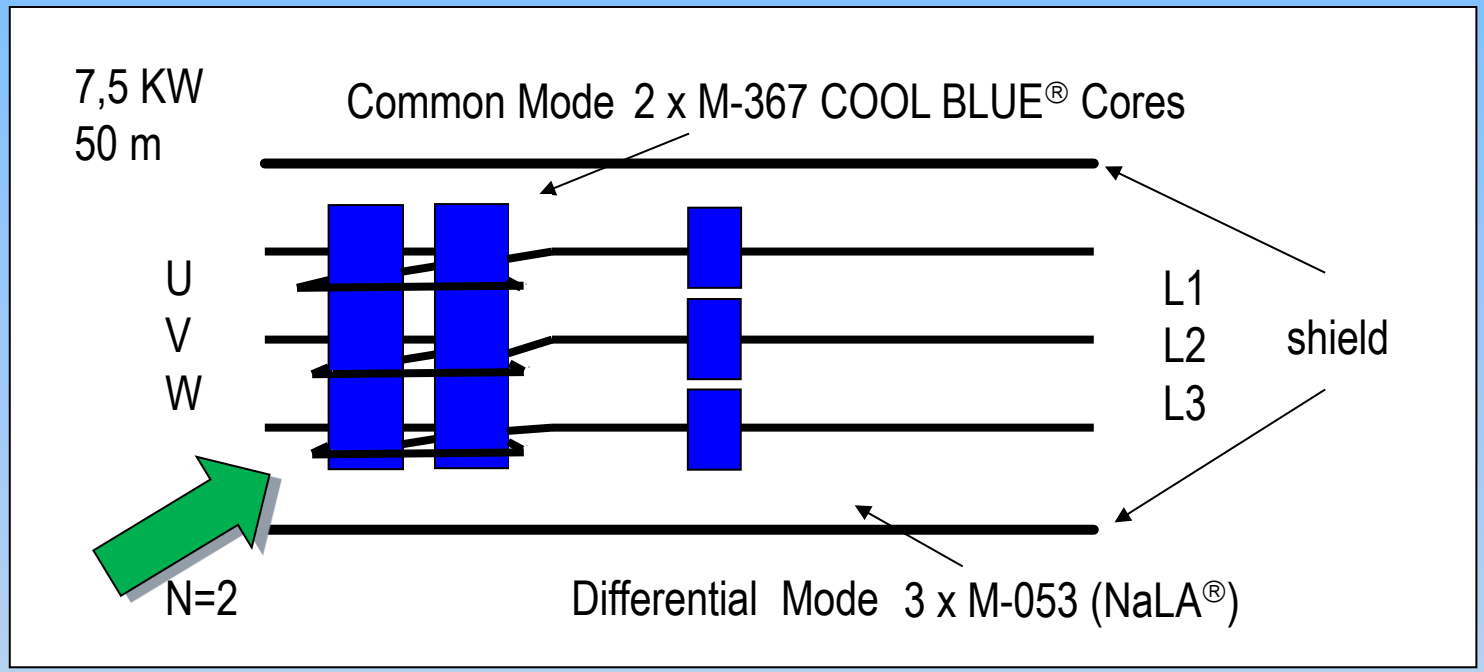





# 1. Common Mode Noise suppression for Inverter drives with NANOPERM® Cores

**Table: selection and amount of Cool Blue Cores depending on rated power and cable length**

Hans-Joachim Poess

All data are for information and not guaranteed values.

| | Inverter power range up to | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Kilowatt | 0,7 | 7,5 | 30 | 75 | 315 | 1.200 | > 1.200 |
| | horse power | 1 | 10 | 40 | 102 | 428 | 1.631 | > 1.631 |
| | **p/n oval** | **n/a** | **M-049** | **M-049** | **M-283** | **M-302** | **M-111** | **M-248** |
| | **p/n round** | **M-923** | **M-367** | **M-367** | **M-113** | **M-116** | **M-117** | **n /a** |
| **Cable length [m]** | 50/164 ft | 2 | 2 | 4 | 4 | 4 | 4 | 4 |
| | 100/328 ft | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 150/492 ft | 4 | 4 | 6 | 6 | 6 | 6 | 6 |
| | 300/984 ft | 4 | 4 | 6 | 6 | 6 | 6 | 6 |
| | | | | | | | | **Amount of cores [pcs.]** |

N=2 N=1

Low power range (up to 10 kw) need some times 2 turns on the Nanoperm cores

# 2. Differential Mode Noise suppression for Inverter drives with NANOPERM® Line Absorbers NaLA®

Table : selection and amount of NaLA Cores depending on rated power and cable length

Hans-Joachim Poess

All data are for information and not guaranteed values.

| | Inverter power range up to | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Kilowatt | 0,7 | 7,5 | 30 | 75 | 315 | 1.200 | > 1.200 |
| | horse power | 1 | 10 | 40 | 102 | 428 | 1631 | > 1.200 |
| | **p/n** | **M-606** | **M-053** | **M-102** | **M-381** | **M-613** | **M-614** | **M-616** |
| | **core size $D_a$ $D_i$ h [mm]** | **16x11x5** | **25x20x10** | **30x20x10** | **40x32x15** | **80x63x30** | **100x80x30** | **160x130x30** |
| **Cable length [m]** | 50/164 ft | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 100/328 ft | 4 | 2 | 2 | 2 | 2 | 2 | 2 |
| | 150/492 ft | 6 | 3 | 3 | 3 | 3 | 3 | 3 |
| | 300/984 ft | 8 | 4 | 4 | 4 | 4 | 4 | 4 |

**Amount of cores [pcs.]**

If the NaLA cores getting too warm, use the double amount each line