



C.F. Nielsen

# Welcome to our Presentation

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## C.F. Nielsen A-S

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65 Years of Briquetting Experience



# Company Profile



**C.F. Nielsen A/S  
Solbjergvej 19  
DK-9574 Baelum**

**Next to  
Mogens Slot Knudsen,  
co-owner and managing  
director of the company.**



C.F. Niensens Maskinfabrik A/S, Denmark was established in 1889 by the progressive blacksmith Carl Frederik Nielsen.

In 1975 the company moved to a new-built factory in the beautiful outskirts of Baelum, in the northern part of Jutland.

The company was fully owned by the Nielsen family until Henning M. Larsen bought the company in 1998.

In January 2007, as a result of a management-buy-in, Mogens Slot Knudsen took over as managing director in co-ownership with Dansk Kapitalanlaeg A/S. – A new office section was added in 2008 along with the continued development of the organisation.

The company is still named C.F. Nielsen A/S - and it is now with 65 years of briquetting experience ready for an intensive growth in line with the future requirements of the world-wide market for bio briquetting equipment.

**65 Years of Briquetting Experience**



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# CFN – Production Facilities



65 Years of Briquetting Experience



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# Mechanical Presses



The construction of the mechanical briquetting press is equal to the construction of an eccentric press.

A constantly rotating eccentric is connected to a press piston, that is compressing the raw material into a conical compression die.

Model	System	Max Capacity	Briquette Size: Std. / Alt.
BP 2000	Mechanical	225 kg/h	Ø 50 mm
BP 3200	Mechanical	500 kg/h	Ø 60 mm
BP 4000	Mechanical	750 kg/h	Ø 60 mm
BP 5000	Mechanical	1200 kg/h	Ø 75 mm
BP 5500	Mechanical	1400 kg/h	Ø 75 / 65 x 65 mm
BP 5500 / HD	Mechanical	1400 kg/h	Ø 75 / 65 x 65 mm
BP 6000 / HD BP 6500 / HD	Mechanical	1800 kg/h	Ø 90 / 75 x 75 mm

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# Briquetting Press Units

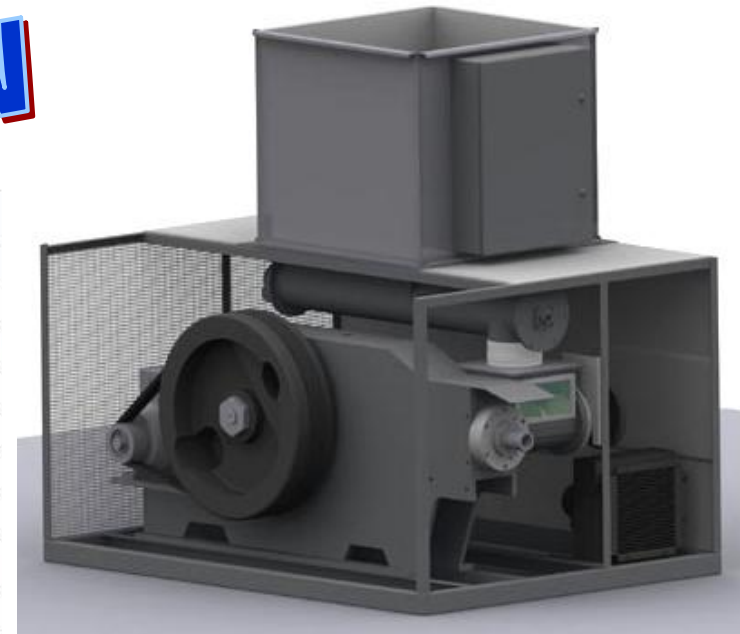


**NEW**

- Self contained units including dosing silo and touch screen panel
- Easy installation and running in based on factory testing with customer material
- Compact and sturdy design

Technical specifications			
	BP2000	BP2500	BP3200
Briquette size	Ø50 mm	Ø50	Ø60 mm
Motor power	18,5 kW	18,5/22 kW (man./aut.)	18,5/22 kW (man./aut.)
Silo volume			
Weight approx.	1300 kg		3000 kg
Central lubrication	Crosshead/bearings	Crosshead/bearings	Crosshead/bearings
Capacity range	150-225 kg/h*		400-500 kg/h*
Dim. (LxWxH)	1706x640x925 mm	2285x1225x1150 mm	2285x1225x1150 mm

\*Capacity is depending on raw material



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# Static Test of Feedstock



Test cylinder and Piston  
Has a diameter of app.  
Ø75 mm.

Material is filled in and  
The pressure is increased  
To app. 50 tonnes.

Test puck is pressed out  
After the test.

Density of puck is calcu-  
Lated.

This is only an indicative  
Test.



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# Details from CFN Testplant

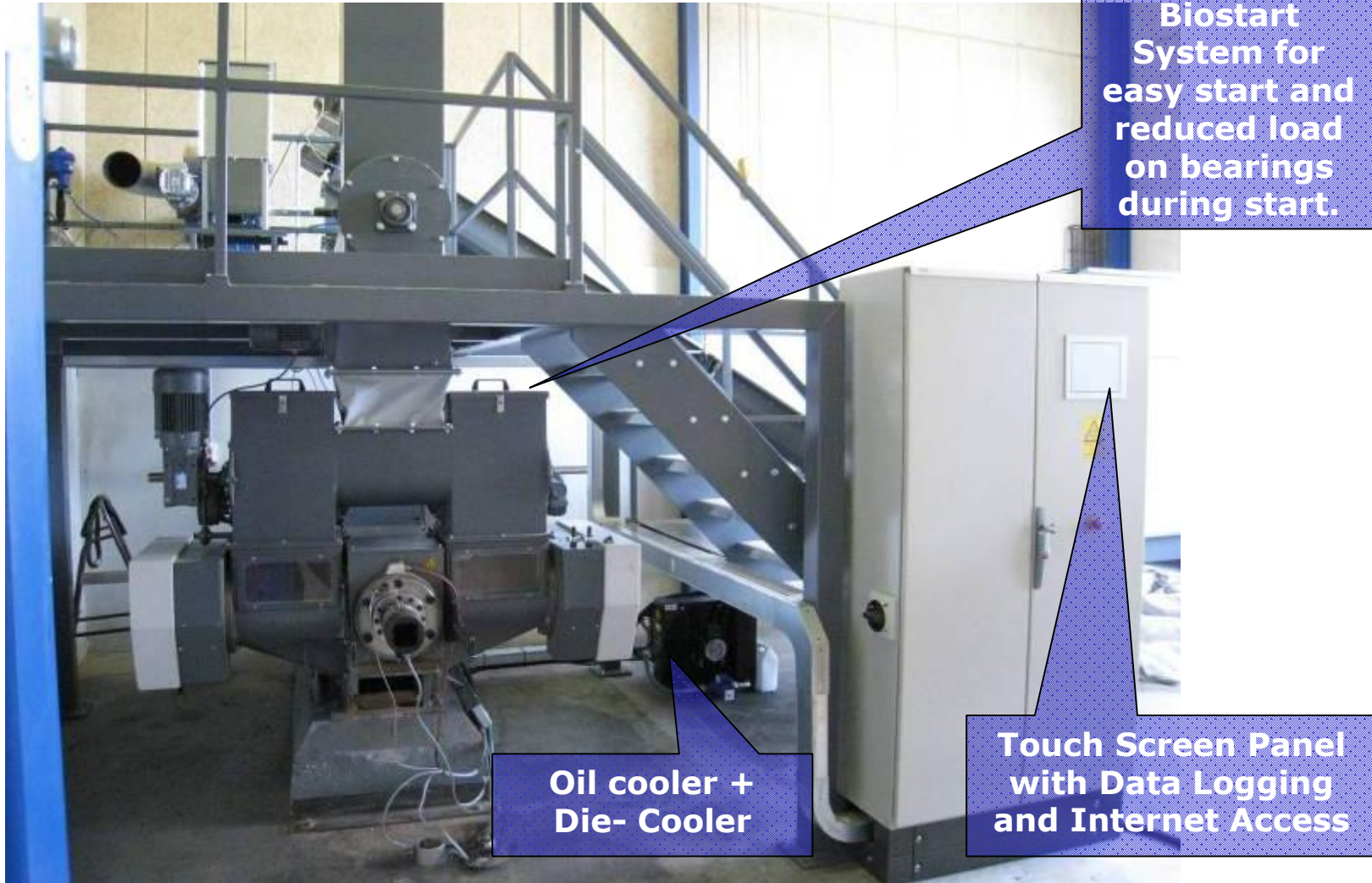


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# BP 6500 HD – at CFN Testplant



**Biostart System for easy start and reduced load on bearings during start.**

**Oil cooler + Die- Cooler**

**Touch Screen Panel with Data Logging and Internet Access**

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# Lignin Dosing + Mixer

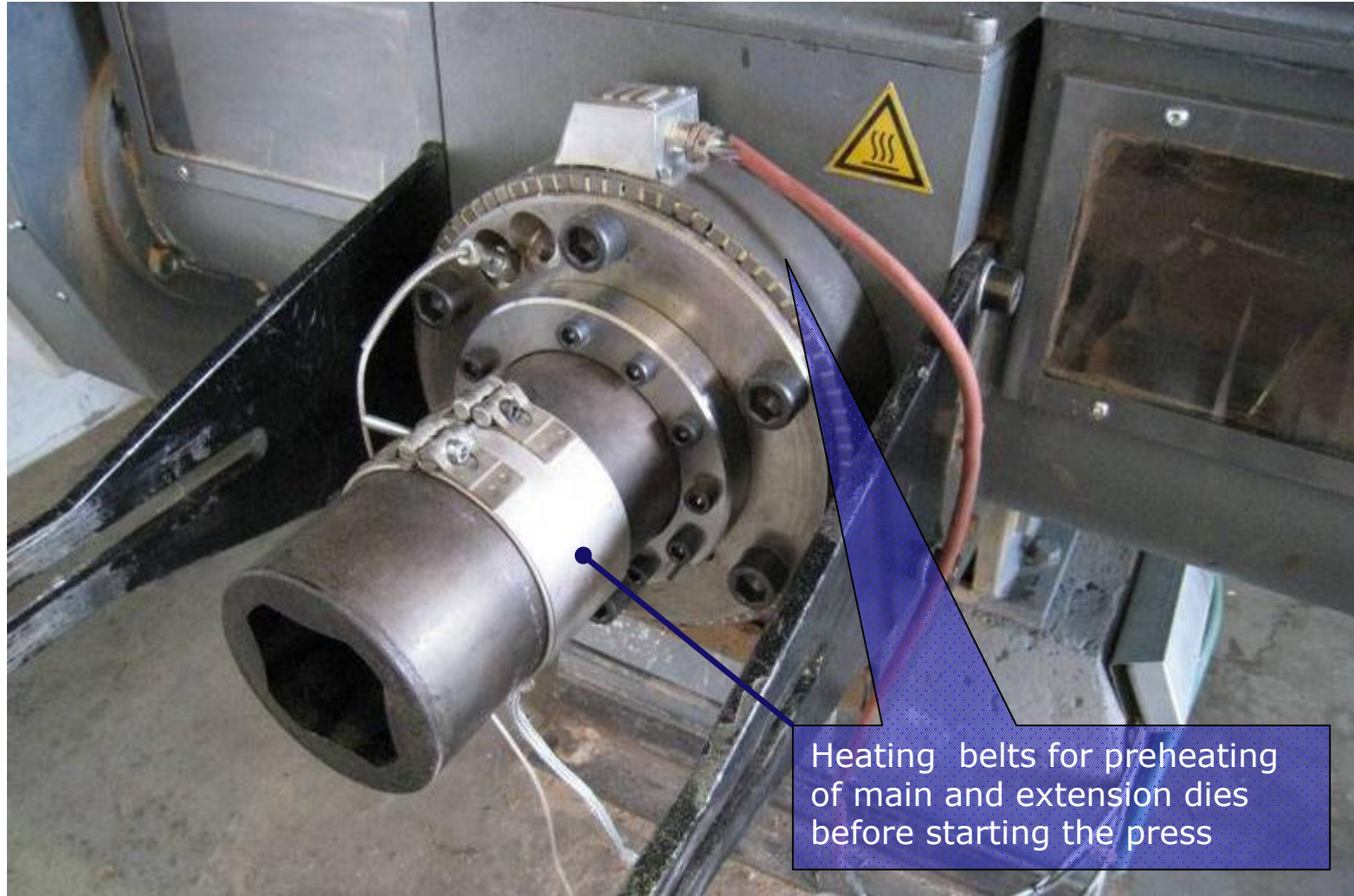


Lignin dosing system

Mixer with water adding system

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# Square die System for Logs





# After Sales Service



Our service coordinator is responsible for all contacts to our customers about service matters after the machines has been installed and turned over to customers.

## Service Coordinator In Action

- Arranging field service at our customers
- Service packages
- Range of service products
- Spare part sales
- [service@cfnielsen.com](mailto:service@cfnielsen.com)



# Calorific value of Wood Briquettes

**2 kg of wood briquettes are equal to 1 litre of fuel oil**

**The table shows values based on a moisture of less than 20%.**

**As an example an increase of moisture pct. Of just 10% (to 30%) will reduce the calorific value by 9%!.**

**You should also make sure that the material has been left outside for drying in at least 2 years for drying in the wind and the sun to be able to give the listed calorific value**

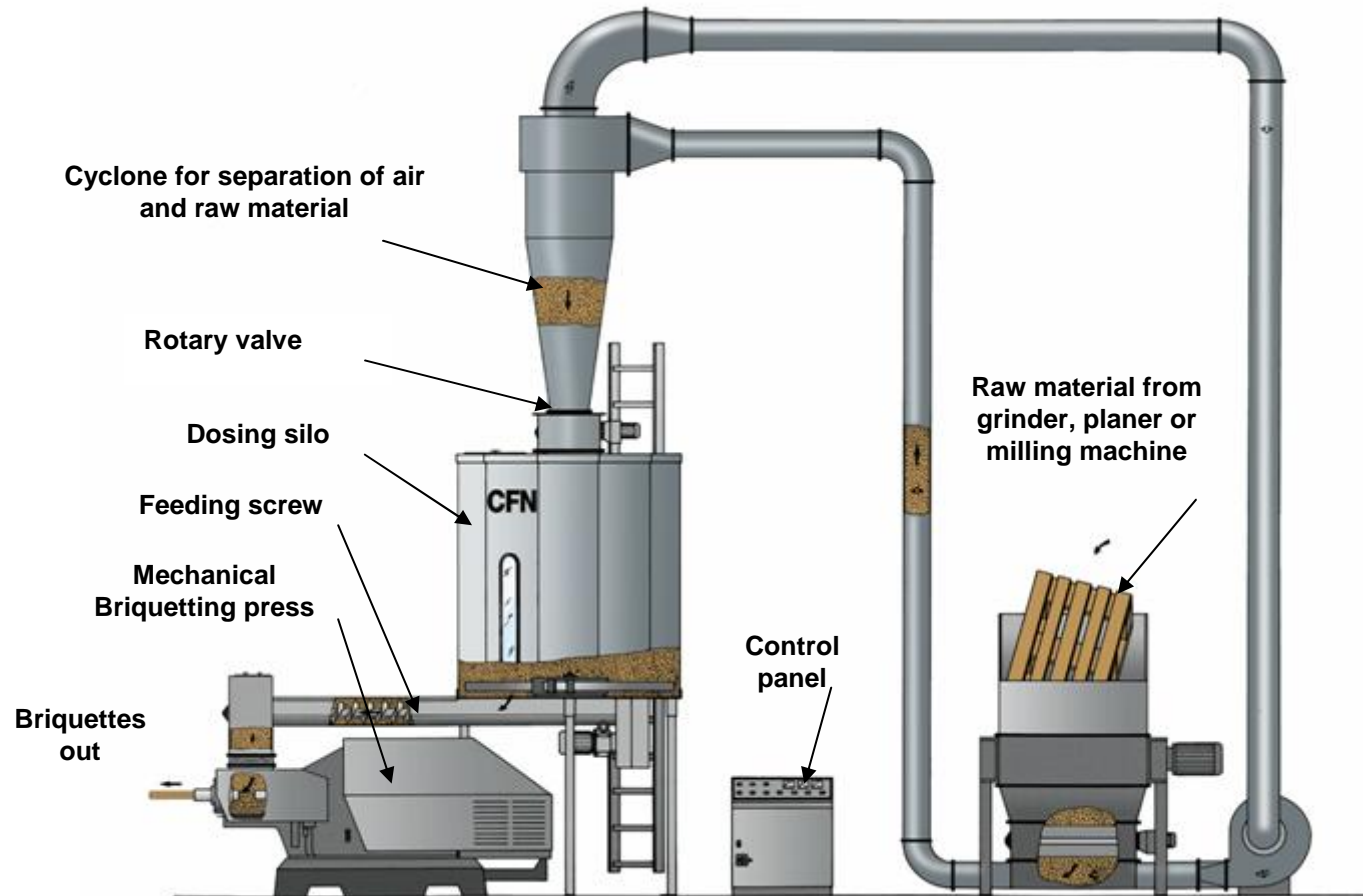
Type of wood	kWh/m <sup>3</sup>	kWh/kg
Maple	1900	4,1
Birch	1900	4,3
Beech	2200	4,2
Oak	2100	4,2
Alder	1500	4,1
Ash	2100	4,2
Spruce	1600	4,4
Pine	1700	4,4
Larch	1700	4,4
Poplar	1400	4,2
Red beech	2100	4,2
Fir	1500	4,4
Elm	1900	4,1
Willow	1400	4,1





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# Briquetting Plant with Shredder

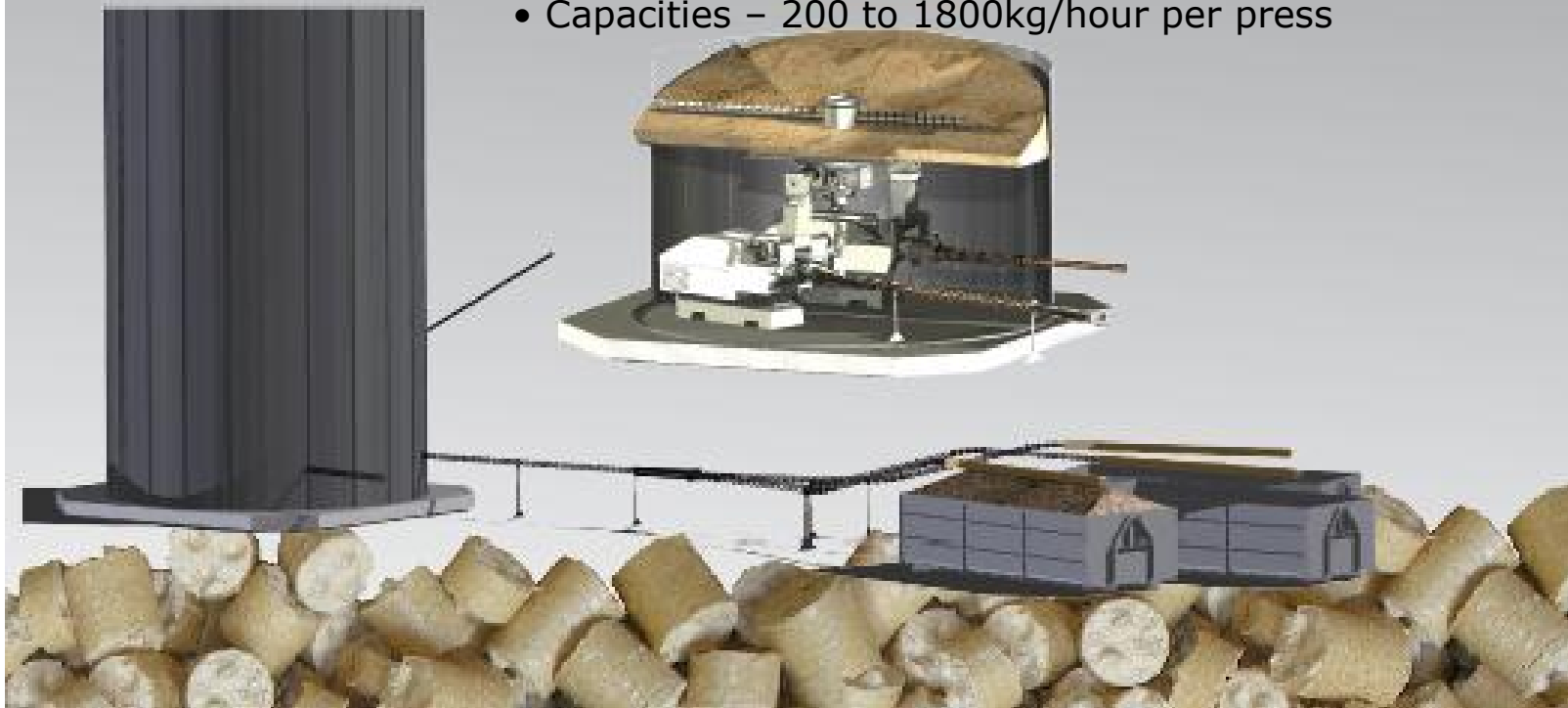


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## Briquetting Solutions

### Industrial

- A strong alternative to pellets
- Lower investment and lower operating costs
- Briquetting of wood, agri and other biomass
- Capacities – 200 to 1800kg/hour per press



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## Briquetting Plant placed under a 400 m<sup>3</sup> Silo



Detail from Silo!



We have installed several presses that are placed under a 100 – 300 m<sup>3</sup> silo. - The above example is installed in Norway and represents a very economical and environmental friendly solution.



# Fellessons Case – Sweden

5 presses in action for making industrial briquettes that are sold to power plants and heating plants on long-term contracts



# Industrial Briquettes or Bio Fuel Pucks?

- Industrial briquettes
- Density app. 0,9 – 1 ton/m<sup>3</sup>
- Sold to heating plants and/or power stations





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# Alternative Solution - if you think . .

**Pellets are too small...**



**Briquettes are too big...**



If you hear customers saying this...  
We now have the right solution for them...

**Bio fuel Quarters ® - are Just Right...**



This month CF Nielsen A/S has applied for a patent(Patent Pending) for the technology to split up a wood waste briquette in smaller pieces as shown above.

**Quarter Production**



**Hot of  
the  
press**

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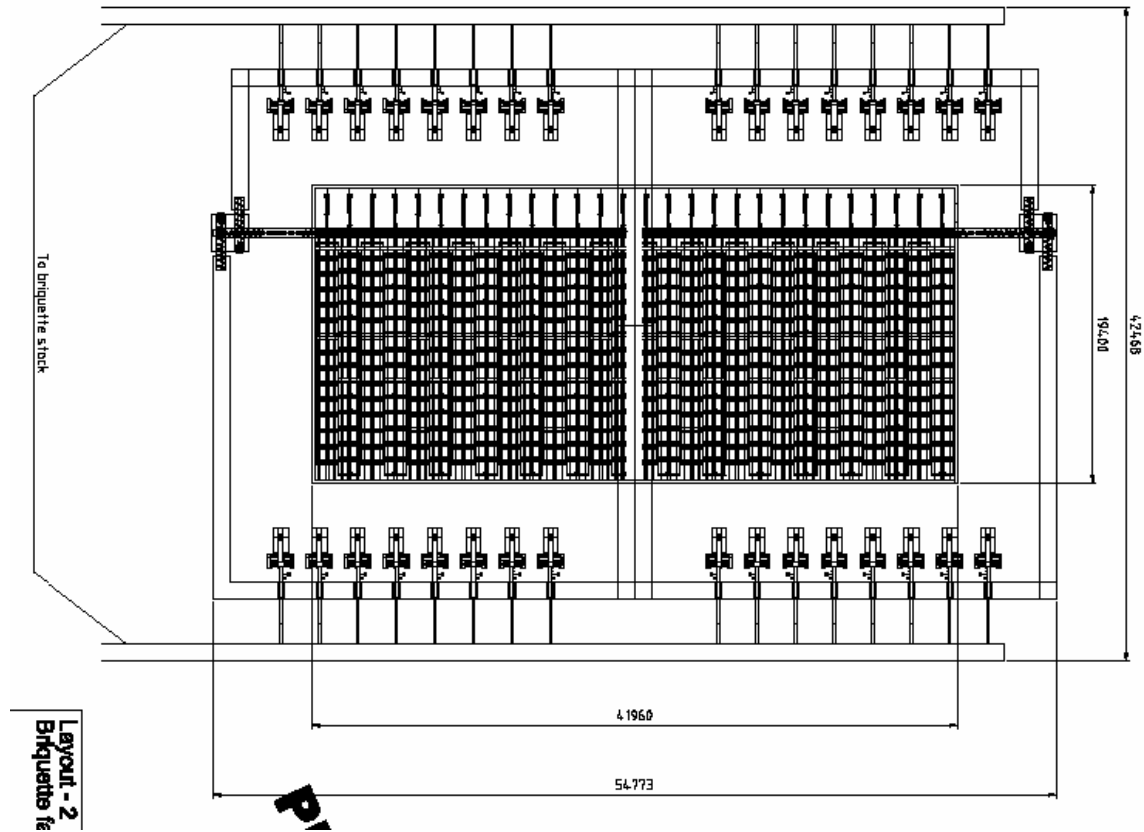
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# Large Industrial Plant – for 4 – 32 Presses

- Walking floor solution for 4 – 32 presses
- Less space need
- Less investment
- Flexible for future expansions



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# Dosing Silo for one or two Presses



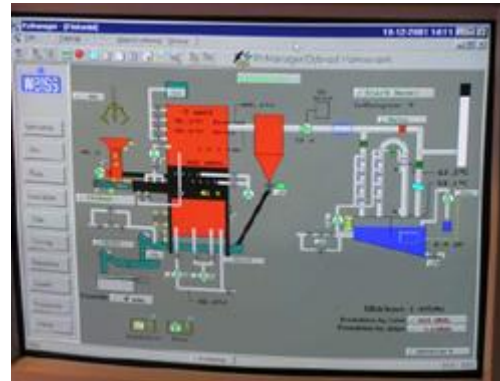
2x2 m dosing silo extendable  
to 8-12 m<sup>3</sup> volume.  
Designed for feeding of  
1 or 2 Briquetting presses

Feeding of dosing silo as well  
As start- stop of press for  
Industrial production is con-  
Trolled by 3 level sensors  
placed in the dosing silo.



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# Small Danish Heating Plant – for Briquettes

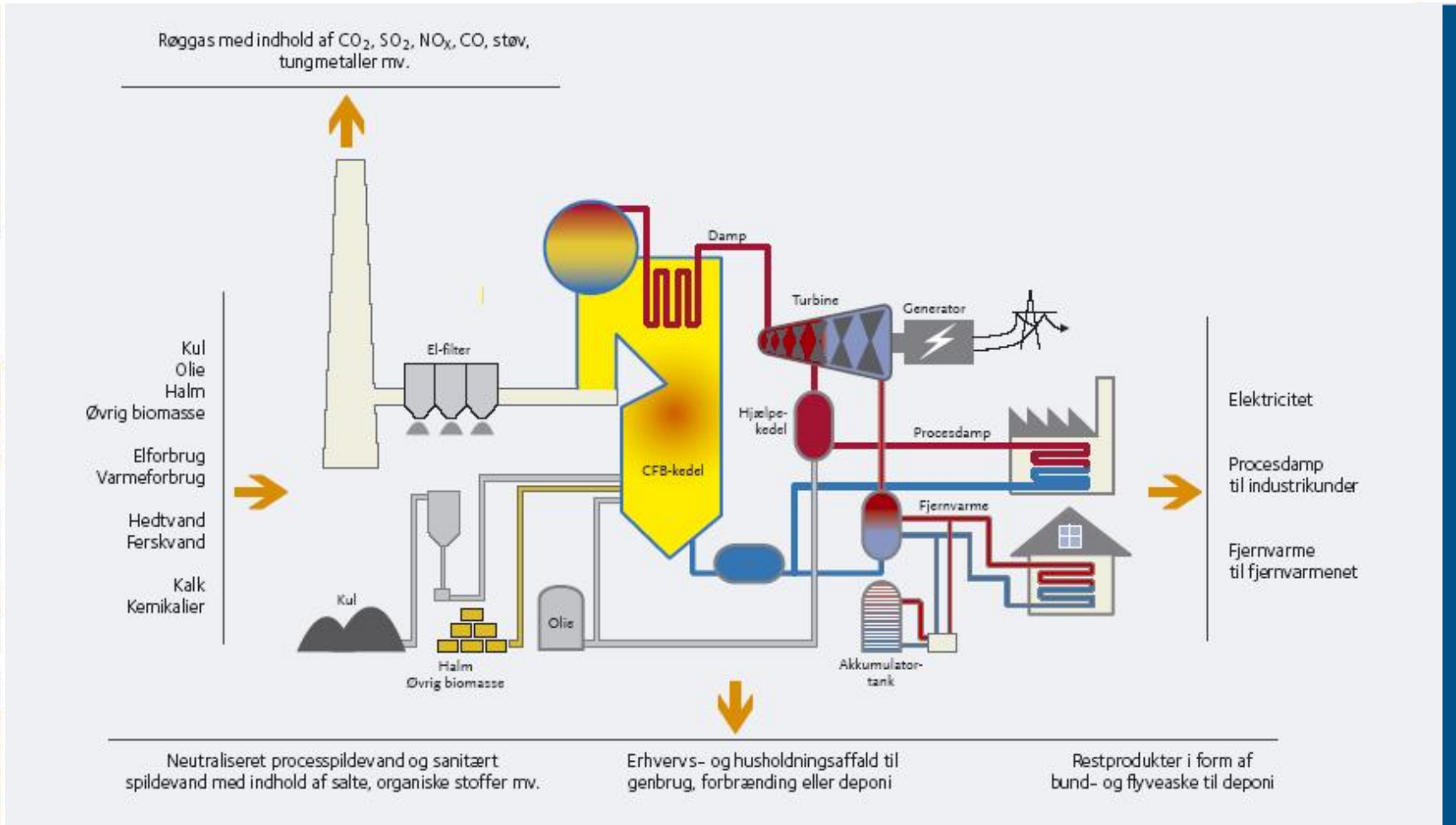


*A successful conversion!*



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# Full scale test at Grenaa kraftvarmeværk using briquettes to replace coal and straw.



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# Full scale test at Grenaa kraftvarmeværk using briquettes to replace coal and straw.

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The briquettes were dumped besides the coal grave and pushed into the grave by a front wheel loader, craned into the hammer mill, transported on open conveyor belts to a feeding silo.

From the silo the material was transported in a chain conveyor to an auger system feeding the boiler room.

## **Conclusion/recommendation:**

Overall the full scale test was very successful: The briquettes were easily crushed to the wanted particle size in the hammer mill



## Briquetting Solutions

Dust

**Briquetting of MDF and Sander Dust etc.**

**Advantages:**

- Reduce volume
- Reduce explosion risk
- Reduce health and environmental risk
- Burn to lower fuel costs



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## Briquetting Solutions Consumer Products

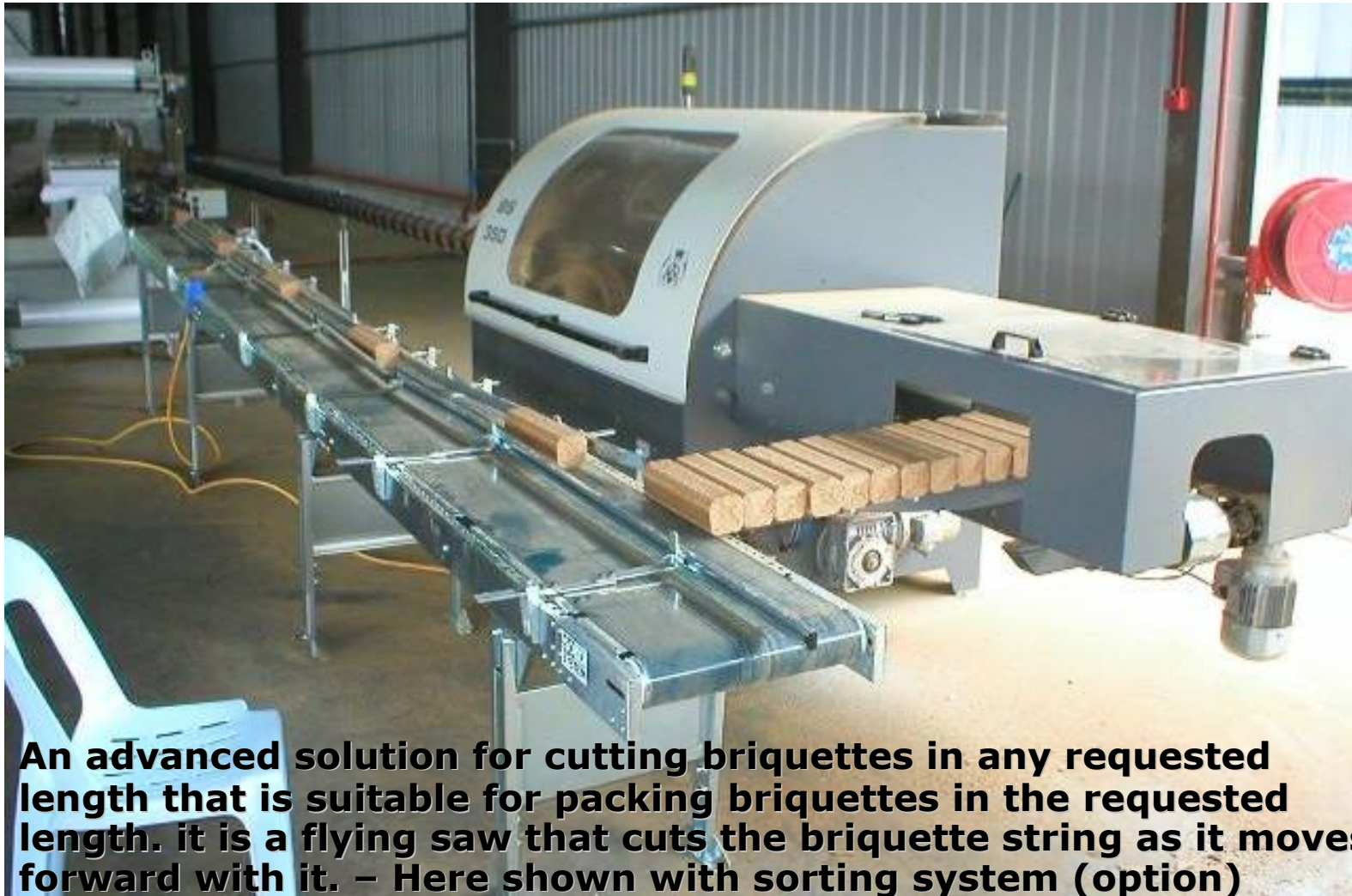
- High capacity lines
- Capacities up to 1500 kg/hour per press
- Round briquettes Ø60 to Ø90 mm
- Square briquettes 65x65 and 75x75 mm
- Complete lines with saw/breaker and packaging equipment





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## BS 350 Briquette Saw + Sorting optional



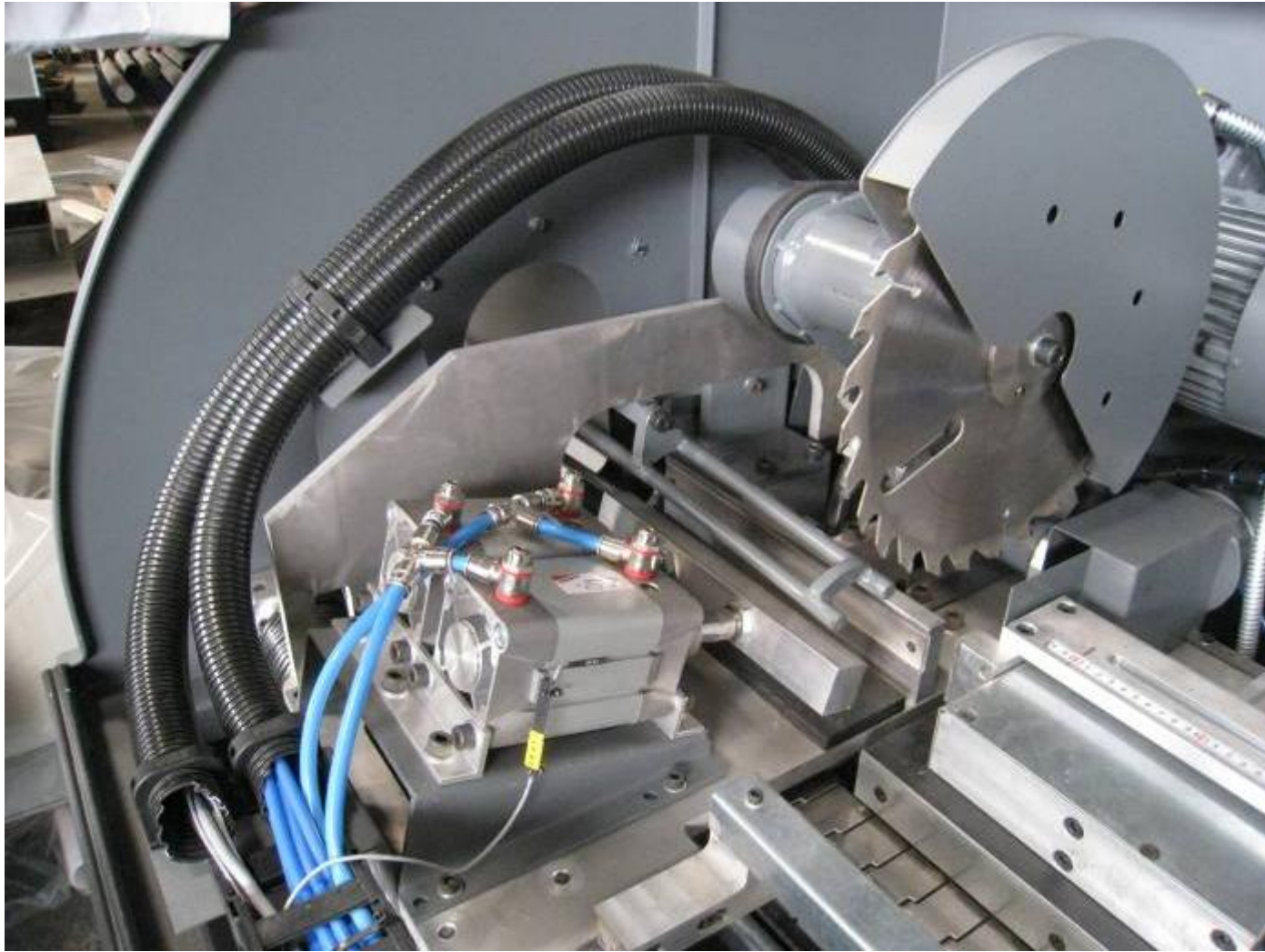
**An advanced solution for cutting briquettes in any requested length that is suitable for packing briquettes in the requested length. it is a flying saw that cuts the briquette string as it moves forward with it. – Here shown with sorting system (option)**

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# Improved Briquetting Saw

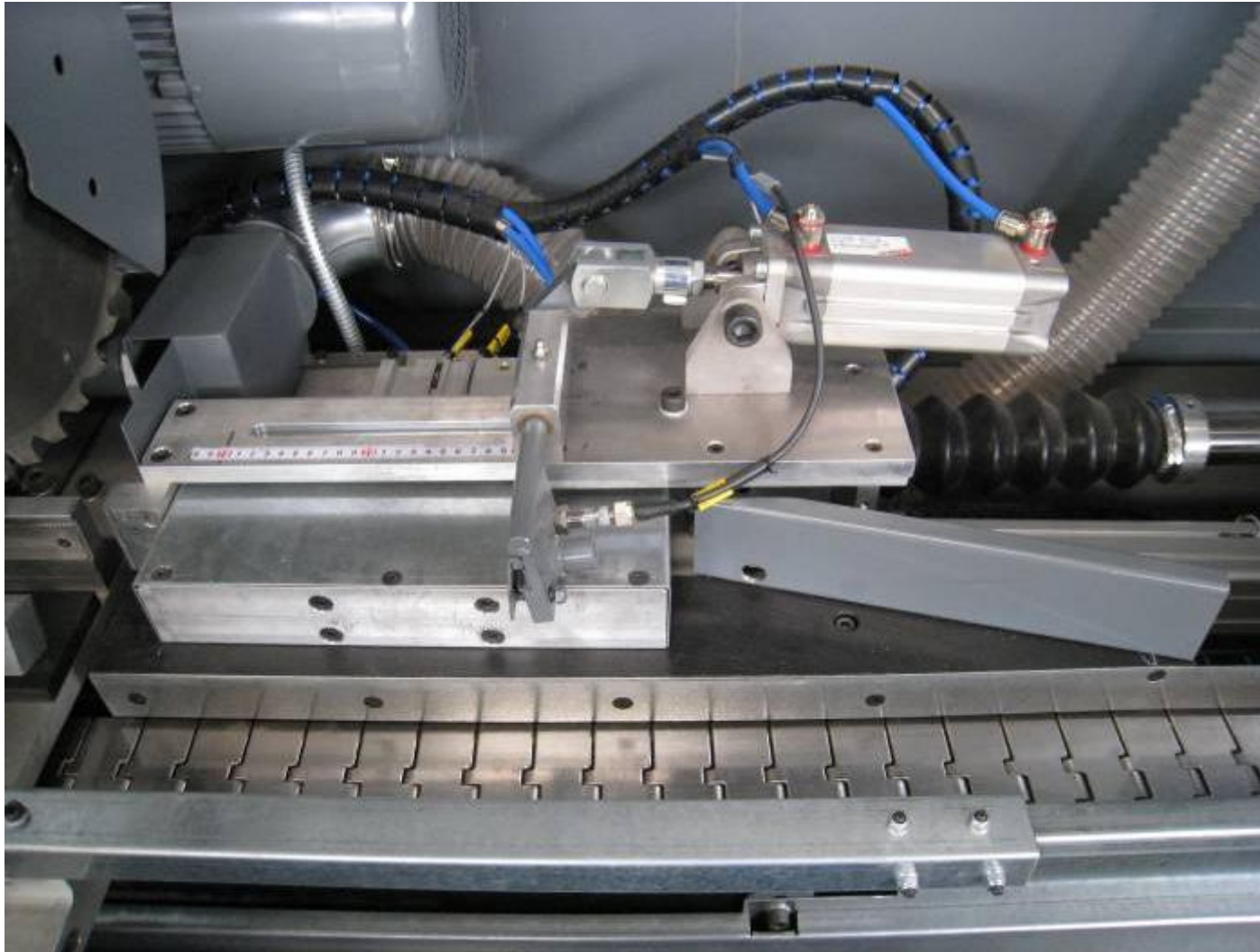


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# Improved Push System



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# Automatic Briquette Breaker

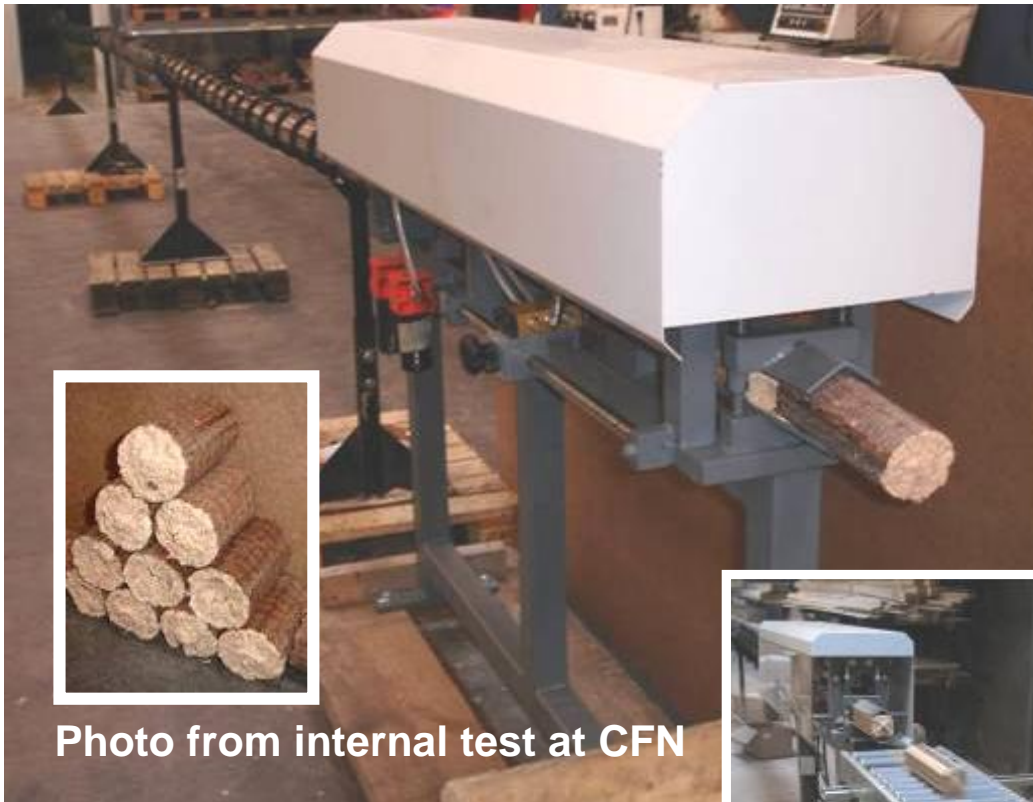


Photo from internal test at CFN

The CFN Briquette Breaker is a reliable and low-cost solution

Ideal solution for breaking briquettes in similar length before packing in cardboard boxes etc.

The length will vary +/- max 15 mm depending on type of press and raw material.





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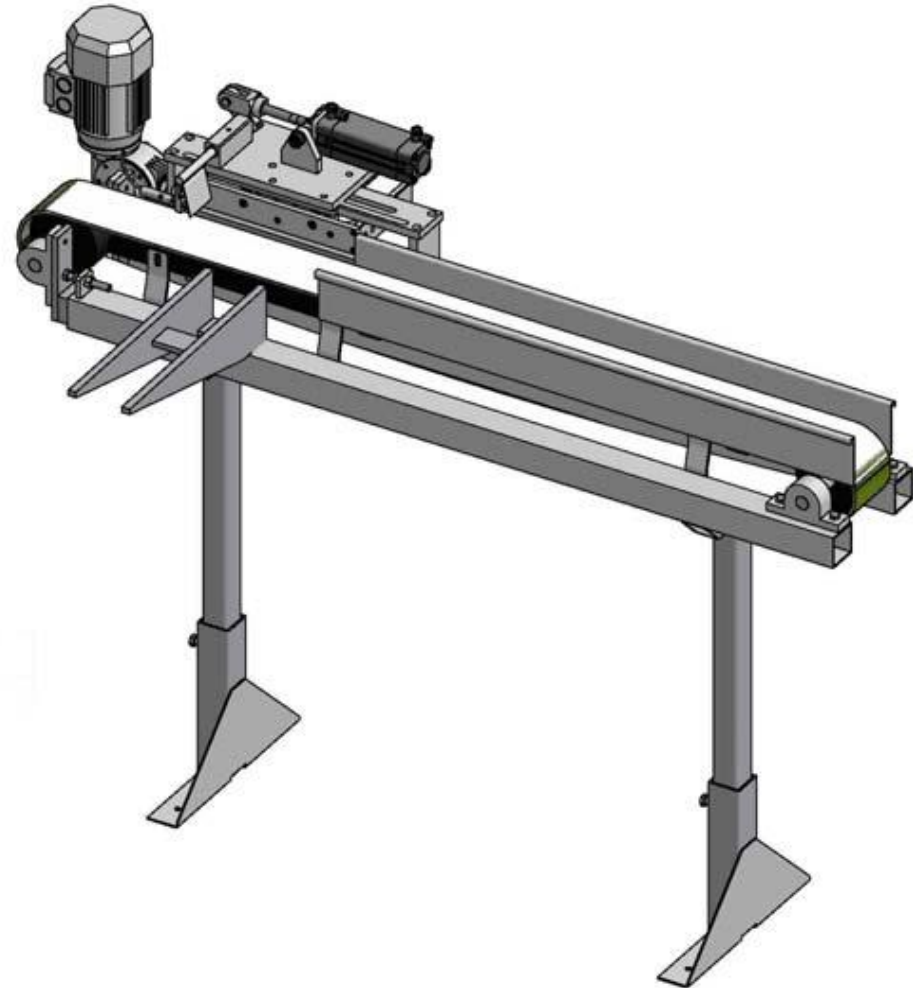
# Feeding System for Packaging System



Exist of a 1,5 m Belt with Photocell Control. For sorting the briquettes that are cut to requested length by an Automatic saw or briquette breaker.



The length of the briquettes are sorted Via a photo cell and a Mechanical System sorts out any broken briquettes as well as those briquettes that are too short or too long.







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# Automatic Packing Solutions



- Automatic packing of round or square briquettes
- Shrink wrapping
- Labelling as optional solution
- Palletizing also available
- Turnkey solutions
- Effective – but still affordable!



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# What can go wrong?

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- **Raw material**

- type of woodwaste  
(pine is not fine! – Lignin dosing system needed!)
- moisture content

(mixer + water adding system)

- particle size
- homogeneity (hardwood/softwood/dust)

- **Feeding system**

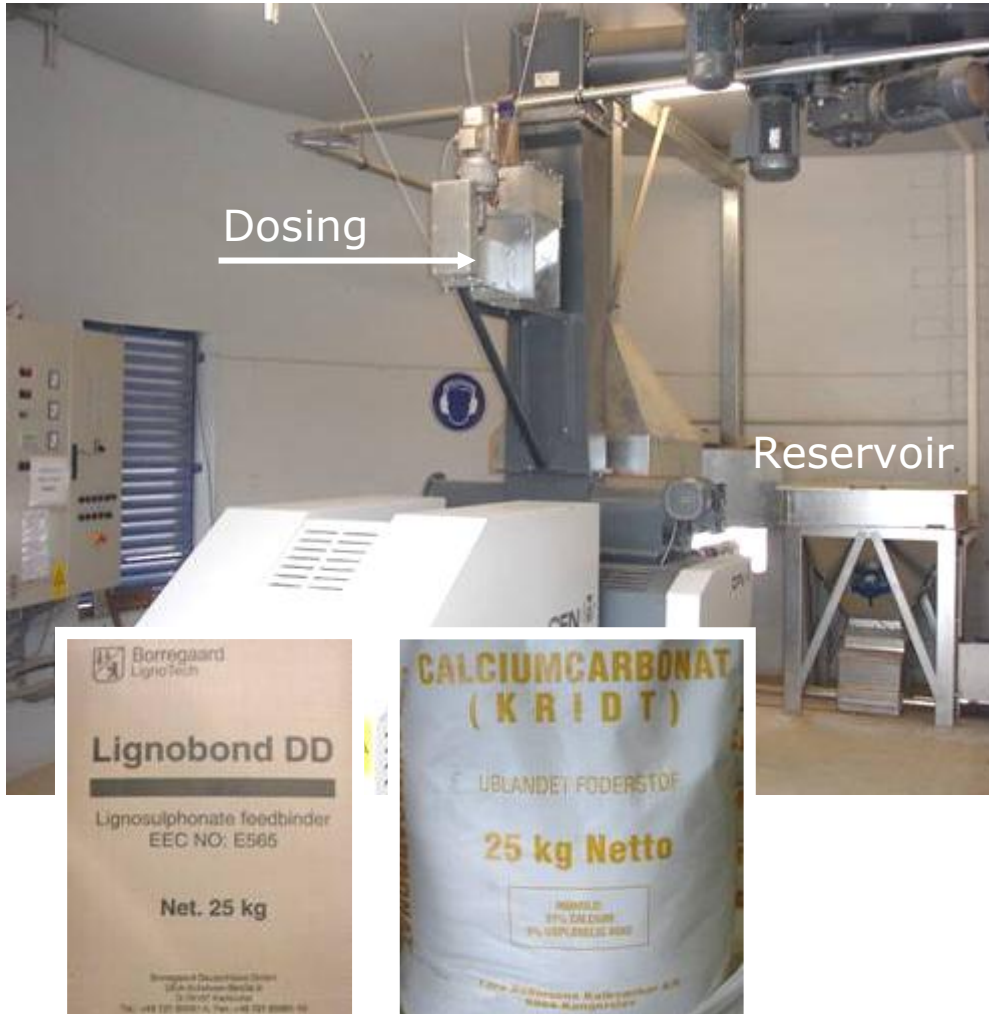
- problems with discharge system
- bridging in silo





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# Dosing System for Additives



For some raw materials it is necessary to use a binder to obtain the requested quality of the briquette.

We have are offering a compact dosing system that will add the necessary amount of binder to the raw material, before it enters the press.

Normally 1-4% of Lignin or another binder is necessary in such cases.



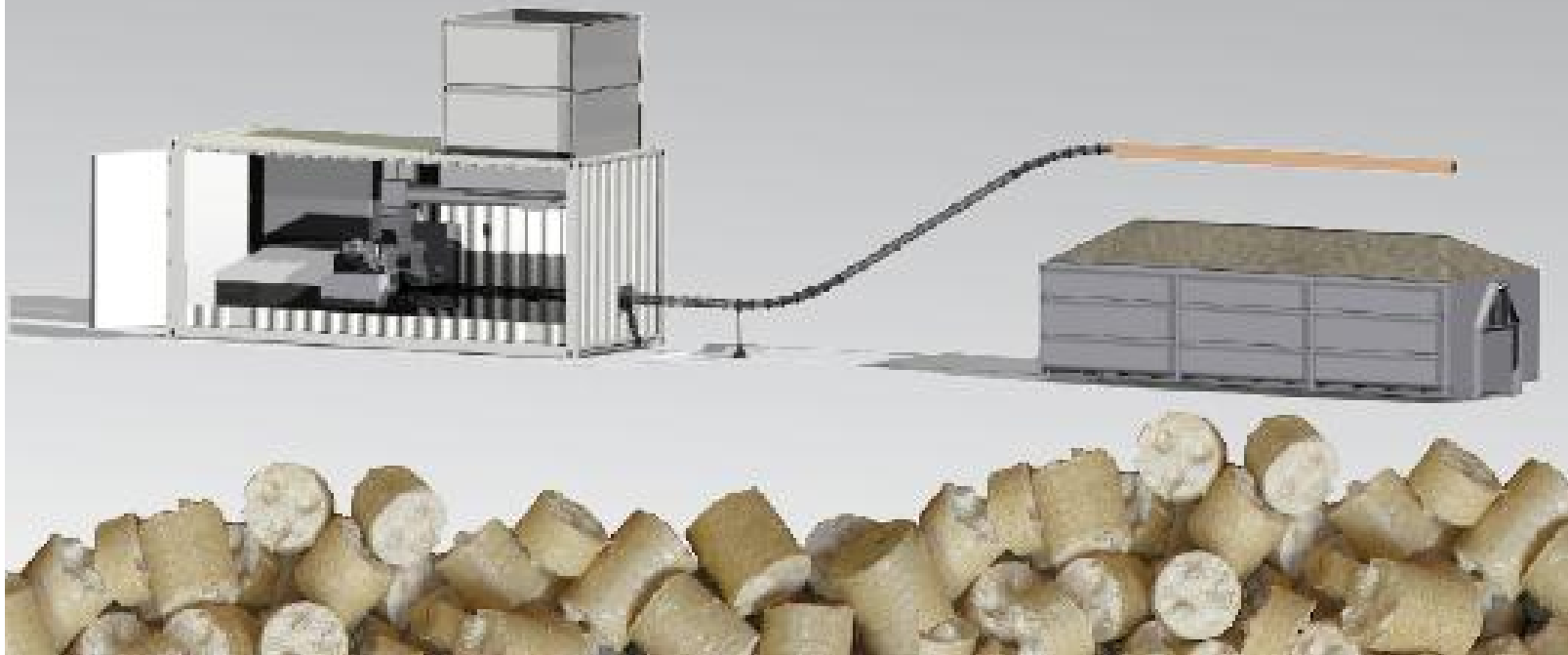
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# Mobile Briquetting Unit

## Briquetting Solutions

### Mobile

- Complete with briquetting press, silo, feeding screw and cooling line
- Compact unit placed in a 20 foot container
- Can easily be moved from location to location
- Perfect for customers with waste in different locations



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# Details from BP 5000 Mobile Plant

- BP 5000 Mobile briquetting plant in Como in Northern Italy.
- The plant mainly uses beech waste.
- The briquettes are sold for private consumers.



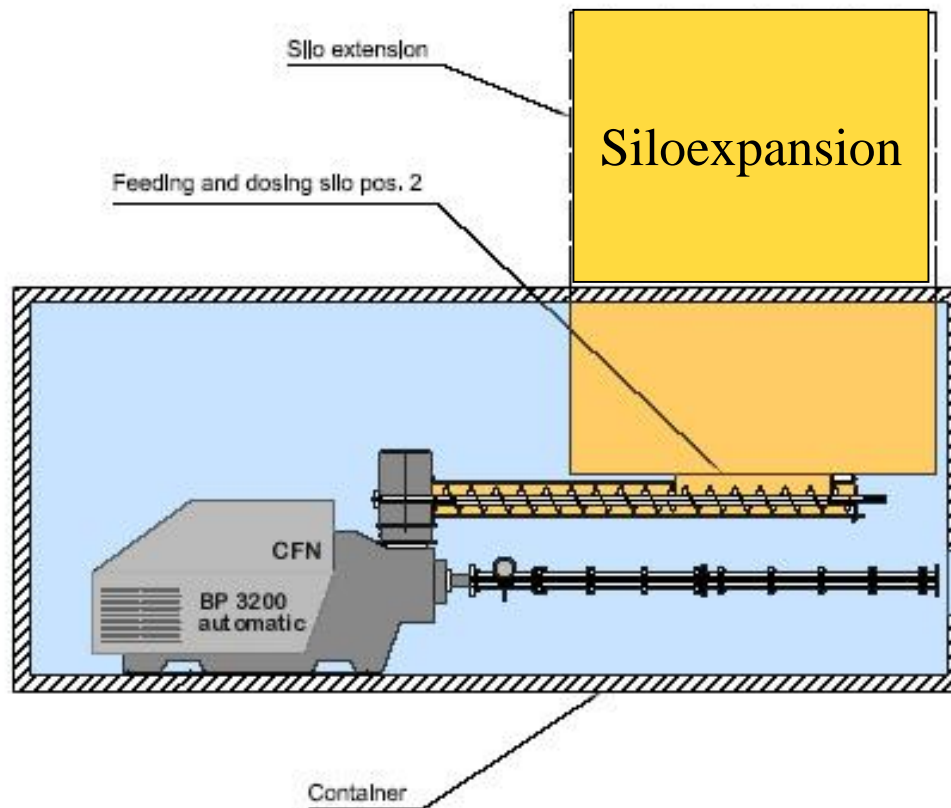
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# Mobile Briquetting Plant



*Based on customer requirements we have built a mobile briquetting unit existing of the BP 3200 automatic with PLC controls (max 500 kg/h) and an integrated dosing silo, that can be expanded on top of the 20 ft. Container.*

*The BP 3200 mobile unit, just have to be connected to a 63 A/400 V power socket to be ready for operation.*

*It is also possible to integrate the BP 4000<sup>41</sup> or BP 5000 in the container.*

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# BP 6000 HD in 20 ft. Container



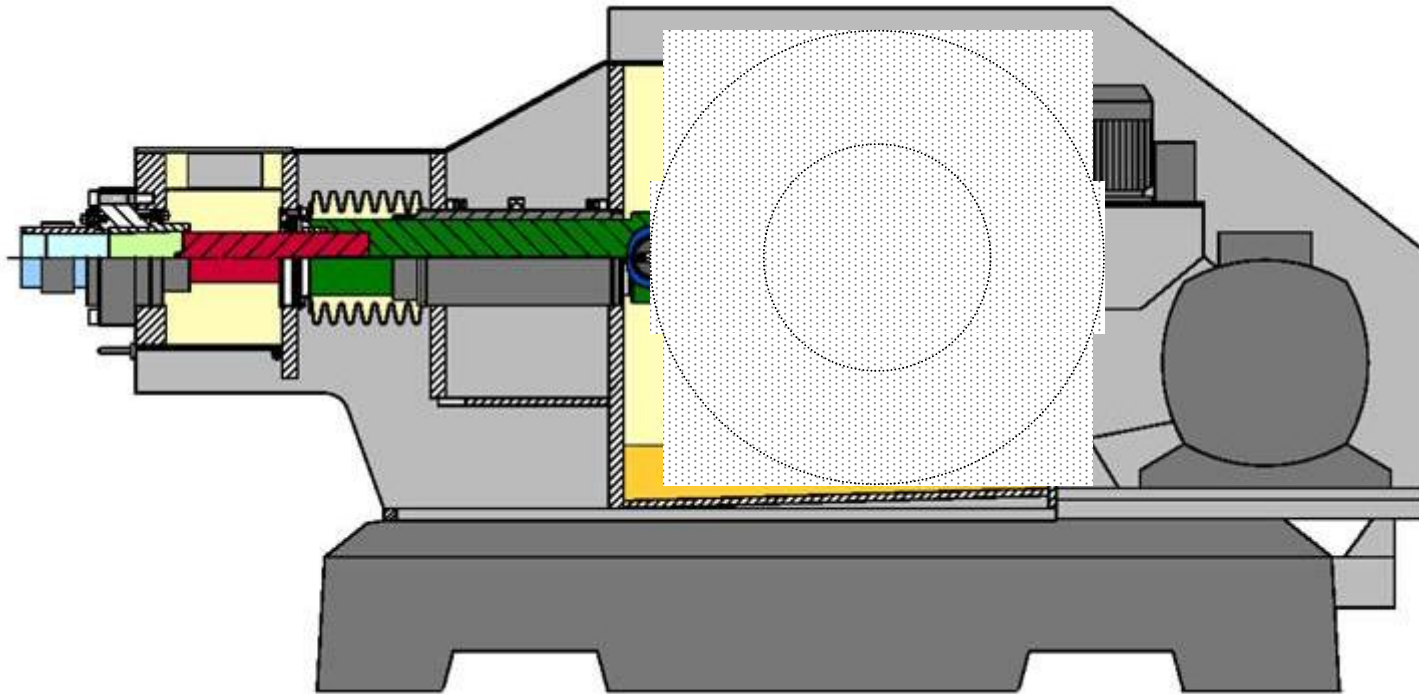
It is a tight fit to place the BP 6000 HD press in a 20 ft. Container. An extra opening has been made in the side of the container for service-access.

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# Structure of a CFN Mechanical Press



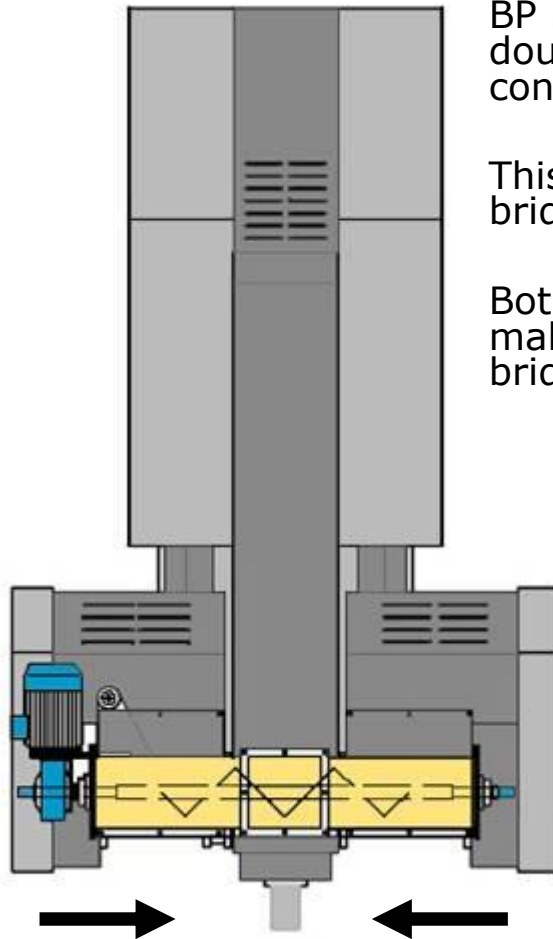
The structure of a CFN mechanical press is the same as the one of an eccentric press. The piston, connected to a constantly rotating eccentric, presses the raw material through a conical die. For the BP 5500 and BP 6000 two large flywheels secure a very quiet and balanced operation.





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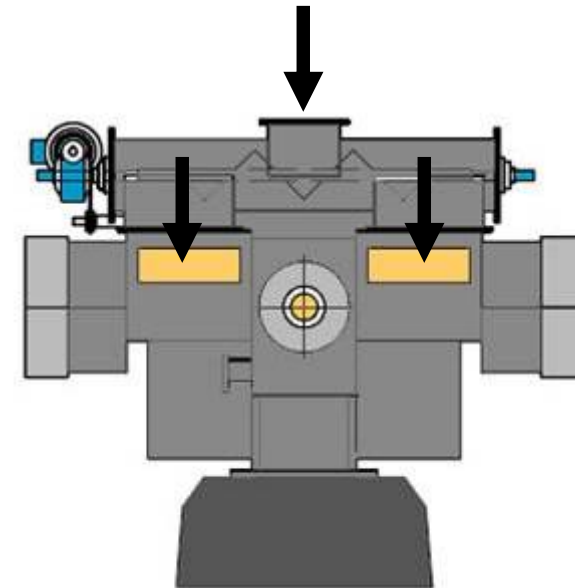
# Construction of Mechanical Press



BP 5500 and BP 6000 presses are equipped with a double feeding system with two rotating screw conveyors.

This system is very suitable when you have to make briquettes from very light material.

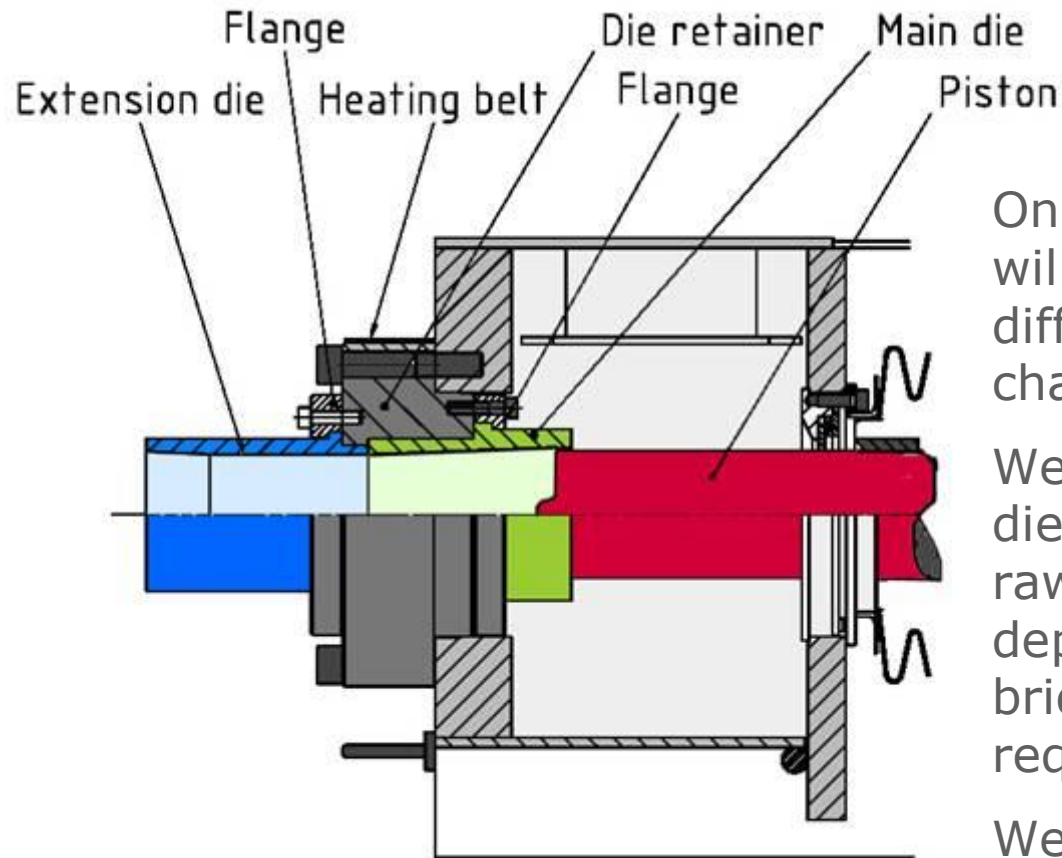
Both of these presses can be equipped with a device to make a 20 mm internal hole in the centre of the briquettes





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# Die System for the BP Series



On a mechanical press you will have to install a different conical die to change the pressing force.

We are offering different dies for different sorts of raw materials and depending on which briquette quality is required.

We are also offering a die cooling system for hardwood etc.



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# New BP 6500 HD with ABCS



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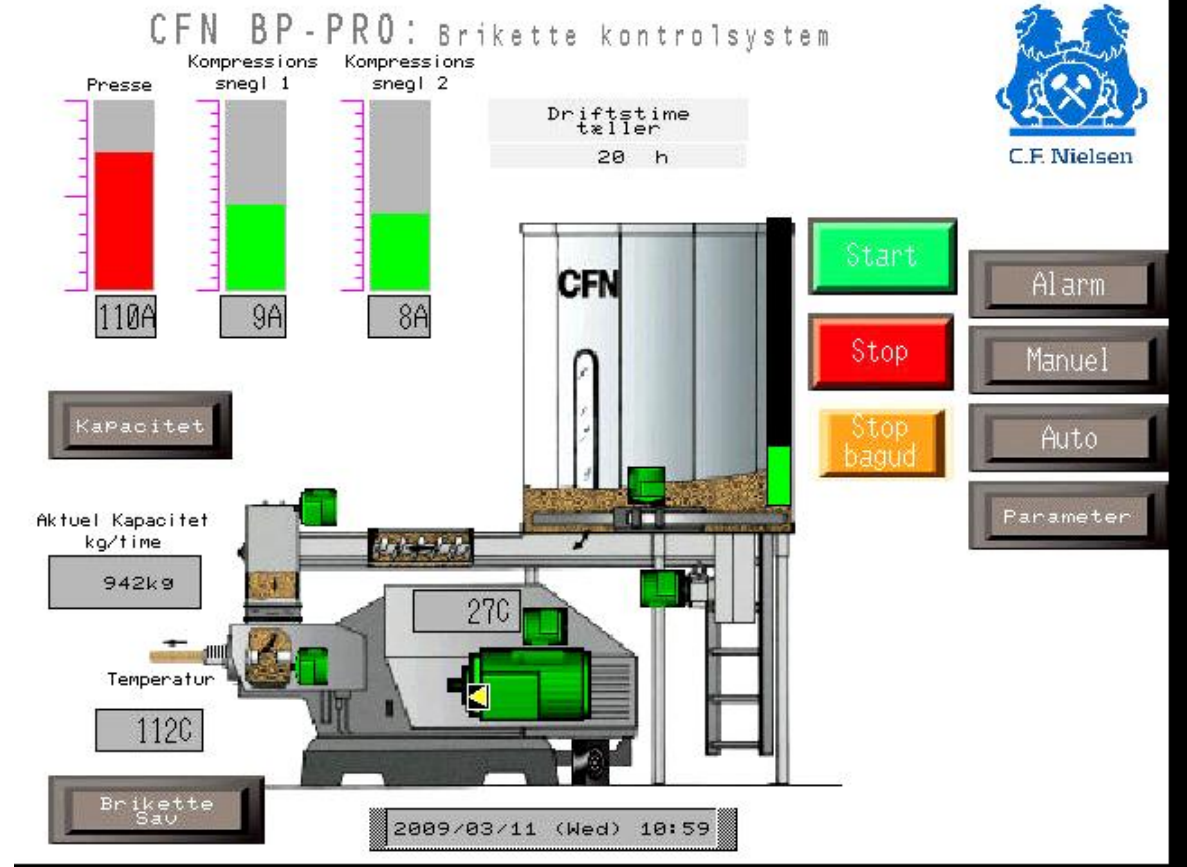


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# ABCS - Advanced Briquetting Control System

## Highlights:

- Easy installation, configuration and operation. All important information regarding the operation of the press and the saw or breaker will be shown directly on the screen.
- Graphic overview of the equipment with animations for the moving parts. When a motor is active it will show up in a green colour on the screen.
- All normal operation options are placed as buttons on the screen for easy access.





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# ABCS - Advanced Briquetting Control System

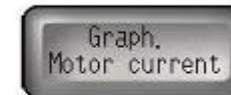


- Parameters menu with access for normal user operations.
- Access to normal data log
- Access to graph on motor current for main motor and compression screw
- Access to change time and date. Changing date and time will not change the running hours of the press.

CFN BP-PRO: Briquette controlsystem



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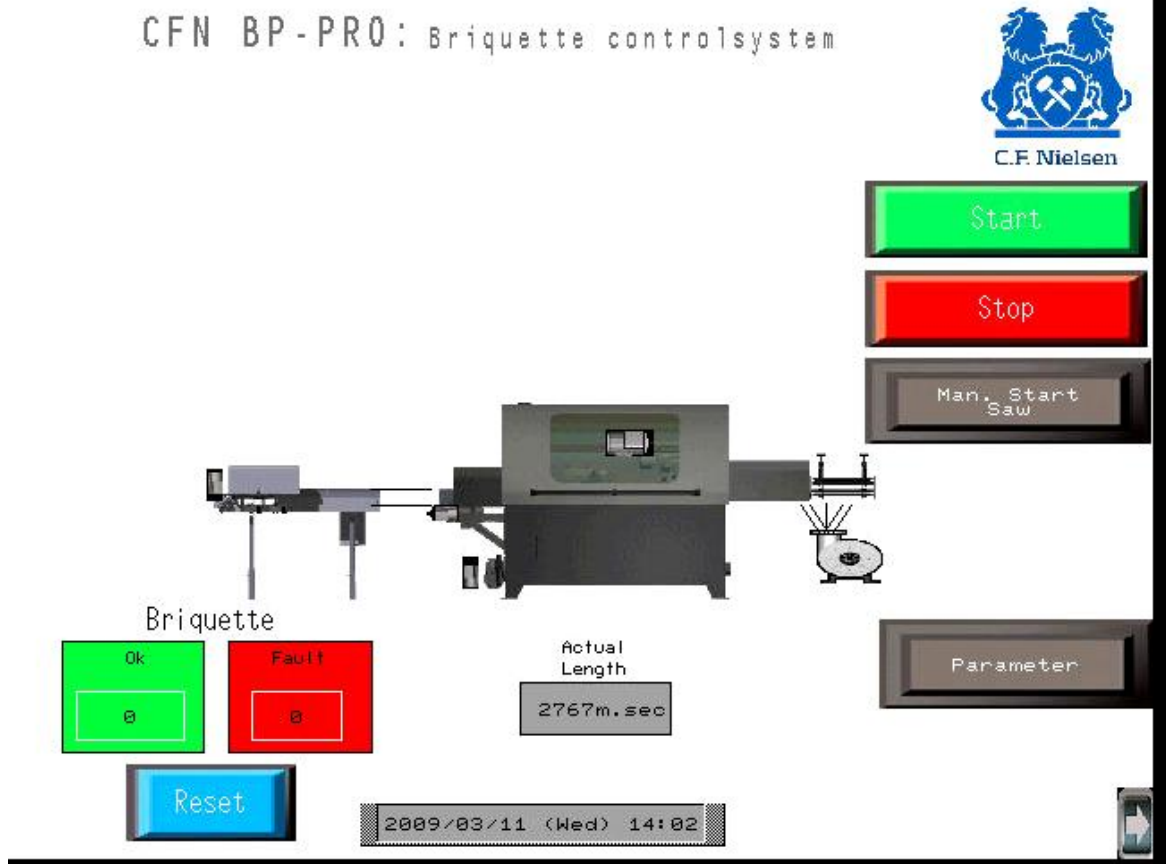


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# ABCS - Advanced Briquetting Control System



- Number of good and bad briquettes in the saw is monitored
- The actual length of the briquette can be monitored
- Saw and breaker is supported



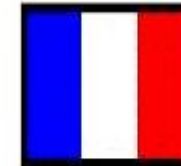
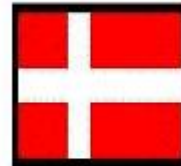


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# ABCS - Advanced Briquetting Control System



- The languages can be changed on the fly. This means if the operator notices an error it can easily be translated to another languages by changing the languages of the system.
- Just press the CFN logo on the main screen and choose the language by pressing the flag.
- Up to 16 languages can be implemented. 7 languages have currently been implemented.





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# ABCS - Advanced Briquetting Control System



- The advanced log file stores all operating statuses, errors and changes in setup files. This gives complete history of the running parameters in the machine.
- The log is stored on a 2GB CF-card. When the card is full it will give a warning and then start overwriting the first log messages.

GP-Viewer EX  
File Screen Mode Update Tool Help

CFN BP-PRO: Briquette controlsystem

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### Data log

06/03/09	07:26	Emergency	07:26
06/03/09	10:52	Overload Comp. Screw	10:52
06/03/09	11:19	Emergency	11:36
06/03/09	11:36	Cooling line secur.	11:36
06/03/09	11:36	Emergency	11:36
09/03/09	07:18	Cooling line secur.	07:23
09/03/09	07:18	Emergency	07:23
10/03/09	07:20	Cooling line secur.	07:24
10/03/09	07:20	Emergency	07:24
10/03/09	08:12	Emergency	08:19
10/03/09	08:19	Cooling line secur.	08:19
10/03/09	08:19	Emergency	08:19
10/03/09	08:44	Cooling line secur.	08:44
10/03/09	08:44	Emergency	08:44
10/03/09	10:10	Cooling line secur.	10:11
10/03/09	10:10	Emergency	10:11
11/03/09	07:04	Cooling line secur.	07:04
11/03/09	07:04	Emergency	07:04
11/03/09	10:12	Cooling line secur.	10:12
11/03/09	10:12	Emergency	10:12

START EXIT  
UP  
DOWN  
CLR  
CLR ALL

Viewer:RAAA144:Extended D-Script Error (The SIO operation function is used in a condition where no Device/PLC has been

Server IP Address:192.168.16.9

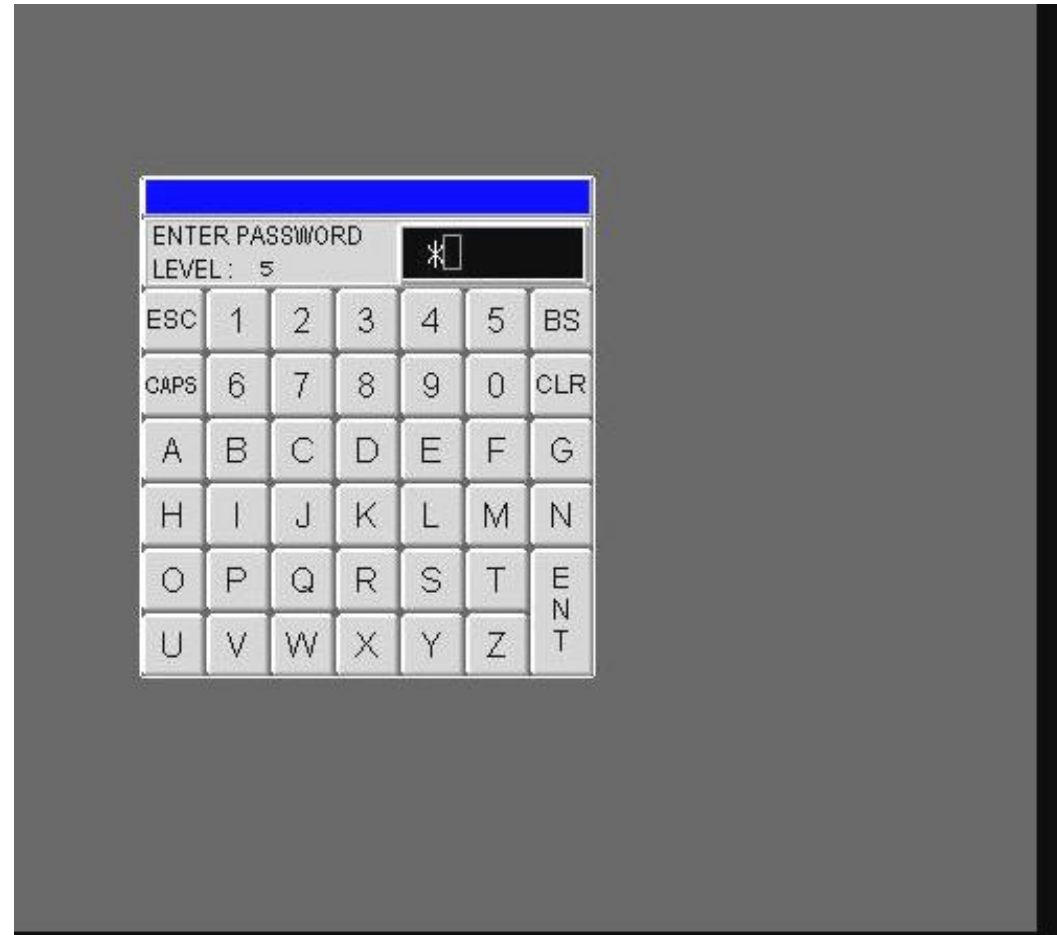


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# ABCS - Advanced Briquetting Control System



- Parameters menu with access for normal user operations.
- Expert with advanced setup is protected from the operator so only trained personnel can access this setup. Up the 15 levels of password is supported but only 2 levels are currently implemented
- Expert level is for very trained customers. CFN engineering level is not for customer.





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# ABCS - Advanced Briquetting Control System

## SMS system.

- Up to 10 different persons can receive SMS.
- Briquetting press can be started and stopped by sending an SMS to the machine.
- Operator or others can send codes to press and get status answers back.
- Personnel messages can be setup.

CFN BP-PRO: Brikette kontrolsystem 1



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## SMS

SMS  
ALARM BESKEDER

Alarm Log

Expert

SMS  
MODTAGERE

Auto start  
varmebånd

SMS  
ALARM TEST

Graph  
motorstrøm

Indstilling  
ur/dato

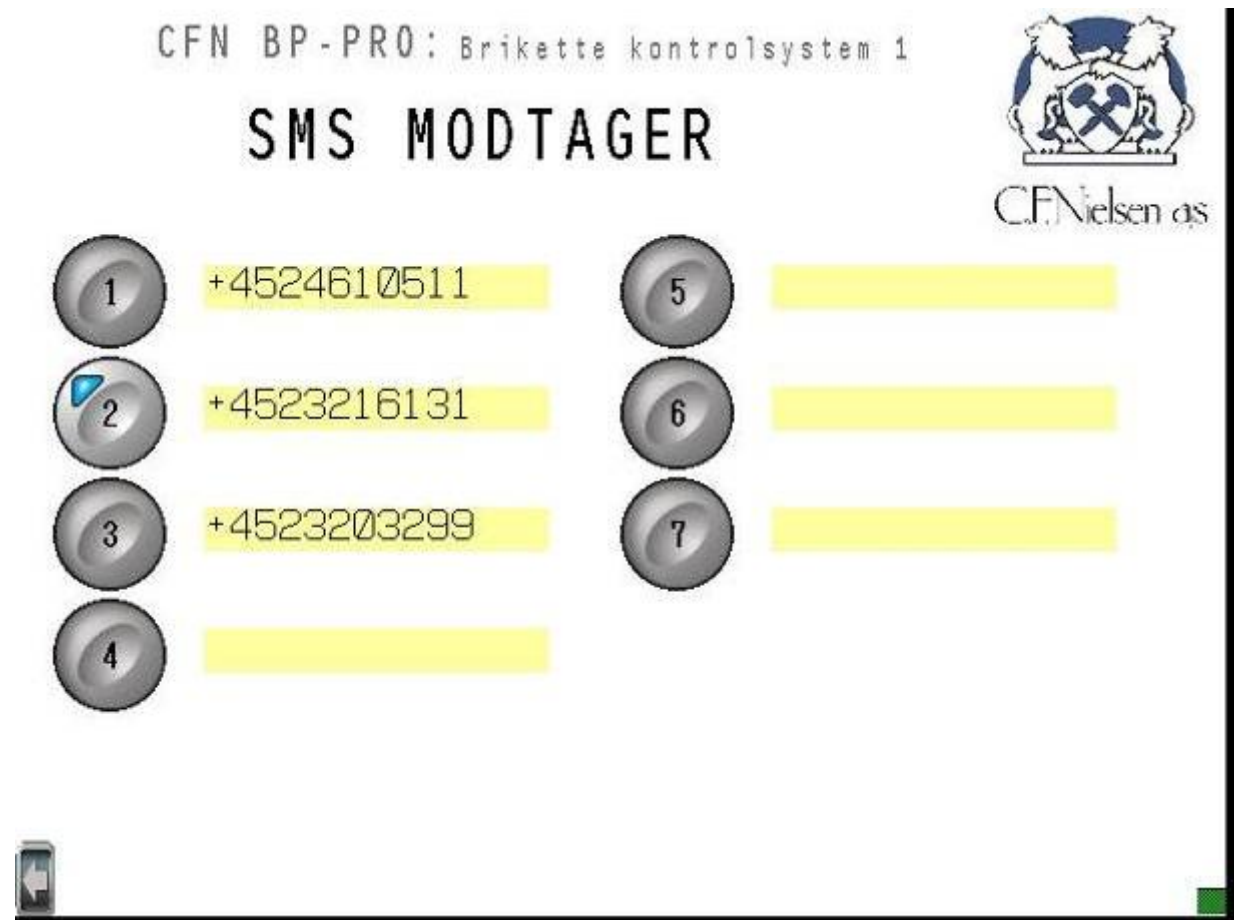




# ABCS - Advanced Briquetting Control System



Text  
Message  
System





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## ABCS - Advanced Briquetting Control System

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- **Quantity regulation:** We want a constant amount of briquettes. Fx. 1.200 kg/hour. We have placed a cogwheel connected to an encoder on the cooling line. By reading this signal we are regulating the frequency encoder on the dosing screw up and down to maintain a constant quantity due to a PI regulation. This option is normally chosen in connection with the saw or breaker. The regulation can compensate for variation in the density of the raw material and/or particle size.
- **Capacity regulation:** We are measuring the power consumption of the compressions screws. By typing in a max. load on the screw the system will regulate the dosing screw so that we over time will get maximum output from the briquetting press. This regulation is normally for industrial briquettes.
- With the touch screen it is possible to change between the two regulation options with a press on a button if all hardware is installed.





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# ABCS - Advanced Briquetting Control System

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- **Lubrication/service function.** The system gives a warning before service becomes necessary. When the hour counter reaches 900 hours it will change to yellow and when it hits 1000 hours it will change to red. (Hours can be setup on expert level). It is also possible to send SMS message to CFN for service automatically.
- **Trip function.** How many kg produced during certain amount of time. Fx. measure how many kg produces for the last 2 hours, days etc.
- It is very easy to implement new features. We are constantly developing and offering new features. A lot of these features are built in software and therefore the system can easily be upgraded.
- The system can be monitored, operated and upgraded through local network and/or the internet from a standard computer. (Operation system Win2K, WinXP, WinVista ect). It means that the manager can sit with a computer connected to the network and monitor the briquetting plant including dosing system, press and saw etc. It is also possible to operate the machine this way. All functions can be remote controlled.
- If all briquetting features are implemented, the touch screen with Advanced Briquetting Control System is giving you the best value for money.
- **Ask for a real time online demonstration!!**

# Straw – a non fossil Bio Fuel

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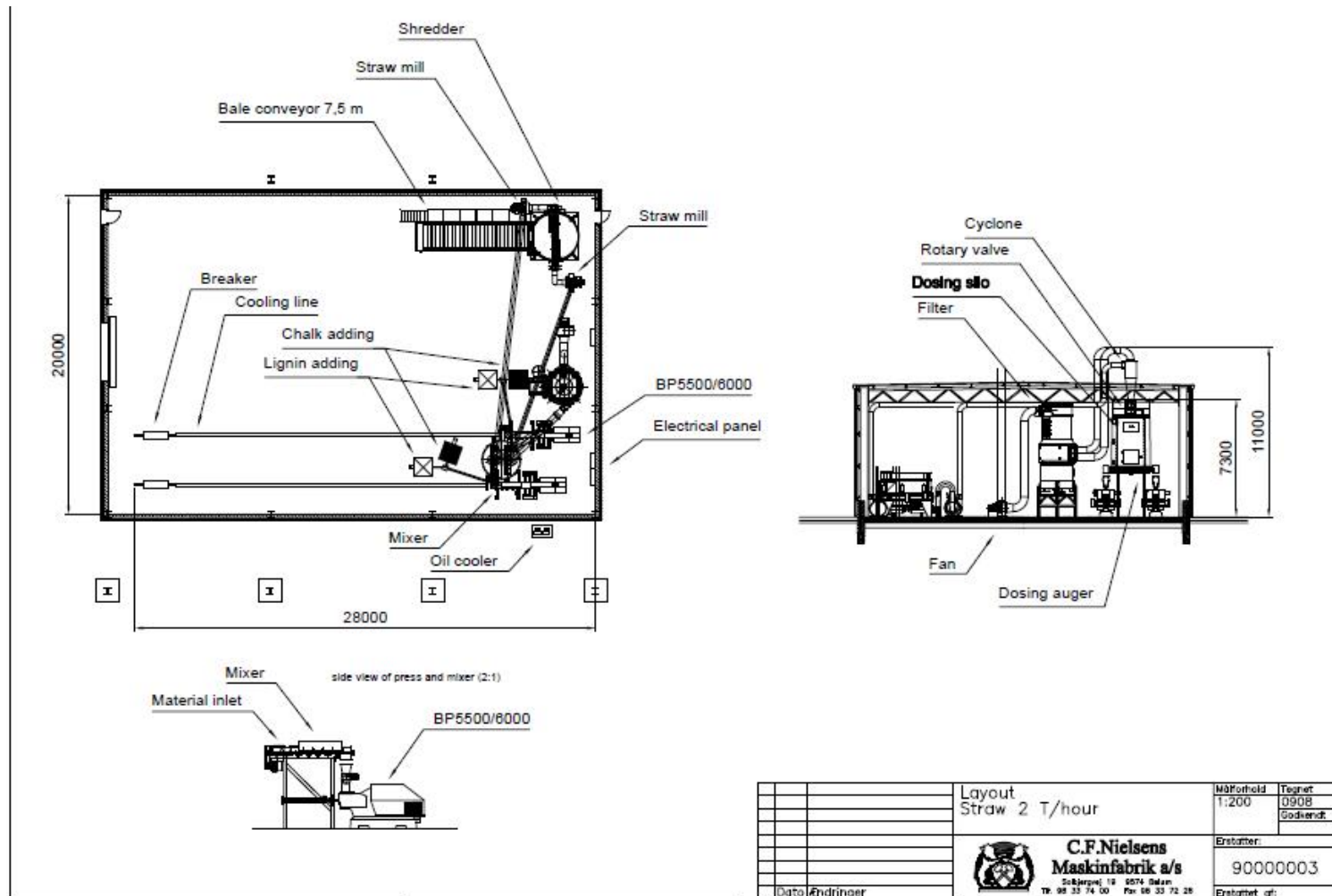


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# Straw Briquetting



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**C.F.Nielsens**  
**Maskinfabrik a/s**  
Søndervej 18 8874 Salum  
Tlf. 98 33 74 00 Fax 98 33 72 28

# Straw Briquetting

Briquetting of wheat straw  
Is gaining popularity due to  
the lack of dry woodwaste.



# Straw Briquetting Plant



- Bale inlet band
- Shredder and hammermill
- Stone trap is very important to reduce wear on vital parts of briquetting press





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# 4 x BP 6000 HD Presses in ACTION

Briquettes  
From  
Wheat  
straw



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## BP5500HD – ideal for straw briquetting



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# Spares + Service cost for CFN presses



<b>The list figures are intended as guideline only, as a lot depends of the overall nature of the raw material</b>			
<b>Application</b>	<b>Press Type</b>	<b>Parts + Service EUR/Ton</b>	<b>Parts + service EUR/hour</b>
<b>Industrial briquettes</b>	<b>BP 5500</b>	<b>1.70</b>	<b>2.70</b>
<b>Consumer briquettes round</b>	<b>BP 6000</b>	<b>2.90</b>	<b>3.40</b>
<b>Consumer briquettes – round with centric hole</b>	<b>BP 6000</b>	<b>4.00</b>	<b>5.00</b>
<b>Consumer briquettes – square</b>	<b>BP 6000</b>	<b>6.00 Estimate only</b>	<b>7.00 Estimate only</b>

## Recommended service intervals:

- For all machines – every 1000 hours
- For some industrial machines every 1500 hours based on agreement on a case to case basis
- All machines for square briquettes, briquettes with a hole and all BP6000 "must" be serviced every 1000 hours



# Customers for Briquetting Plants

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- Woodworking plants
- Sawmills (only with dry sawdust etc.)
- Furniture & cabinetmakers etc
- Windows- and door producers
- Agricultural companies
- Demolition companies
- Tobacco producers
- Etc.



# Customers for Briquettes

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- Heating Plants Bulk briquettes
- Power Plants -
- Swimming Pools -
- Hospitals -
- Production companies -
  - process heat
  - heating
- Private Consumers
  - Sold at gas stations and shops for building material for the DIY customers



C.F. Nielsen

# It's a Money Machine...



65 Years of Briquetting Experience



# Thank you for your attention!

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Thank you for your interest in our company and our products

Further information is available on our website

[www.cfnielsen.com](http://www.cfnielsen.com)

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