



# ***BundleTutor***

*Transporter for heat exchanger  
tube bundles*



MADE IN ITALY



# BundleTutor lifter

For easy, safe and secure **aerial**  
handling of the tube bundle

MAUS ITALIA presents the **BundleTutor lifter** for the **aerial handling of tube bundles**, for use both **within the plant and during the production of heat exchangers**. By lifting the tube bundle easily and safely, the **BundleTutor lifter** eliminates the risk of destroying the baffles and damaging the tubes.

The MAUS ITALIA team is available to design custom solutions for extreme circumstances and ATEX / NAVY versions for the offshore market.

For **independent handling** using the **BundleTutor mobil**, please refer to page

BT-18

For onshore/offshore  
maintenance

For production



Testing of a special **offshore** version in combined use with the **MefexpressHT** tube bundle extractor

# Focus - features

## STANDARD



NO damage

### Protects the tube bundle

The **BundleTutor lifter** sustain and supports the tube bundle during handling using two complementary and independent feature (clamps and lifting slings), ensuring perfect support along its longitudinal axis and eliminating tensions and deformations.



Easy to use

### Easy

The **BundleTutor lifter** is an extremely easy machine to use.

A small number of intuitive controls allow the easy handling of the heavy tonnage of a tube bundle.



Wrapping

### Encircling

The symmetrical clamps of the **BundleTutor lifter** and independent hydraulically controlled by the operator, can be easily adapted to the dimensions of the tube bundle to be lifted by encircling it carefully along its entire length



Wireless

### Freedom of movement

All movement and adjustment controls can be managed by remote control on request.



## OPTIONAL



Customized

### ATEX certification

The **BundleTutor lifter** can be manufactured on request according to the ATEX directive in an explosion proof configuration for use in environments with a potentially explosive atmosphere.



ATEX

### DNV certification for FPSO and offshore platforms

MAUS ITALIA can manufacture, on request, the offshore **BundleTutor lifter NAVY** version for the aerial handling of tube bundles on FPSO and platforms  
**DNV ST-0378, ST-E273-MARITIME** approved



Off shore

### Not afraid of the cold

The **BundleTutor lifter** can be supplied, on request, in the special version suitable for operating at the very lowest of temperatures.



Low Temp

### Adapts according to need

MAUS ITALIA can design, on request and after technical verification, the **BundleTutor lifter** for bundle measurements and weights that differ from the standard product.

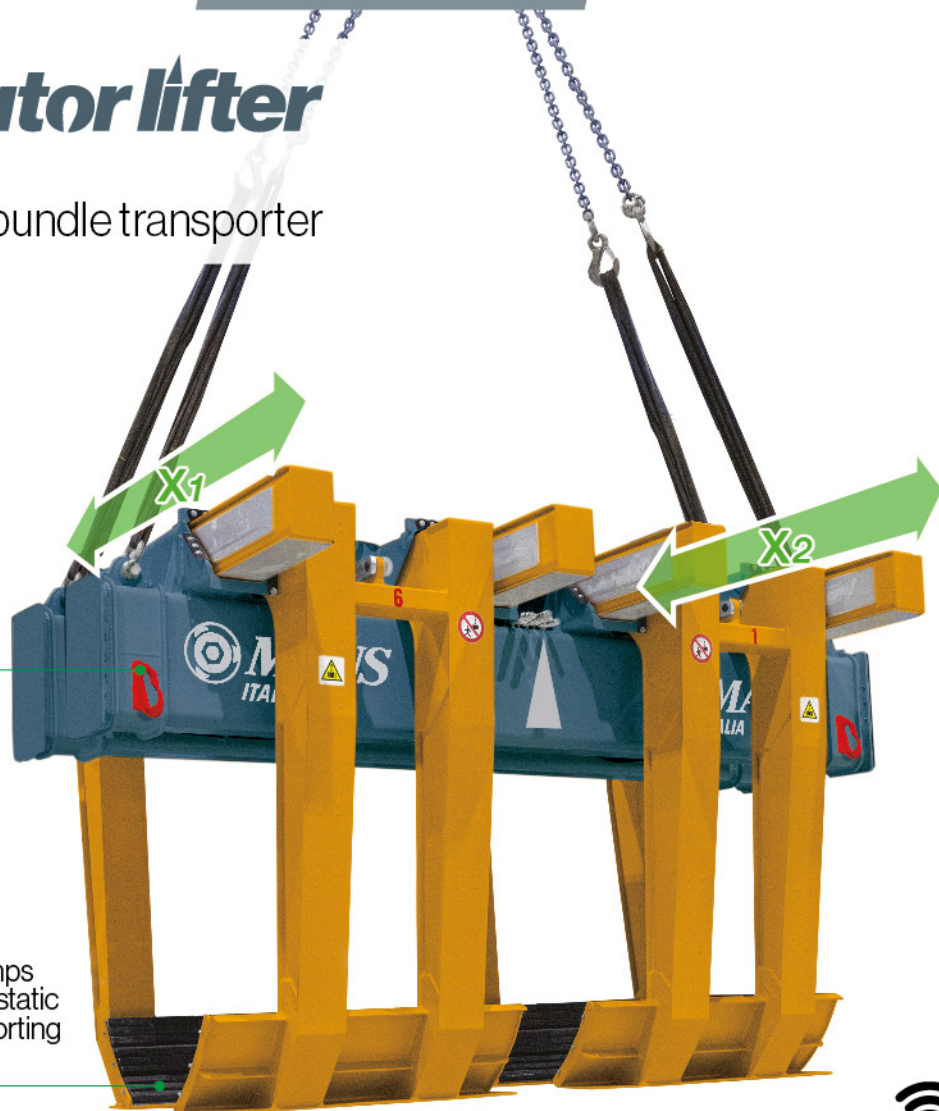


# BundleTutor lifter

## Aerial tube bundle transporter

ASH welded hooks  
for hooks  
or slings

Independent  
symmetrical clamps  
covered with antistatic  
material for supporting  
the bundle



Wrapping

### Encircling

The independent symmetrical clamps, hydraulically controlled by the operator, can be easily adapted to the dimensions of the tube bundle to be lifted by encircling it along its entire length.

### X1X2

Symmetrical opening and closing of the clamps with respect to the axis of the tube bundle to guarantee secure support and perfect centring:

Transverse opening  
**X +600 mm (23.6")** per side.



Hooking

### Coupling

In the **BundleTutor lifter**, the fixed coupling points are a simple and effective solution for fastening the tube bundle supporting slings.

The use of a manual ratchet on the harness allows the easy securing of the tube bundle already supported by the clamps.





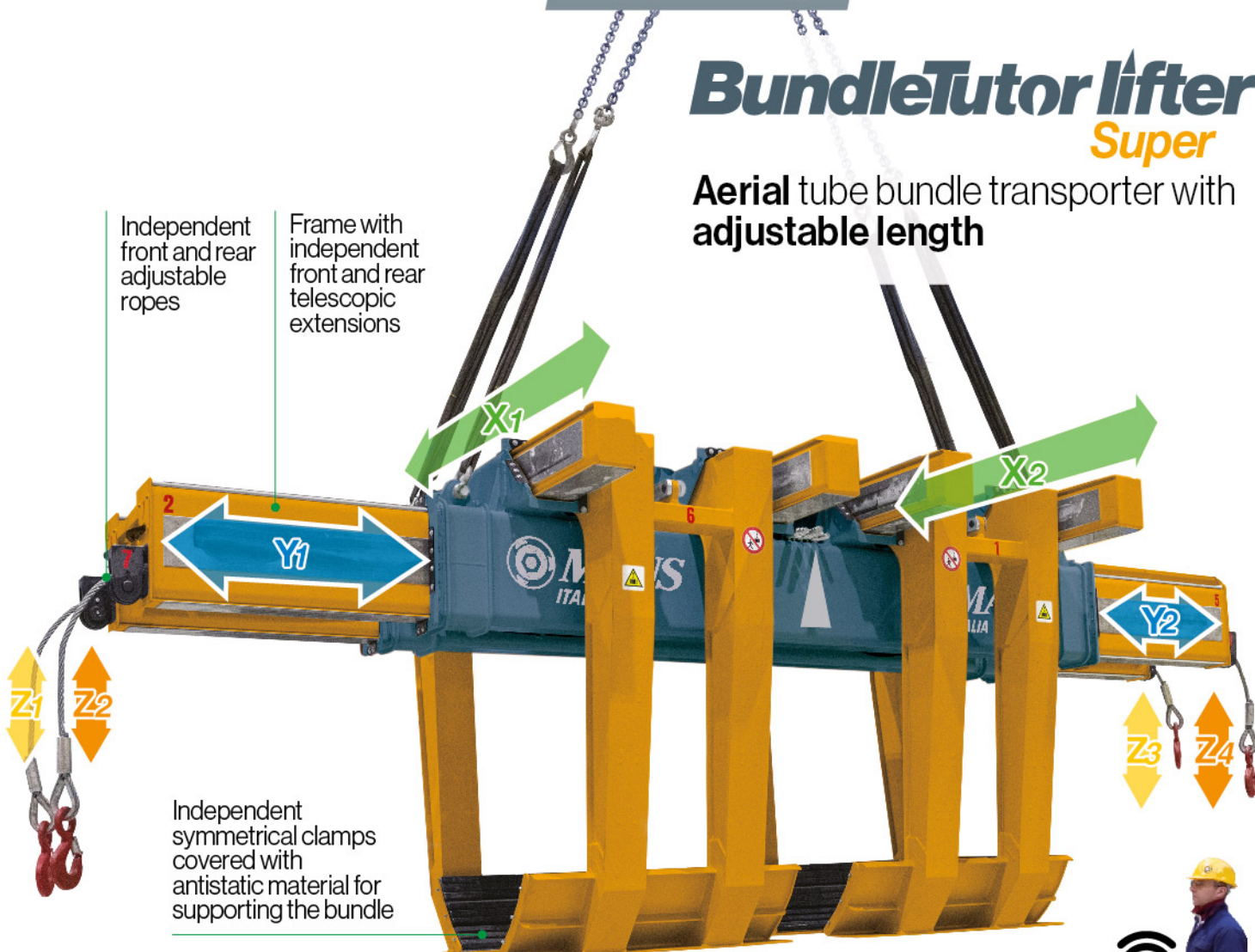
# BundleTutor lifter Super

**Aerial** tube bundle transporter with  
**adjustable length**

Independent  
front and rear  
adjustable  
ropes

Frame with  
independent  
front and rear  
telescopic  
extensions

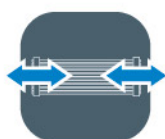
Independent  
symmetrical  
clamps  
covered with  
antistatic material for  
supporting the bundle



Wrapping

## Encircling

The independent symmetrical clamps, hydraulically controlled by the operator, can be easily adapted to the dimensions of the tube bundle to be lifted by carefully encircling it along its entire length



Telescopic

## Telescopic

Hydraulically controlled by the operator, the telescopic extensions extend the length of the most bulky of tube bundles, always ensuring perfect balance and support of the tube sheets.



Independent

## Compensates for errors

The control on the independent ropes, as well as improving the aligned support of the tube bundle, allows compensation (through rotation) for any potential positioning errors during setting down on the extractor.



## X1 X2

**Symmetrical opening and closing** of the clamps with respect to the tube bundle axis **to guarantee secure support and perfect centring**:

Transverse opening  
**X +600mm (23.6")** per side.

## Y1 Y2

**Independent telescopic extensions** of the longitudinal slings **for protection of long tube bundles** where the weight of the overhanging parts would deform the tubes:

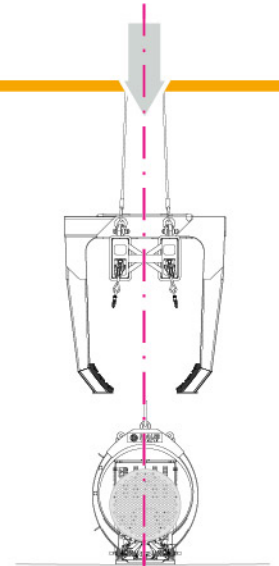
Longitudinal extension  
**Y +1000mm (39.4")** front and rear.

## Z1 Z2 Z3 Z4

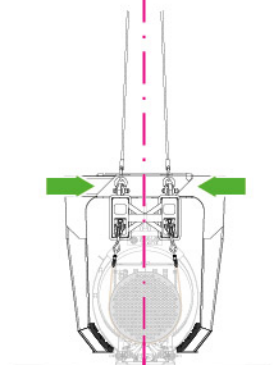
**Independent strokes** of the support ropes of the slings placed under the tube bundle **facilitate precise alignment** during subsequent insertion in the shell:

Vertical stroke  
**Z +700mm (39.4")** front and rear.

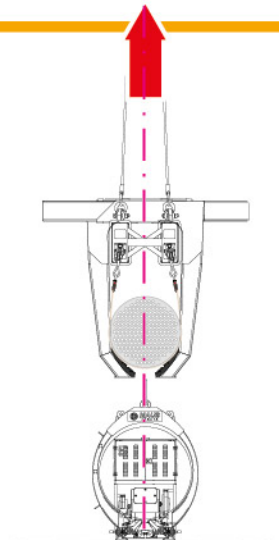
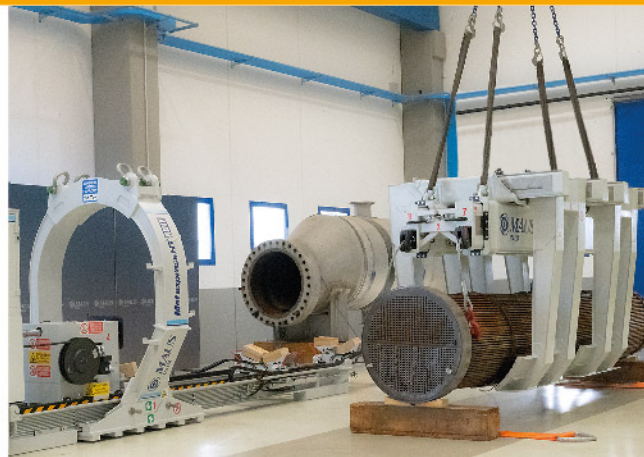
**1** Alignment with  
extractor and  
approaching



**2** Tube bundle  
sling and  
balancing



**3** Lifting and  
handling of the  
tube bundle



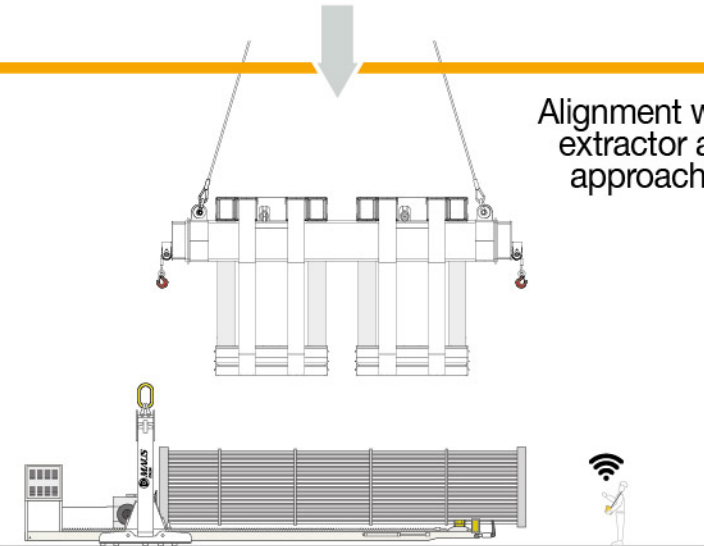


# BundleTutor lifter Super

Combined use with  
**Mef express HT** tube  
bundle extractor

Alignment with  
extractor and  
approaching

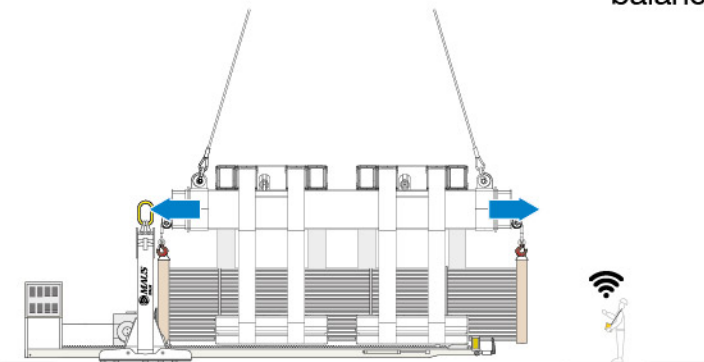
**1** The **BundleTutor lifter Super** is aligned (using a crane or bridge crane) and surmounts the **Mef express HT** which carries the tube bundle to be moved;



Tube bundle  
sliding and  
balancing

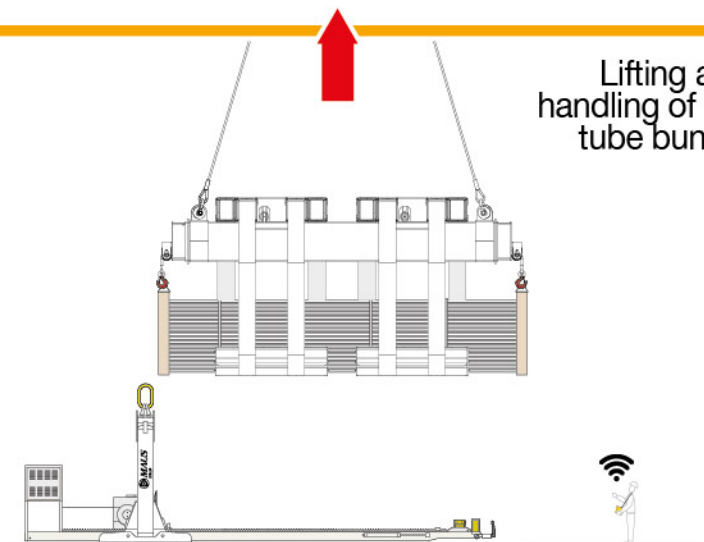
**2** after having adapted to the dimensions of the tube bundle, the **BundleTutor lifter Super** harnesses it and, extremely carefully, lifts it using the support slings controlled by independent ropes, balancing it upon the longitudinal axis;

*The clamps, working symmetrically, centre and encompass the bundle, ensuring its support.*



Lifting and  
handling of the  
tube bundle

**3** the tube bundle is thus easily lifted, moved and set down in complete safety for scheduled maintenance.

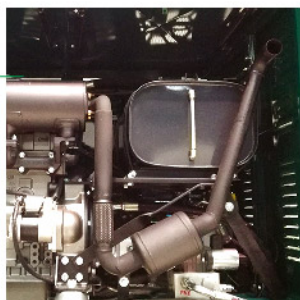


# BundleTutor lifter

## Standard features of our aerial tube bundle transporters

### Catalytic flame arrestor with vibration damping

Fire and explosion protection  
device to limit combustion by  
extinguishing flames.



### Remote control

Allows the operator to control all  
commands at a safe distance  
from the handling area without the  
often clutter connecting cable  
(anyway supplied: 10m - 32.8ft).



### Remote control with connection cable

A practical remote control  
allows the operator to control  
all the commands, while  
remaining at a safe distance  
from the handling area

### Air-cooled diesel engine

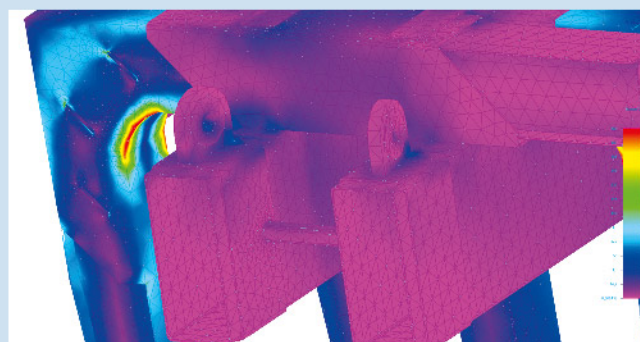
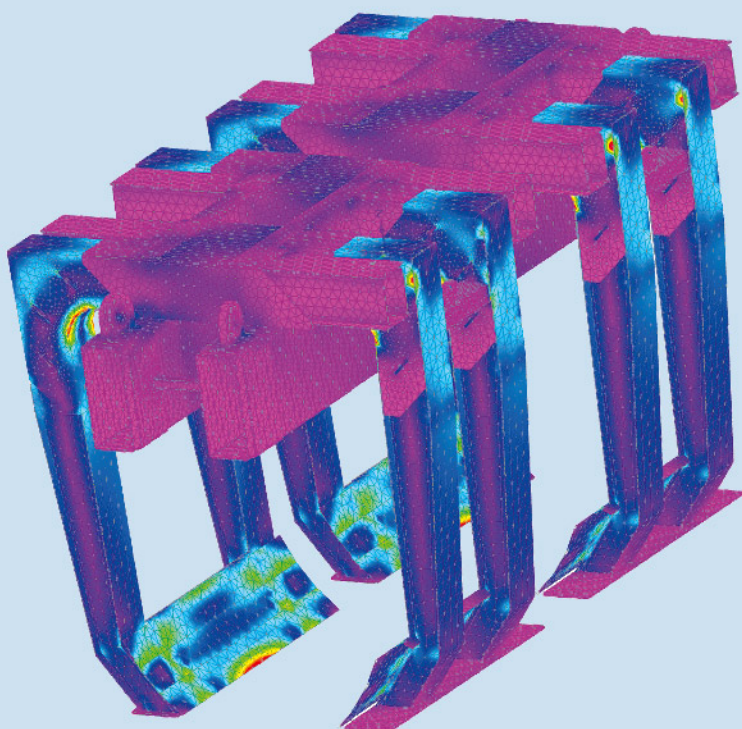
The standard motorisation  
offered by MAUS ITALIA  
consists of an air-cooled  
diesel engine



## Structural analysis

During the 3D design phase, each **BundleTutor lifter**  
is subjected to structural analysis using the Finite  
Element Method.

*Predicting what will happen when the product is used  
allows for optimised and free design.*





# BundleTutor lifter

## Optional features of our aerial tube bundle transporters

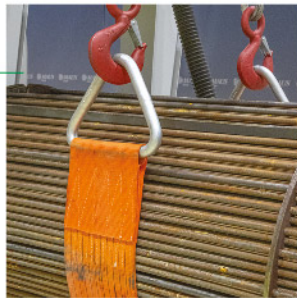
### Plug-in electric motor

For operation in closed spaces while respecting the environment and operator health, MAUS ITALIA offer a fully electric version



### Lifting slings

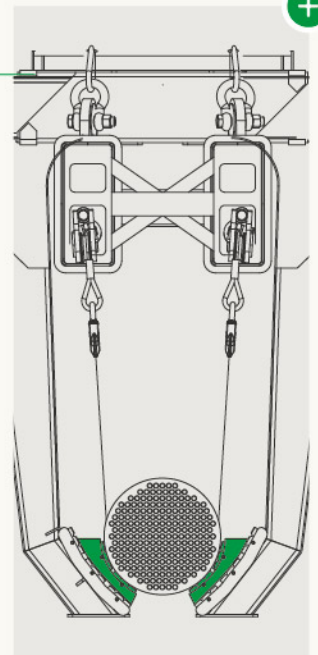
MAUS ITALIA supplies double-layer polyester slings with a hooking system according to the **BundleTutor lifter Super** model and the size of the tube bundle to be handled



### Reducers for clamps

To improve grip on very small tube bundles, MAUS ITALIA offers a reducer assembly coated with nitrile rubber (NBR 65) for the standard clamps.

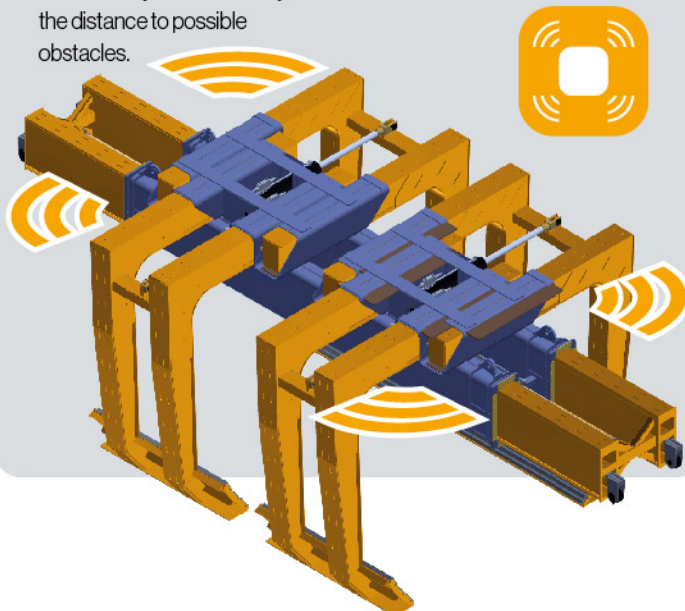
For particular size reductions, MAUS ITALIA technical staff are available to suggest the most suitable solution and then design, build and supply the necessary components



### Ultrasonic sensors

The **BundleTutor lifter** can be equipped with 4 ultrasonic sensors to reliably detect, continuously and accurately, the distance to possible obstacles.

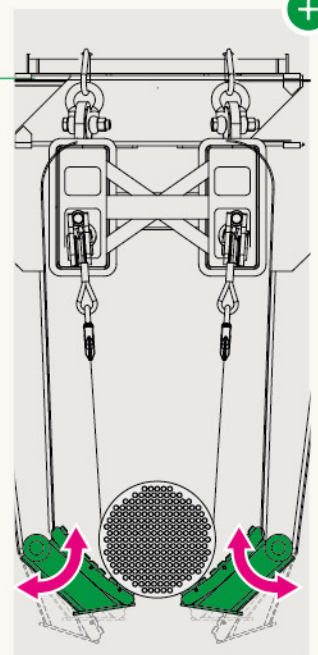
A visual signal helps the operator at the crane or overhead crane during handling



### Articulated clamps

Hydraulically assisted joints are the most efficient solution to guarantee an ergonomic grip.

Additional hydraulic controls act on the joints of the clamps, adapting them to the shape of the tube bundle to be lifted





## **BundleTutor lifter** **ATEX** **Ex**

### Armoured power circuits

Power circuits are insulated in explosion proof containers to prevent any sparks entering the work environment



### Combustion gas cooling

Insertion of a heat exchanger and a vibration damper allows the rapid cooling of exhaust gases up to the values allowed by thermal class T.



## **BundleTutor lifter** **CSA**

For the North American market (Canada and USA), MAUS ITALIA designs, manufactures and certifies tube bundle transporters according to the CSA reference standards.

### Armoured engine components

Components such as the alternator, the starter motor and the battery are insulated in explosion proof containers to prevent any sparks from entering the work environment



## **BundleTutor lifter** **NAVY**

**BTL22**

**BTL22S**



**DNV**  
ST-0378 | ST-E273  
MARITIME



Off shore

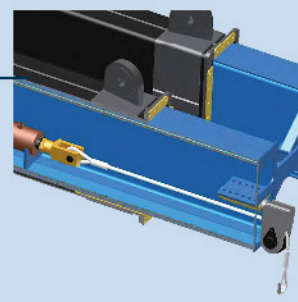
### Lifting certification

The supplied chains, shackles and lifting hooks are **DNV** certified for use on platforms and in cases of extreme stress.



### Movement certification

Movement components, such as hydraulic cylinders, are **DNV** certified for use on platforms and in cases of extreme stress.







# BundleTutor lifter

## Certified construction of aerial tube bundle transporter

MAUS ITALIA, on customer request, can manufacture **BundleTutor lifter** in an explosion proof version, certified to operate in environments with potentially explosive atmospheres (**ATEX**) and on platforms/FPSO (**DNV - MARITIME**).

### Overdrive control

A vacuum cutoff valve installed on the engine intake prevents the engine from overheating due to overdrive



### Non-sparking stainless steel protections

Each sliding part is coated with stainless steel which also protects it from the accumulation of grease, thus avoiding any related maintenance



The construction of an **ATEX**-certified transporter is achieved by increasing **thermal and electrical safety** with components designed to avoid in any way the ignition of gas which may be present in the working atmosphere.



The surface temperature of each component and of the exhaust gases must remain below the threshold defined by reference class **T**.



Any potential causes of sparks must be eliminated: from electrostatic charges to insulation in armoured containers of each power circuit.

Some of the solutions adopted for the construction of an **ATEX** handler are shown on this page.



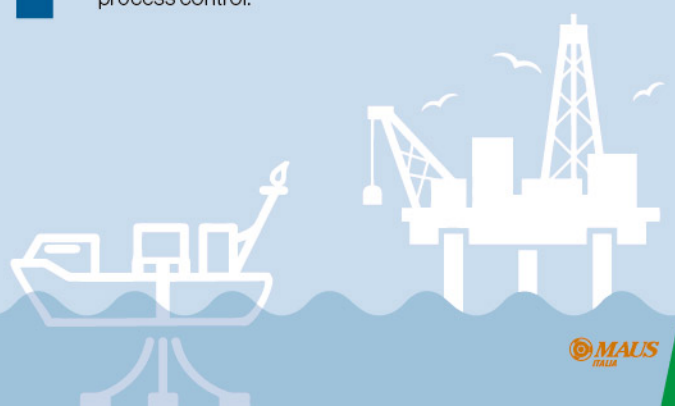
### Weld certification

Welds are subjected to magnetoscopic (or radiographic) examination to obtain **DNV** certification



MAUS ITALIA can manufacture, on customer request, offshore **BundleTutor lifter** handlers.

The **DNV MARITIME certified transformation** includes **everything which has already been done to obtain ATEX certification** with additional specifications for lifting accessories, movement and sizing guided by certification with more accurate process control.



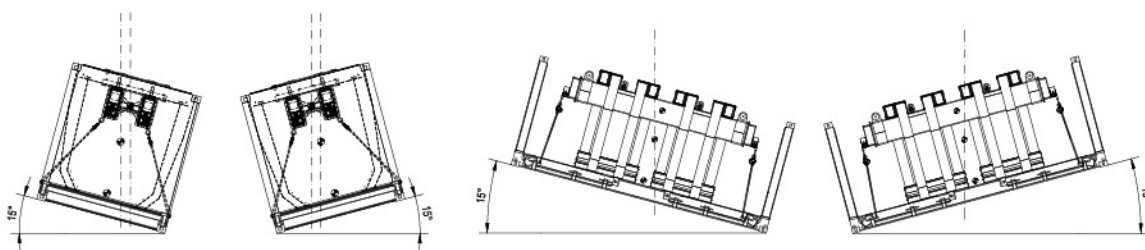
# BundleTutor lifter **NAVY**

*For operation in the open sea where extreme conditions and erosion are merciless*

MAUS ITALIA patents and certifies the **BundleTutor lifter**, with **DNV•GL** approval, in a special **NAVY** version, which it offers **for the aerial handling of tube bundles on offshore platforms and FPSO.**

Il **BundleTutor lifter NAVY** concentrates anti-spark materials of the highest level suitable to withstand extreme situations and for operation in potentially explosive environments (**ATEX**) where every possible source of ignition must be eliminated.

In addition to **tests simulating offshore conditions**, each component and the assembled machine have been subjected to the approval of the **responsible certifier.**



**NEW  
PATENTED**

**ATEX**

**DNV•GL**  
ST-0378 | ST-E273  
MARITIME

## Extremely offshore

Equipment certified for operation in hazardous areas ATEX Zone 2, IIA/B,T3



# BundleTutor lifter

*For operation in closed spaces while respecting the environment and operator health*

MAUS ITALIA offers a **fully electric version** of the **BundleTutor lifter**, especially for **workshops and closed spaces where the use of a combustion engine causes an unhealthy environment**.

The **BundleTutor lifter ** is offered as a **green** solution with **zero emissions** and with **autonomy of over 25 working cycles**.

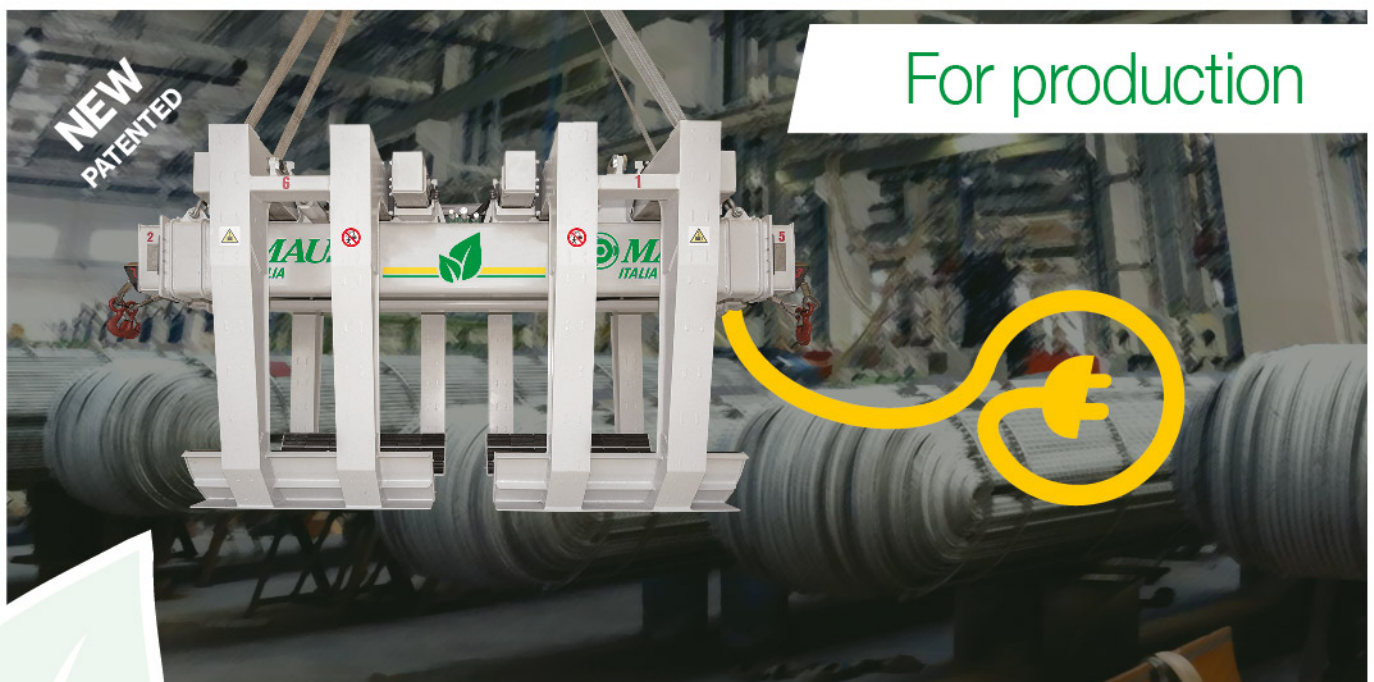


Plug-in

7h of charging for 25  
working cycles in full autonomy



Healthy  
environment




The reference diameter for gripping the tube bundles is that of the diaphragms, significantly lower than that of the relative tube sheet

# BundleTutor lifter




**BTL22**

<b>BundleTutor lifter</b>			<b>BTL30</b>	
Lifting capacity (max.)	 T	lb	<b>30</b>	<b>66000</b>
Ø bundle baffles (min.)	d	mm inches	600	23.6
Ø bundle baffles (max.)	D	mm inches	1800	70.9
Length	A	mm ft	4100	13.5
Width	B	mm ft	3040	9.8
Width (closed)	Bc	mm ft	2060	6.8
Height	C	mm ft	2300	7.6
Weight	T	lb	5,2	11470

# BundleTutor lifter Super



<b>BundleTutor lifter Super</b>			<b>BTL30S</b>	
Lifting capacity (max.)	 T	lb	<b>30</b>	<b>66000</b>
Ø bundle baffles (min.)	d	mm inches	600	23.6
Ø bundle baffles (max.)	D	mm inches	1800	70.9
Length	A	ft	6580	21.6
Length(closed)	Ac	mm ft	4580	15.0
Width	B	ft	3040	9.8
Width (closed)	Bc	mm ft	2060	6.8
Height	C	ft	2300	7.6
Weight	T	lb	6,5	14330



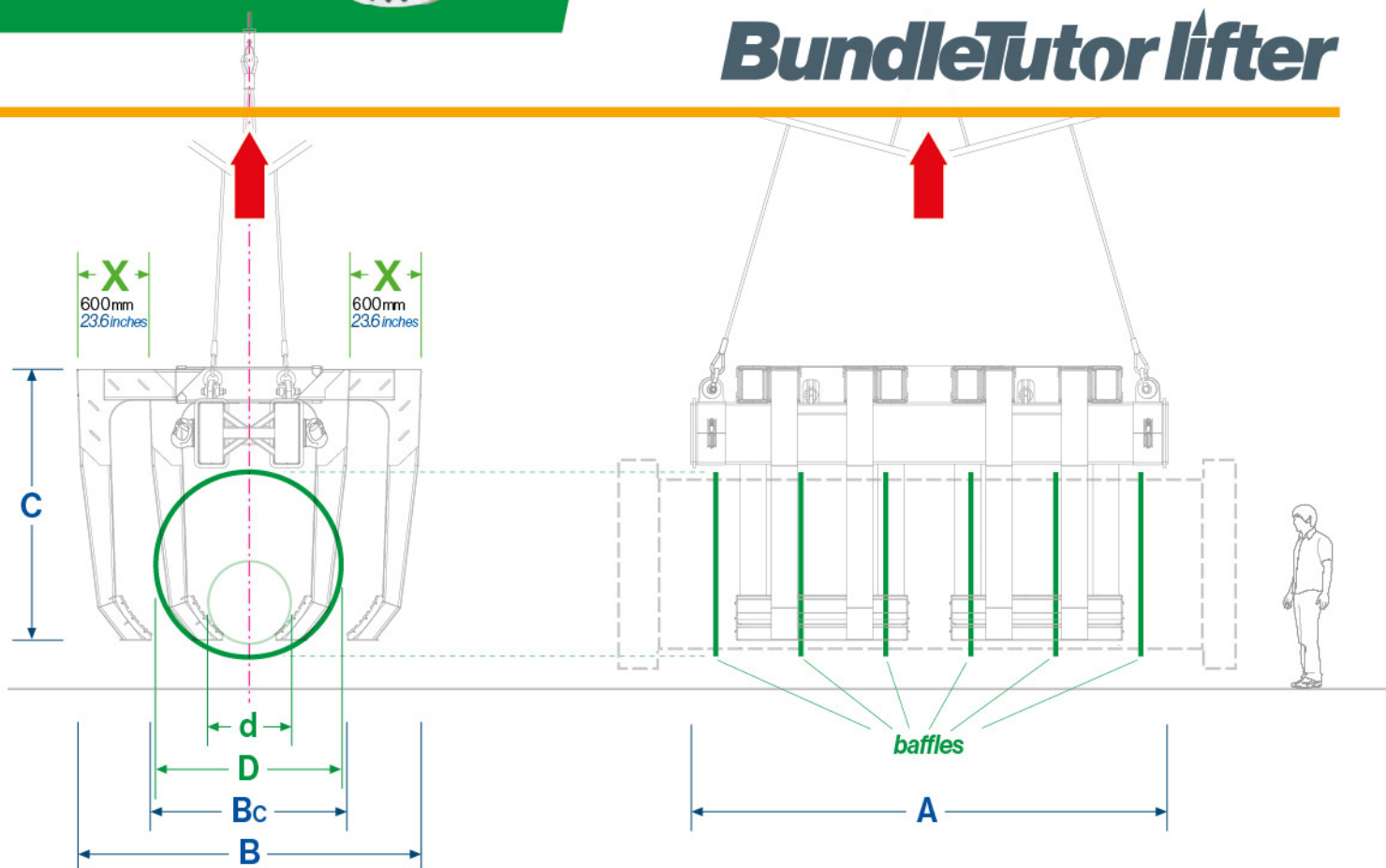
Customized

MAUS ITALIA can design, on request and after technical verification, the **BundleTutor lifter** with **Diesel** or **electric** motorisation for **bundle measurements and weights that differ** from the standard product.

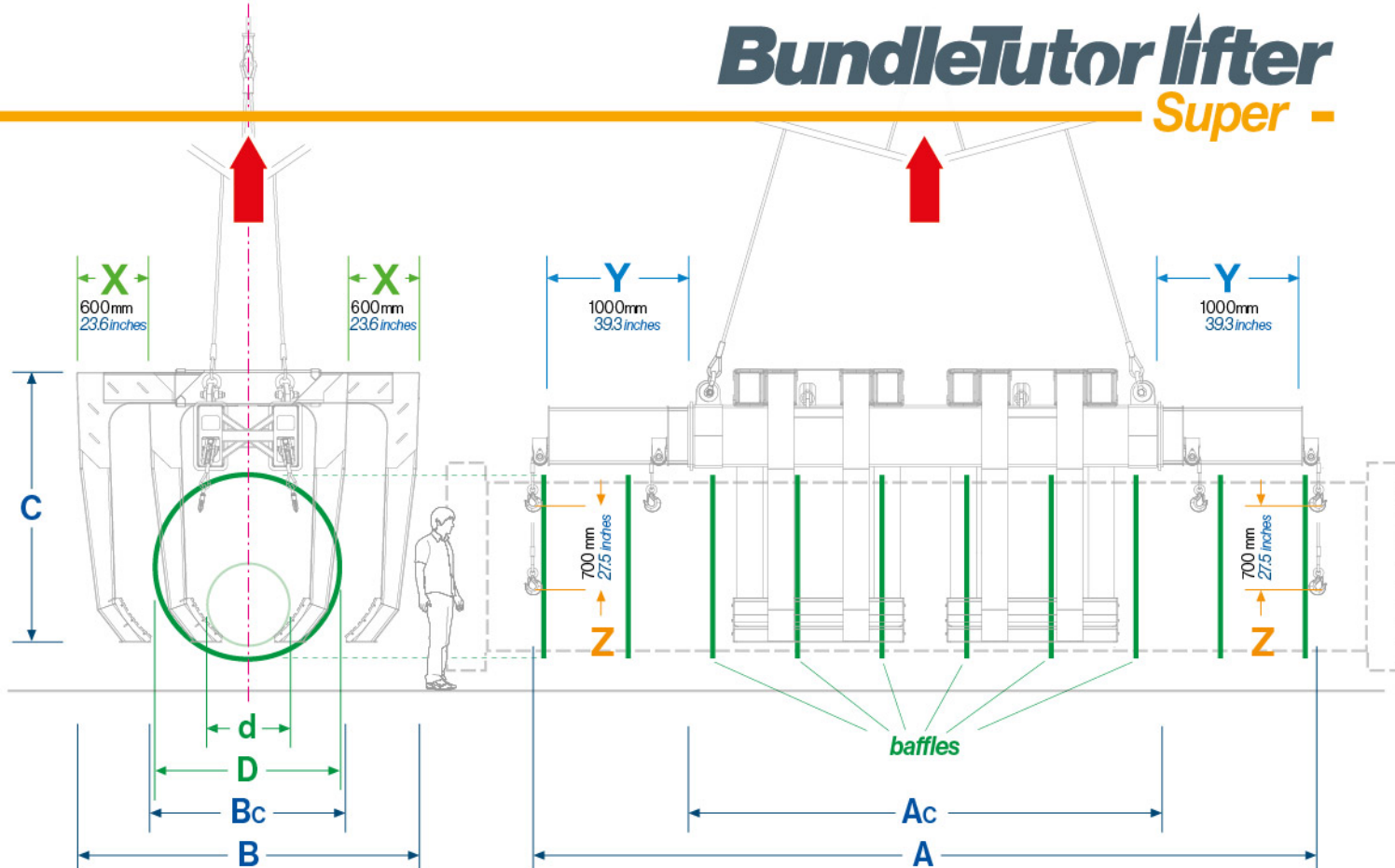





## BundleTutor lifter



## BundleTutor lifter Super







*Have you got  
a tube bundle  
handling problem?*



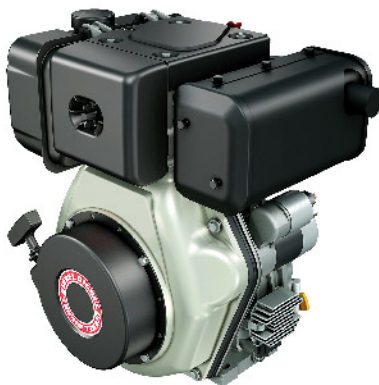


# BundleTutor lifter

## Motorisation of aerial tube bundle transporters

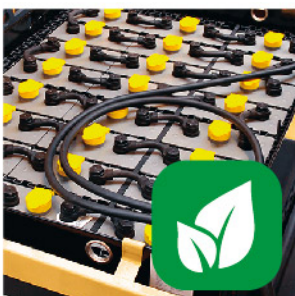
MAUS ITALIA offers the engines listed below for its diesel and electric versions.

Different engines are available upon request to meet the requirements of the country where the **BundleTutor lifter** will operate or for particular required emissions certificates.



Motorisation			BundleTutor lifter D	
Model			YANMAR L100V6	*
Type			4 stroke - air cooled	
Suction			Natural	
Combustion system			Direct Injection	
Cylinders			1	
Displacement	l	inches <sup>3</sup>	0,435	26,5
Nominal power (@ 3600 rpm)	kW	HP	6,8	9,1
Fuel Oil Tank Capacity	l	US Gal	5,4	1,43
Fuel consumption (full load - continuous use)	l/h	US Gal/h	0,9	0,24

\* or equivalent



Motorisation			BundleTutor lifter E	
Engine performance with S2 (ED)	kW	HP	4,0	5,4
Electrolyte			Sulfur acid thixotropic gel	
Battery voltage/rated battery capacity	V/Ah		6/198	
Number of batteries			8	
Battery weight	kg	lb	31	69
Charging time from discharge	h		7	
Optional charging station			Fixed position / On-board	

# **BundleTutor mobil**

*For the quick, safe and secure **independent** handling of the tube bundle*

MAUS ITALIA offers the **BundleTutor mobil** for the handling of tube bundles independently of cranes and trucks inside the plant, speeding up loading and unloading of **Mefexpress** HT bundle extractors and transportation from the extraction point to the washing area or maintenance workshop.

The MAUS ITALIA team is available to design custom solutions to provide solutions for extreme cases and ATEX explosion proof and NAVY versions for the offshore market.

For aerial handling with **BundleTutor lifter**, please refer to page

BT-2



For maintenance



# Focus - features

## STANDARD



NO damage



Independent



Nimble



NO crane/truck



Wireless

### Total protection of the bundle

The **BundleTutor mobil** sustain and supports the tube bundle during handling using two complementary and independent feature (clamps and lifting slings), ensuring perfect support along its longitudinal axis and eliminating tensions and deformations.

### Compensates for errors

The **BundleTutor mobil**, thanks to its independent adjustable ropes, compensate (through the rotation of the tube bundle) for any potential positioning errors during setting down on the extractor. This facilitates its subsequent insertion into the shell of the heat exchanger.

### Nimble

The **BundleTutor mobil** is an evolved 4x4 with front/rear driving and steering wheels that allow extremely small turning circles and rapid positioning. Independent shock absorbers also allow it to compensate for unevenness in the road surface.

### Independent

Neither trucks nor cranes are required for handling the tube bundle inside the plant for loading and unloading.

### Freedom of movement

All movement and adjustment commands are managed by remote control.

## OPTIONAL



ATEX



Low Temp



Customized

### ATEX certification

The **BundleTutor mobil** can be manufactured, on request, according to the ATEX directive in an explosion proof configuration for use in environment with a potentially explosive atmosphere.

### Not afraid of the cold

The **BundleTutor mobil** can, on request, be supplied in the special version suitable for operating at the very lowest of temperatures.

### Adapts according to need

MAUS ITALIA can, on request and after technical verification, design the **BundleTutor mobil** for bundles with measurements and weights different from its standard product.



Removable driver's seat with remote control housing

4 deflection pulleys for loading short tube bundles

Steering system with toe adjustment

4 LED headlights and 2 front and rear warning lights

Fuel tank

Engine unit



Independent

Compensates for errors

The control on the independent ropes, as well as improving the aligned support of the tube bundle, also allows compensation (through rotation) for any potential positioning errors during setting down of the extractor.

## Z1 Z2 Z3 Z4

**Independent strokes** of the sling support ropes placed under the bundle **facilitate precise alignment** during subsequent insertion in the shell:

Vertical stroke

**Z +700mm (39.4")** front and rear.

2 symmetrical anti-oscillation and bundle support clamps

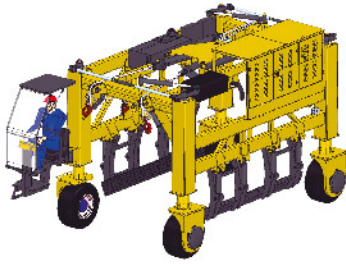
4-wheel drive and steering

Independent cushioning system on each wheel for uneven surfaces

Cut-resistant rubber tyres





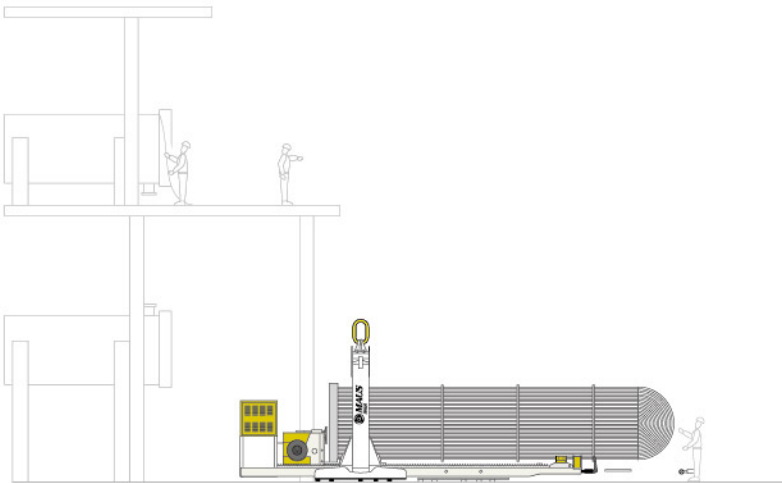


Each component is designed in 3D and tested in a virtual environment before being produced

## BundleTutor mobil

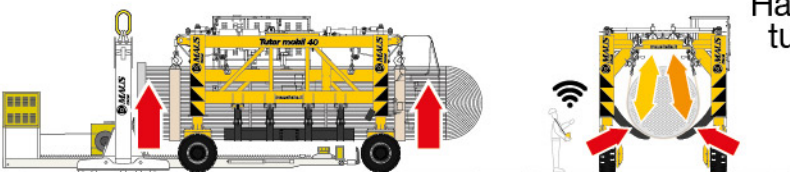
Combined use with the **Mefexpress HT** tube bundle extractor

The **BundleTutor mobil** is used for the handling of tube bundles inside the plant in **combination** with a MAUS ITALIA **tube bundle extractor** from the **Mefexpress HT** series



Alignment with the extractor and approaching

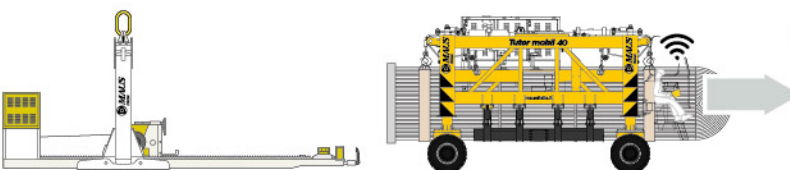
**1** The **BundleTutor mobil** aligns easily (thanks to the 4 driving and steering wheels) and surmounts the **Mefexpress HT** which carries the tube bundle which has just been extracted;



Harnessing of the tube bundle and balancing

**2** Using the support slings which are controlled by independent ropes, the **BundleTutor mobil** harnesses the tube bundle and lifts it with extreme care.

*Working symmetrically, the clamps centre and encircle the bundle, ensuring that it is balanced along its longitudinal axis;*



Lifting and handling of the tube bundle

**3** The tube bundle is transported and unloaded at its destination inside the plant in complete safety for scheduled maintenance without the use of trucks or cranes.





*Have you got  
a tube bundle  
handling problem?*





## BundleTutor mobil

**Standard features**  
of independent tube bundle  
transporters

### Air-cooled diesel engine

The standard engine consists of  
an air-cooled diesel engine sized  
to fit the proposed  
**BundleTutor mobil** model



### Cushioning system

Each of the **BundleTutor mobil**'s  
wheels has an independent  
cushioning system to ensure the  
stability of the load during moving  
on uneven surfaces



### Catalytic flame arrestor with vibration damping

Fire and explosion protection  
device to limit combustion by  
extinguishing flames



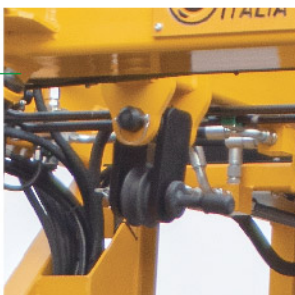
### Removable driving seat with remote control housing

Using the wireless remote  
control, the operator can choose  
whether to sit comfortably in the  
driver's seat or accompany the  
**BundleTutor mobil** at a  
distance



### Very short tube bundles

Four deflection pulleys facilitate  
the loading of shorter tube  
bundles by moving longitudinally,  
within the **BundleTutor mobil**,  
the descent point of the  
independent harnessing cables



### To see better and to be noticed

The **BundleTutor mobil** is  
equipped with 4 LED headlights  
for front and rear lighting and 2  
warning lights









# BundleTutor mobil

## Optional features of independent tube bundle transporters



### Liquid-cooled diesel engine

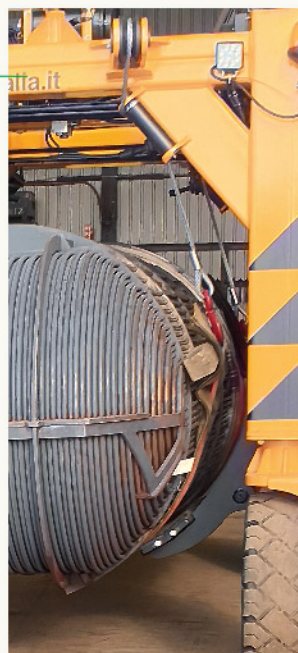
When air-cooling is insufficient or unsuitable for current regulations, MAUS ITALIA can offer engines with low environmental impact and liquid cooling



### Lifting slings

MAUS ITALIA supplies double-layer polyester slings with a hooking system suitable for the **BundleTutor mobil** model and the size of the tube bundle to be handled

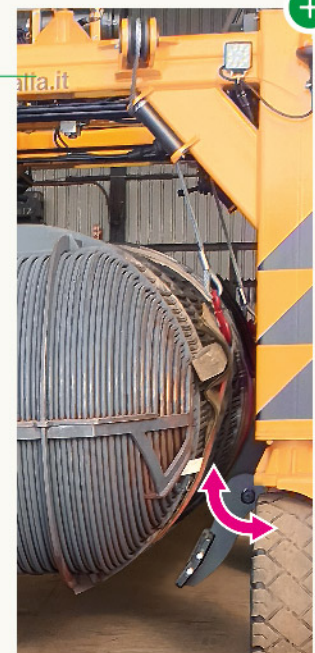
For special circumstances, the MAUS ITALIA technical staff are available to customers to suggest the most suitable solution and to provide the necessary material

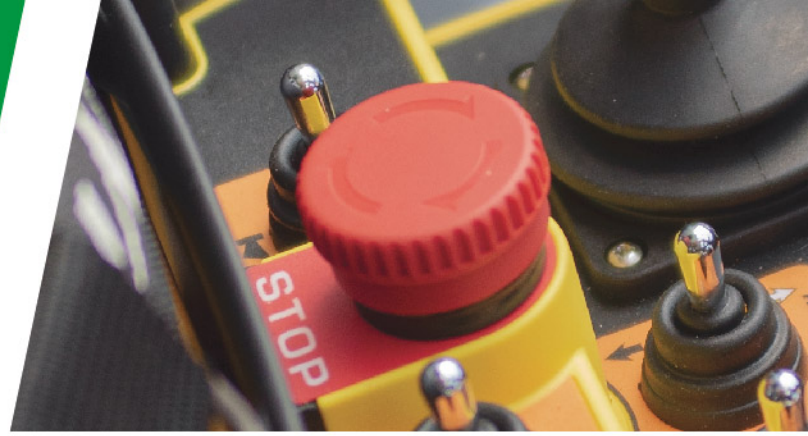


### Articulated clamps

Joints are a very efficient solution for guaranteeing an ergonomic grip

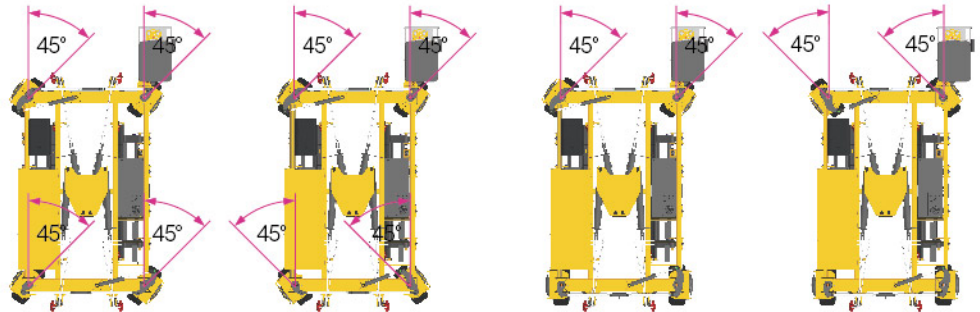
The clamps, thanks to their articulated joints, adapt to the shape of the tube bundle to be handled





Nimble

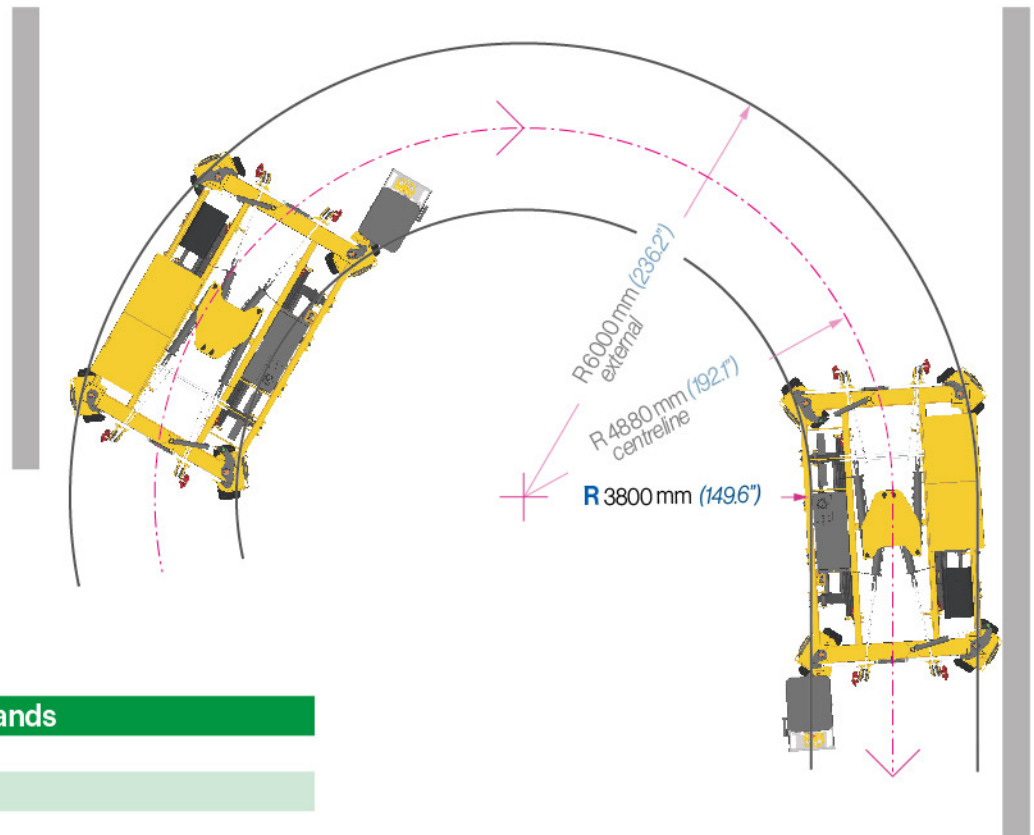
Extremely small  
turning circles



*Particular attention has been  
paid to the agility of the  
**BundleTutormobil** which, with  
4-wheel drive and steering, is  
able to navigate the journey  
within the plant.*



Wireless



### Remote control commands

- Front driving and steering
- Speed regulation
- Front lift
- Rear lift
- Rear steering
- Horn
- Emergency
- Engine speed
- Opening and closing of the bundle support clamps
- Receiver connection activation
- Engine start and stop

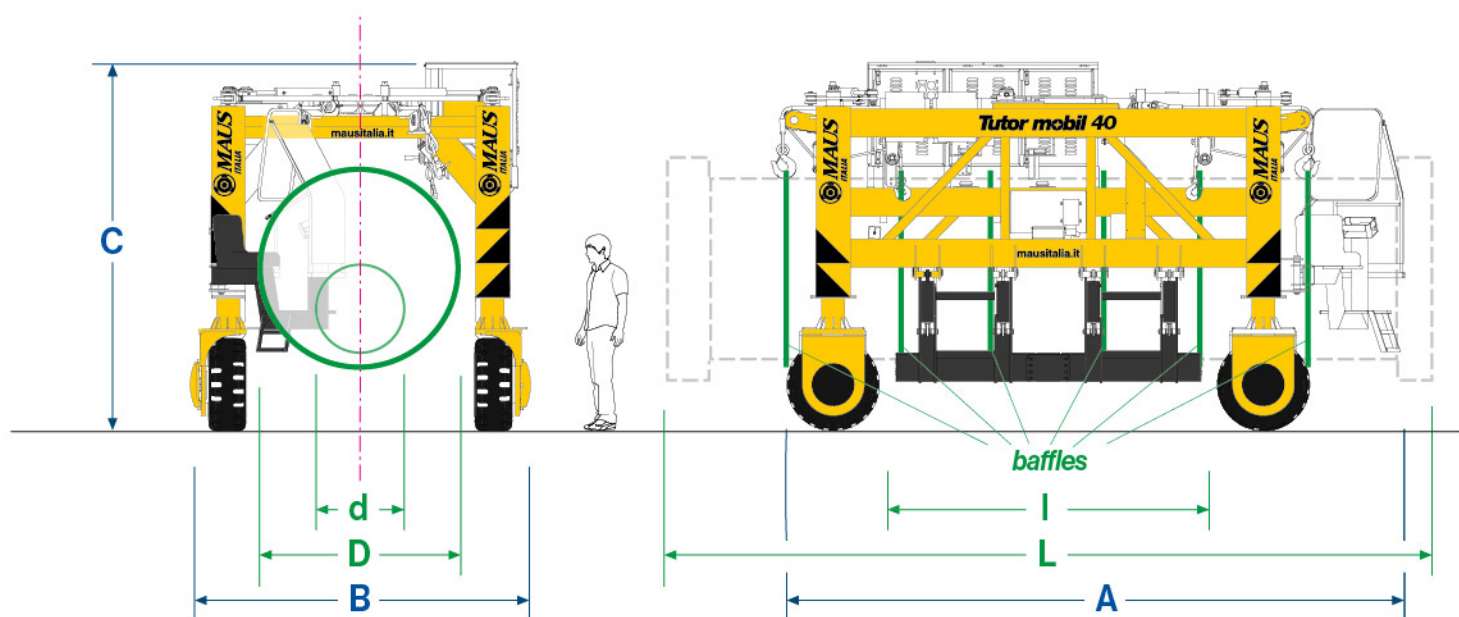






# BundleTutor mobil

**Technical features**  
of independent tube bundle  
transporters



Work capacity		BundleTutor mobil			
Ø bundle baffles (min.)	d	mm	inches	400	15.7
Ø bundle baffles (max.)	D	mm	inches	2000	78.7
Bundle length (min.)	I	mm	inches	/	/
Bundle length (max.)	L	mm	inches	7500	295.3
Lifting capacity (max.)	T	kg	lb	40	88000
Speed with no load (max.)		km/h	mph	7	4.3
Speed at full load (max.)		km/h	mph	4	2.5
Minimum turning radius	R	mm	inches	3800	149.6
4 wheel steering (max.)				±45°	
Negotiable slope (max.)				10%	

Dimensions		BundleTutor mobil			
Length	A	mm	ft	5490	18.0
Width	B	mm	ft	2720	8.9
Height	C	mm	ft	3260	10.7
Weight	T	kg	lb	8,5	18700

Motorisation		BundleTutor mobil			
Model		JOHN DEERE - Power Tech™ PWL 4.5L Engine ★			
Suction		Aftercooler air-air			
Combustion system		Direct Injection			
Cylinders		4			
Displacement	I	inches³		4,5	275
Nominal power	kW	HP		93	125
Noise @ 1m		dB(A)		92,5	
Emissions certifications		CARB EPA Tier 4 EU Stage IV			

★ or equivalent



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