

IPHA PRODUCTION SEMINAR 2016

October 26–27. Lleida · Mollerussa, Catalonia

Extruder Technology

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Company: NORDIMPIANTI, Italy



INTERNATIONAL PRESTRESSED
HOLLOWCORE ASSOCIATION

in cooperation with

Pujol



Topics:

- **Nordimpianti Casting Machines:**
 - Extruder Machine
 - Background of Extruder technology
 - Present Day
 - Advantages from Extruder technology
 - Slipformer Machine
 - Special slipformer machine
 - Wet Casting Machine
- **Conclusion**

Nordimpianti Casting machines



Extruder

Slipformer

Wet casting

Extruder Machine



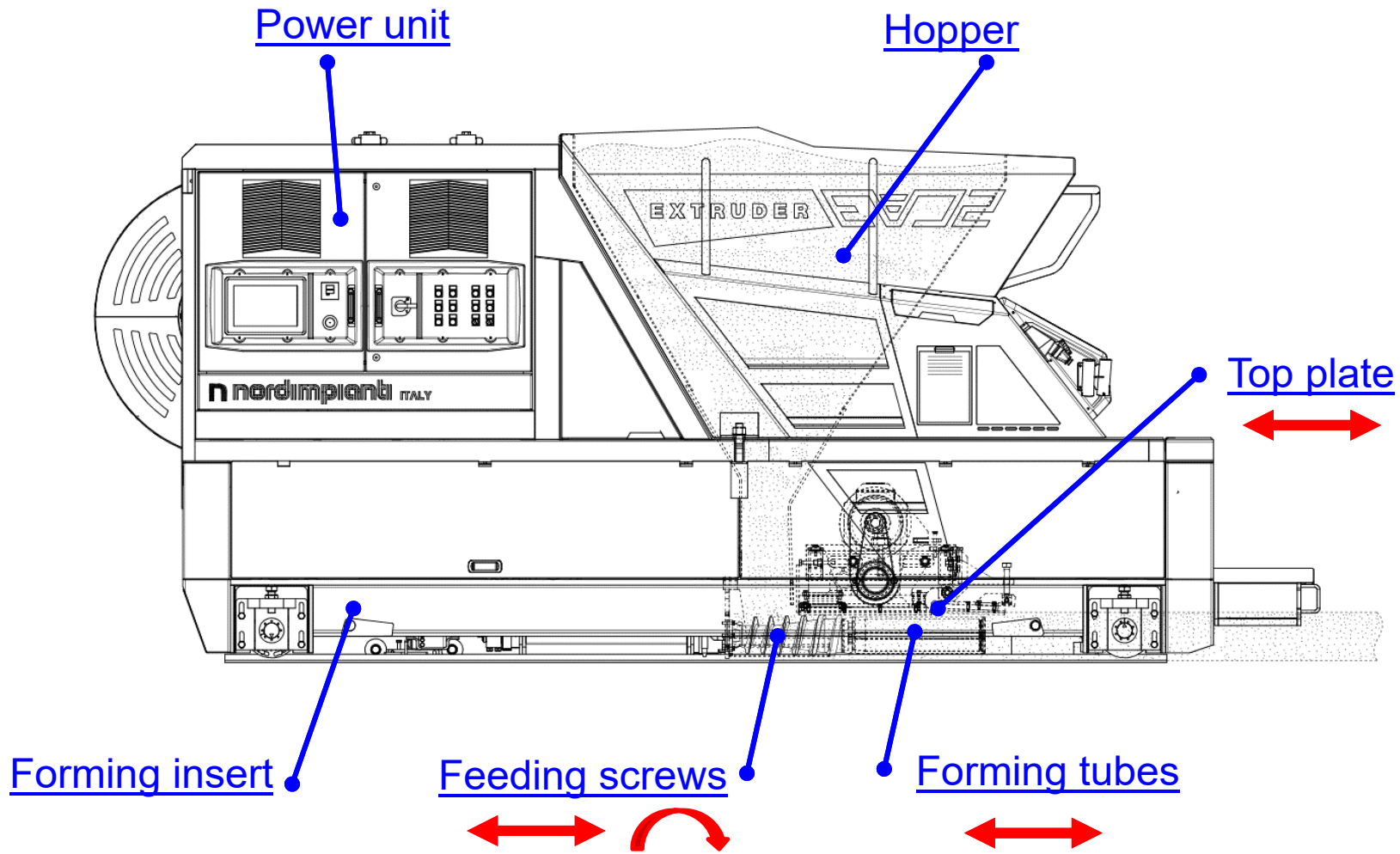
The Extrusion process with the latest extruder machine

The concrete is forced and compacted into its profile by special screw feeders in a single stage to produce the finished slab section

Background of Extruder technology

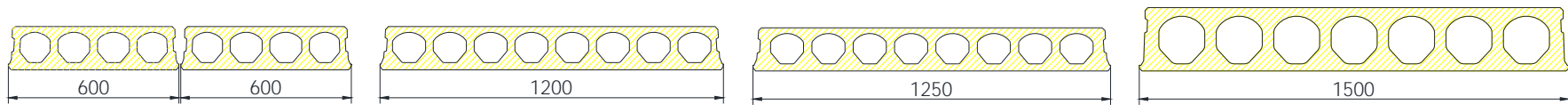
- Extruder technology started in North America in the 1960's;
- Extrusion procedure uses concrete with low water/cement ratio, compared with other conventional precast systems;
- At that time only round core sections were possible as soon as the forming tubes were directly connected to the screws;
- Screws and tubes were not independent and there were vibrators inside the forming tubes;
- Most development took place in Northern Europe and the former Soviet union;
- Nordimpianti's Extruder is now in its 4th generation development of extruder procedure and machines.

Present Day



Advantages from Extruder technology

Flexibility of use in obtaining a wide range of products



2x600mm wide

H= 150-180-200mm

1200mm wide

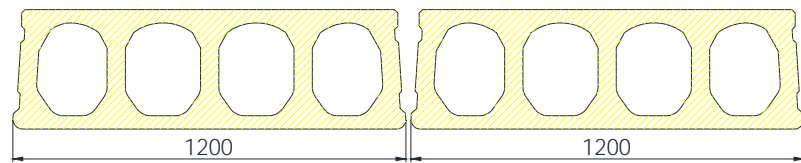
H= 150-200-265
320-400-500mm

1250mm wide

H= 150-200-265
320-400-500mm

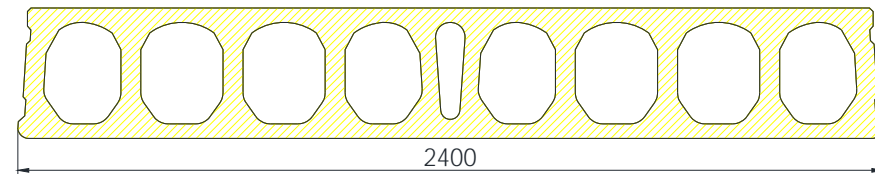
1500mm wide

H= 220mm



2x1200mm wide

H= 150-200-265
320-400-500mm



2400mm wide

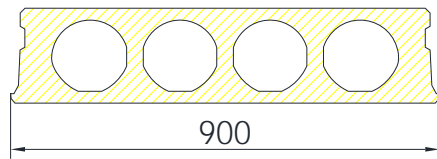
H= 200-265
320-400-500mm



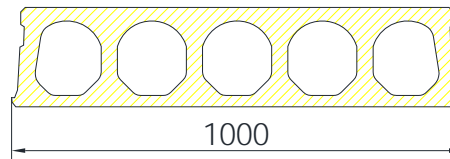
Advantages from Extruder technology

Flexibility of use in obtaining a wide range of products

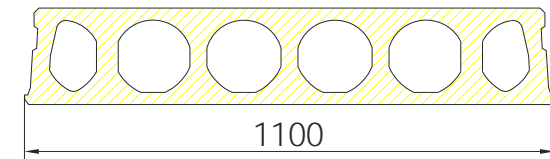
SPECIAL WIDTHS



900mm wide



1000mm wide



1100mm wide



Advantages from Extruder technology

Flexibility of use in obtaining a wide range of products



Advantages from Extruder technology

- **Excellent surface finish**
- **Compliance to designed cross section geometry**
- **Accurate and consistent positioning of strands**



Advantages from Extruder technology



High concrete compaction



**Able to produce slender
precast slabs**

Void/gross area ratio can
reach 55%

Advantages from Extruder technology



Low cement dosage

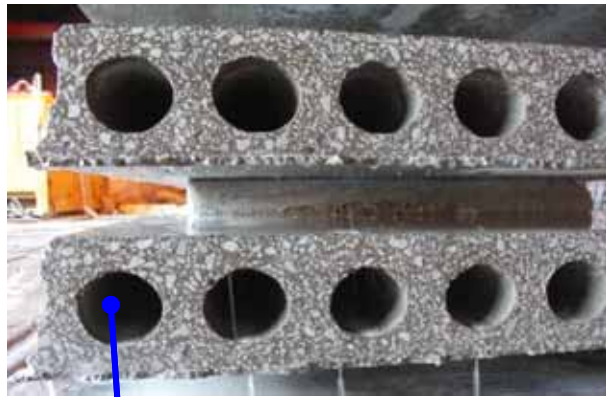
320-360 kg/m³



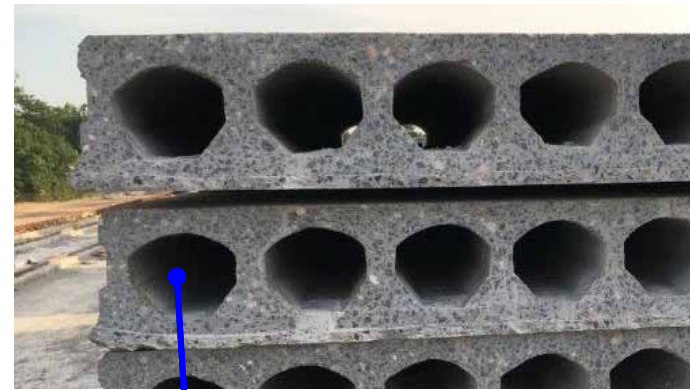
User friendly machine

Advantages from Extruder technology

Able to produce slabs with round or contoured cores



Circular cores



Contoured cores



Advantages from Extruder technology

4) Improved user friendly machine operation:

- A) Production schedule support;
- B) Tool holder compartment;
- C) Place for lifting hooks



A)



B)



C)

Advantages from Extruder technology

Ability to produce slabs complying with seismic parameters for Earthquake Engineering.



Corrugate surface

Other casting machine technologies ...

Extruder technology is not the only one available to produce hollow core slabs.

Slipformer

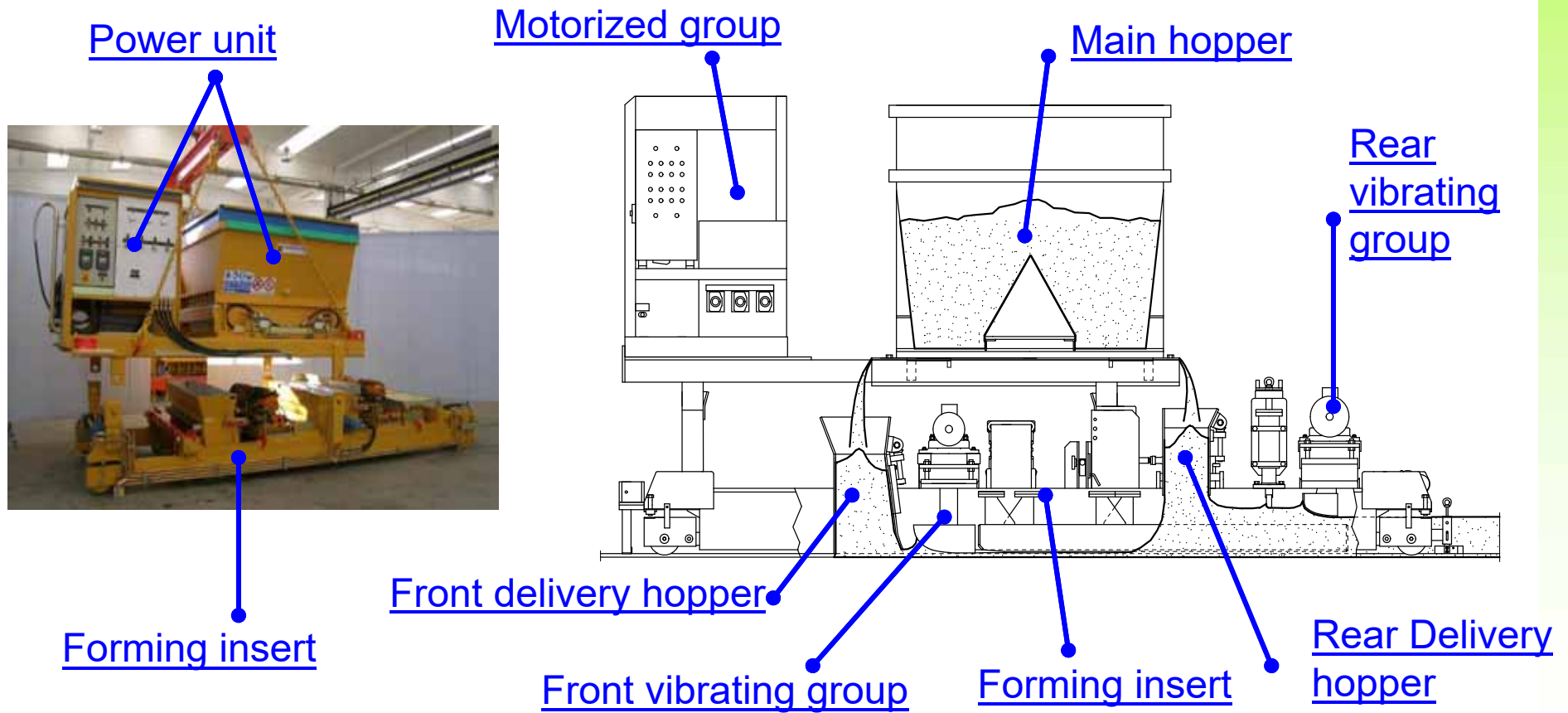


Wet Casting



Slipformer machine

The Nordimpianti Slipformer consists of two main units:
a universal **power unit** and an element-specific **forming insert**



Slipformer technology

PROS

- ✓ Flexibility to produce a variety of cross sections;
- ✓ Ability to use normal reinforcement in addition to the prestressing wires;
- ✓ Cross section 500 mm high up to 1000 mm high;
- ✓ Low water/cement ratio;
- ✓ Low cement dosage.

CONS

- ✓ Skill of operator;
- ✓ Self weight of precast element.

Special Slipformer machine



UP TO 1m HIGH!!!

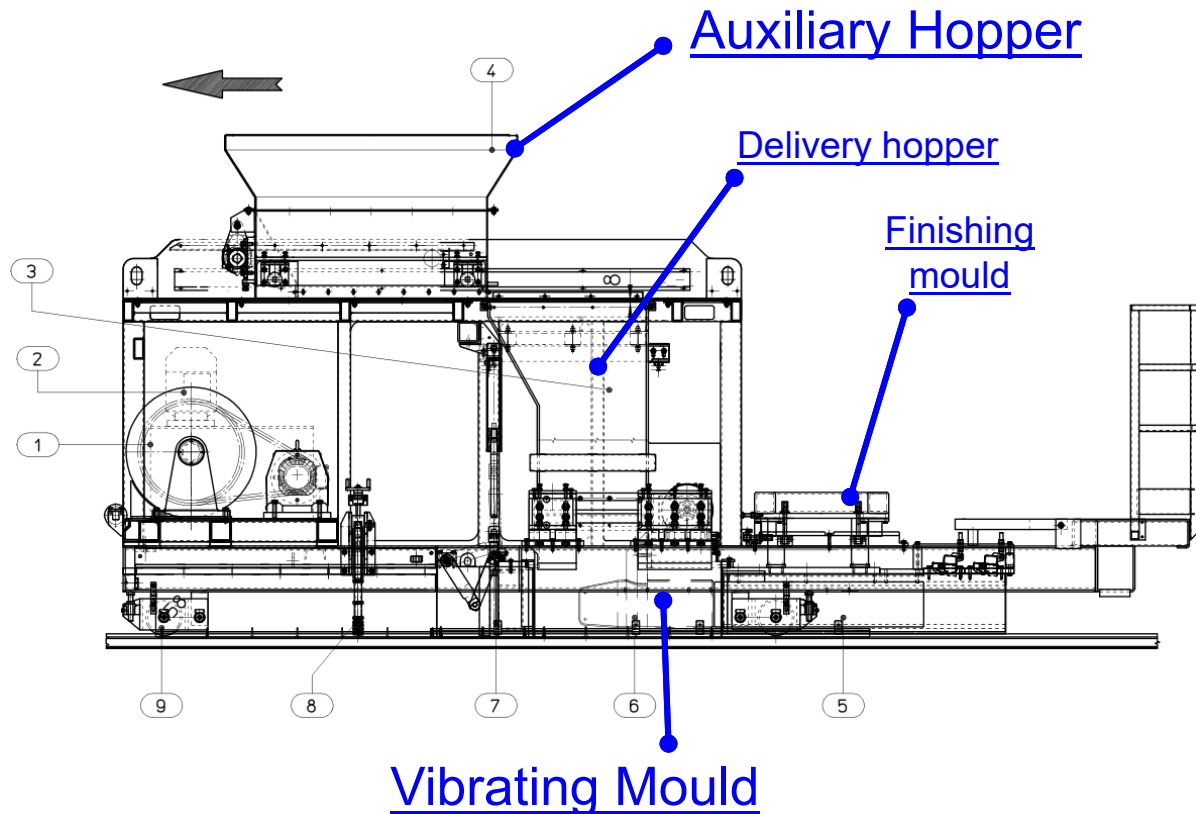
Wet casting machine

The Nordimpianti Wet casting machine consists of two main units: the **Wet Casting Machine** and an interchangeable **finishing mould**:

Wet Casting Machine



Finishing Mould



Wet casting technology

PROS

- ✓ Casting speed;
- ✓ Flexibility to produce a variety of cross sections;
- ✓ High quality of surface finish;
- ✓ Low maintenance costs;
- ✓ Fast change of product type;
- ✓ Low initial budget outlay.

CONS

- ✓ High cement dosage;
- ✓ High water/cement ratio;
- ✓ Wastage of material at production bed ends;
- ✓ Geometrical limits of core shapes;
- ✓ Long curing time.

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THANK YOU FOR YOUR ATTENTION!



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