



# VIBROFLOT PRODUCT RANGE

**DIESEKO GROUP**

**ICE**  
INTERNATIONAL CONSTRUCTION EQUIPMENT

## AN INTRODUCTION TO **DIESEKO GROUP** FOUNDATION EQUIPMENT

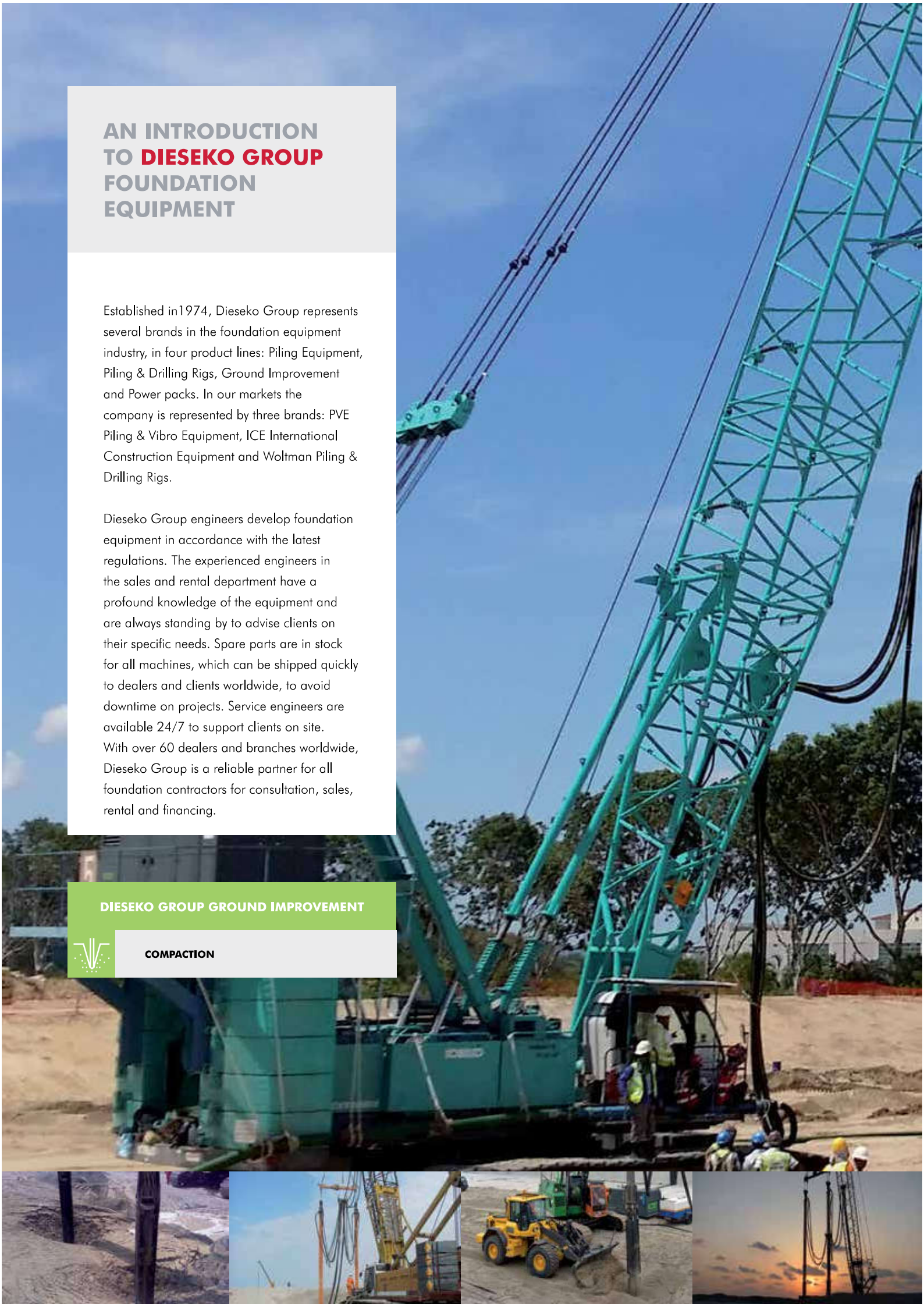
Established in 1974, Dieseko Group represents several brands in the foundation equipment industry, in four product lines: Piling Equipment, Piling & Drilling Rigs, Ground Improvement and Power packs. In our markets the company is represented by three brands: PVE Piling & Vibro Equipment, ICE International Construction Equipment and Woltman Piling & Drilling Rigs.

Dieseko Group engineers develop foundation equipment in accordance with the latest regulations. The experienced engineers in the sales and rental department have a profound knowledge of the equipment and are always standing by to advise clients on their specific needs. Spare parts are in stock for all machines, which can be shipped quickly to dealers and clients worldwide, to avoid downtime on projects. Service engineers are available 24/7 to support clients on site. With over 60 dealers and branches worldwide, Dieseko Group is a reliable partner for all foundation contractors for consultation, sales, rental and financing.

### DIESEKO GROUP GROUND IMPROVEMENT



#### COMPACTION



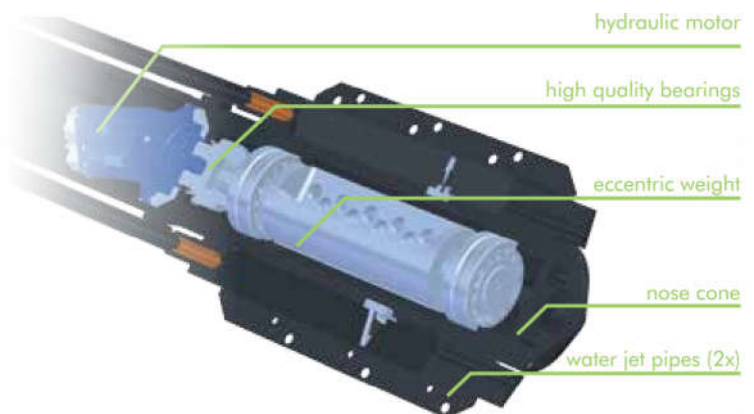




# DEEP VIBRATION TECHNIQUES

ICE International Construction Equipment is part of the Dieseko Group, specialized in engineering, manufacturing, rental and sales of piling and vibro equipment and power packs. ICE has become the largest manufacturer of piling equipment, thanks to its ongoing efforts in optimizing quality and performance. With a worldwide distribution and service network ICE has an outstanding service performance. We know that when a foundation is solid, you can build on it.

The ICE Vibroflots are specifically designed for most challenging circumstances all over the world. The modular construction is a typical characteristic of the ICE Vibroflot series V180 and V230. The machines are built according to the latest industry and environmental standards. The equipment is easy to use, reliable and durable with its state of art hydraulic powering.



**“With our own product development department  
we can go ahead with innovations  
nobody else would even try”**

# VIBROFLOTATION

## THE PRINCIPLE

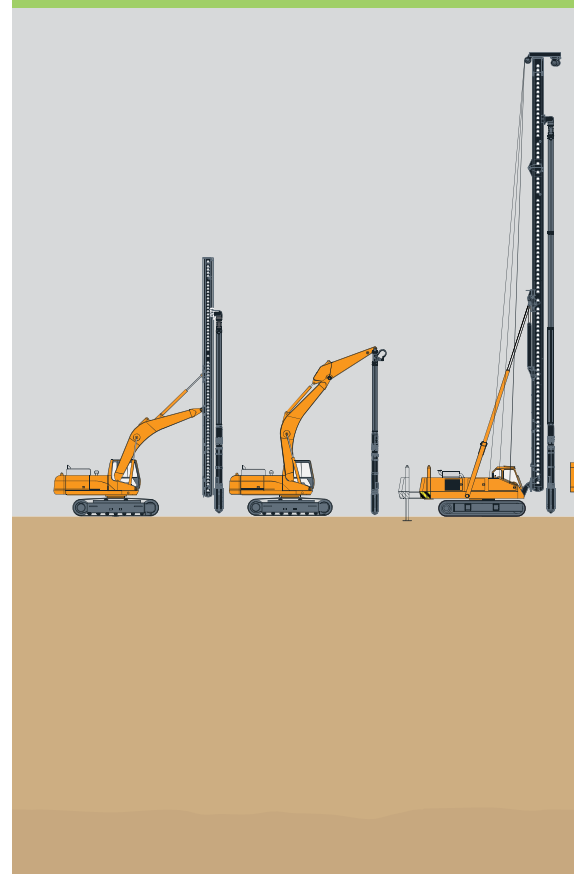
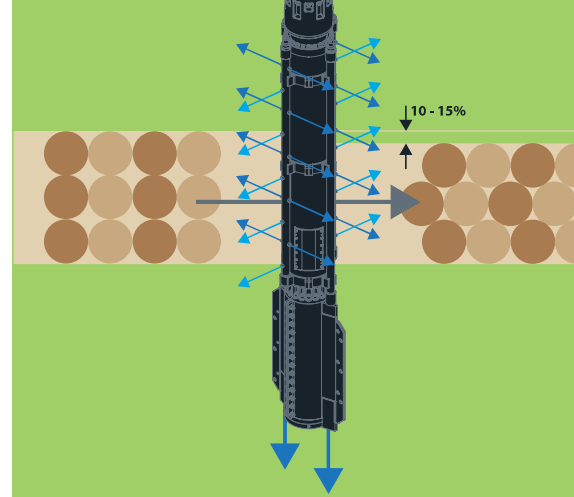
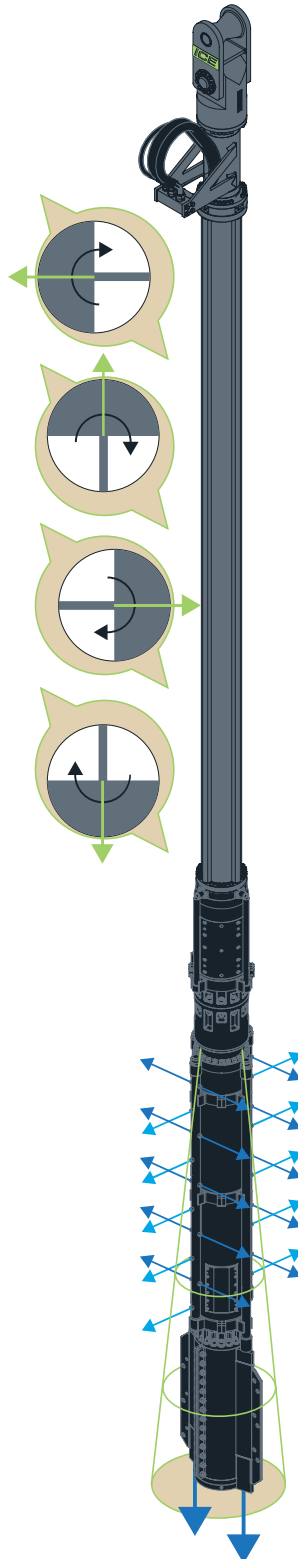
Under the influence of the induced vibration, the soil particles are rearranged and compacted. The vibrating and oscillating movement of the Vibroflot is generated by the hydraulic powered eccentric weight. At full water pressure the oscillating vibrator penetrates to the design depth and is surged up and down to agitate the soil. At full depth the water flow is reduced or stopped. The volume reduction of the compacted soil can reach compaction values up to 15%.

Vibroflotation, also known as vibro compaction was developed in the 1930's. The process involves the use of our down-hole vibrator (Vibroflot), which is lowered into the ground to compact the soils at depth. The method is used to increase bearing capacity, reduce foundation settlements, reduce seismic subsidence and liquefaction potential, and permit construction on loose granular fills.

Our Vibroflots can be used for the most common techniques of ground improvement:

**Vibro compaction:** compacting coarse grain soil (sand) structures.

**Vibro replacement:** when the soil is too fine, or too silty, reinforcing elements are included with the wet top feed or dry bottom feed method.



# VIBROFLOTATION COMPACTION

The vibrator is suspended from a standard crawler crane and is lowered into the ground, assisted by its weight, vibration, and typically water jets in its tip.

The compaction starts at the bottom of the treatment depth. The vibrator is then either raised at a certain rate or repeatedly raised and lowered as it is extracted. Rearranging the surrounding granular soils into a denser configuration, can achieve relative densities of 70 to 85%. Treatment as deep as 40m has been achieved. Sand is added around the vibrator at the ground surface and lowers around the vibrator to its tip to compensate the volume reduction during densification. If no sand is added, the in situ sands will cave in, resulting in a decline in the ground surface. Loose sand will experience a 10 to 15% volume reduction during densification. Coarser backfill, up to gravel size, improves the effectiveness of the technique, especially in silty soils.

## Compaction configuration



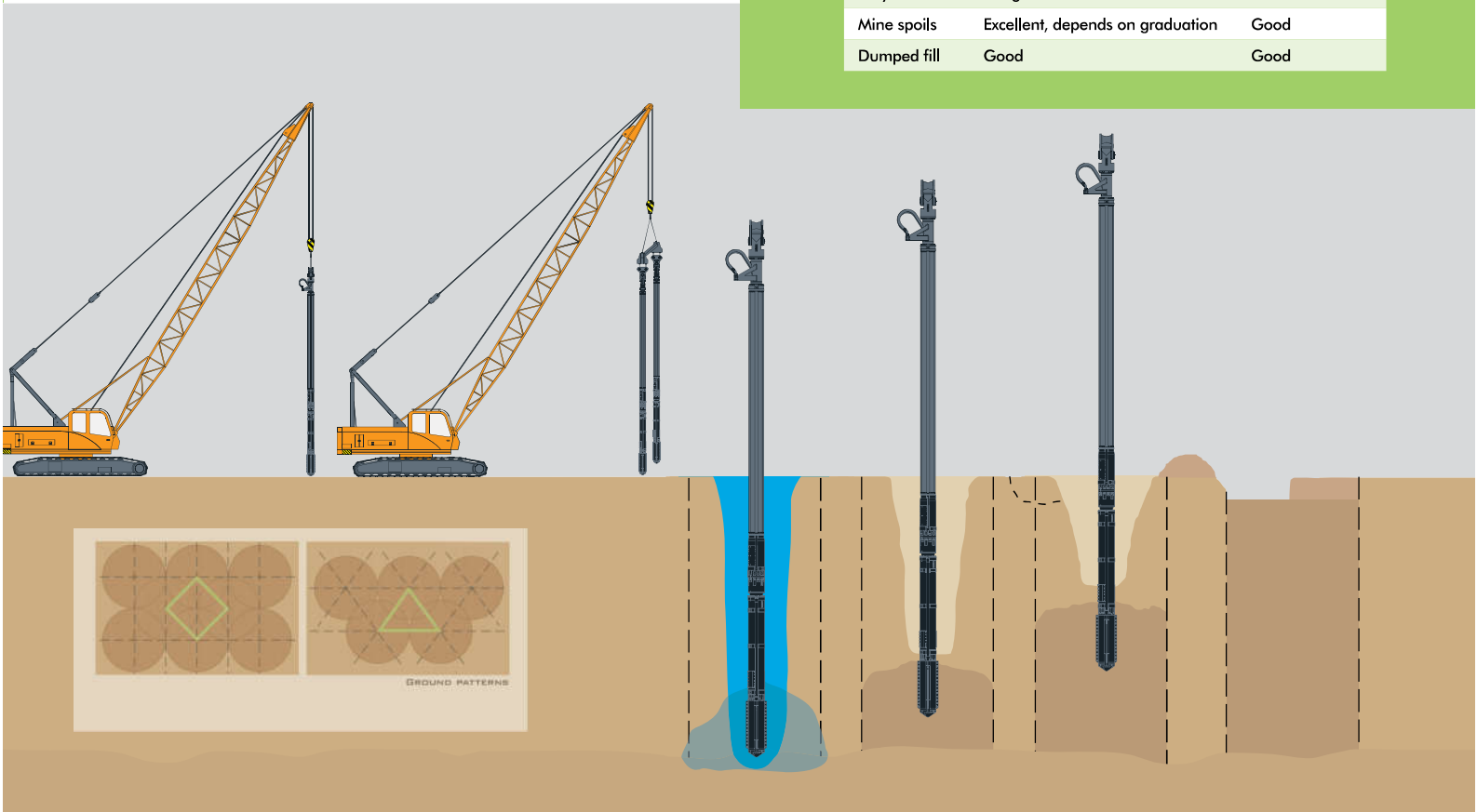
- Main Parts**
- A Vibroflot
  - B Wear mantle
  - C Water pipe incl. side water jets
  - F Follower tube(s)
  - I Hose guide
  - H Lifting head

## VIBRO COMPACTION RESULTS

Ground type	Relative effectiveness
Sands	Excellent
Silty sands	Marginal to good
Silts	Poor
Clays	Not applicable
Mine spoils	Good (if clean granular)
Dumped fill	Dependent on nature of fill

## VIBRO REPLACEMENT RESULTS

Ground type	Relative effectiveness	
	Densification	Reinforcement
Sands	Excellent	Very good
Silty sands	Very good	Very good
Silts	Good	Excellent
Clays	Marginal	Excellent
Mine spoils	Excellent, depends on graduation	Good
Dumped fill	Good	Good



## VIBROFLOTATION REPLACEMENT

Stone columns refer to columns of compacted, gravel size stone particles to improve the performance of soft or loose soils. The stone particles can be compacted with the ICE Vibroflot. The method is used to increase bearing capacity, reduce foundation settlements, improve slope stability, reduce seismic subsidence, reduce lateral spreading and liquefaction potential, permit construction on loose/soft fills.

Applicable soil types: Stone columns improve the performance of soils in two ways:

**WET TOP FEED** densification and reinforcement of surrounding granular soil;

**DRY BOTTOM FEED** reinforcing the soil with a stiffer higher shear strength column.

### REPLACEMENT WET TOP FEED

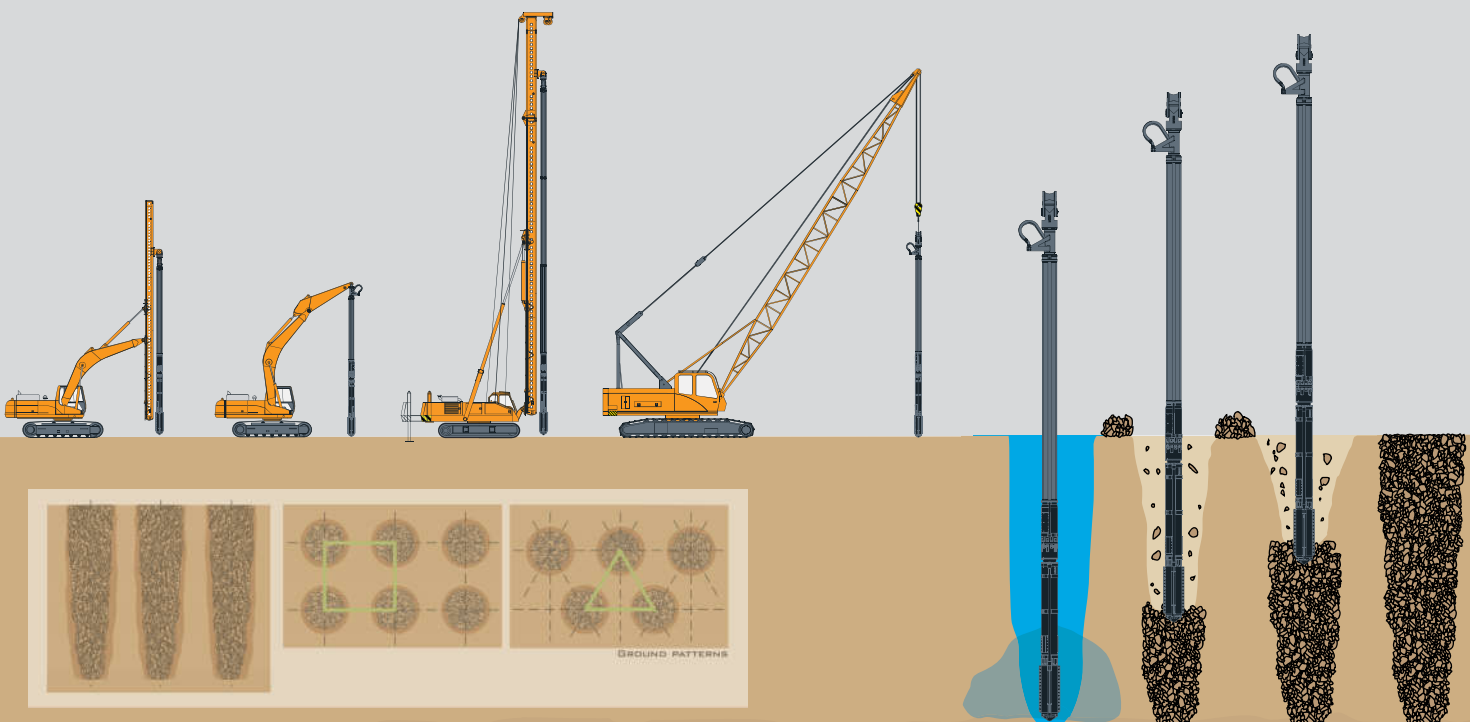
The column construction starts at the bottom of the treatment depth and proceeds to the surface. The vibrator penetrates into the ground, assisted by its weight, vibration, and typically water jets in its tip.

A wheeled loader places stone particles around the Vibroflot at the ground surface and the stones lower to the tip of the Vibroflot through the flushing water around the exterior of the Vibroflot. These can be sand poles, grind poles and mixing with other suitable materials. The vibrator is then raised a couple of decimeters and the stones lower around the Vibroflot to the tip, filling the cavity formed as the Vibroflot is raised.

The Vibroflot is then repeatedly raised and lowered as it is extracted, compacting and displacing the stones.

### REPLACEMENT DRY BOTTOM FEED

In this procedure the stones particles are fed to the tip of the Vibroflot through a material transfer pipe which is fastened to the side of the Vibroflot. A stone hopper is filled with stones on the ground with a wheeled loader and a separate cable lifts the hopper to a material storage container at the top of the transfer pipe. The stone particles are rammed and compacted with the Vibroflot.





## Wet top feed configuration

The wet top feed method requires water/air nozzles. The ICE base Vibroflot can be assembled with these modular parts (see also page 8). ICE engineers will design custom made mounting elements to connect the Vibroflot to your crawler crane, leader crane or excavator.

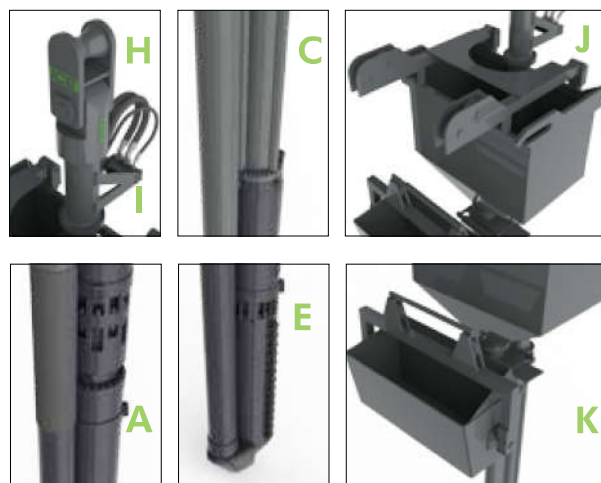


### Main Parts

- |               |                    |
|---------------|--------------------|
| A Vibroflot   | F Follower tube(s) |
| B Wear mantle | I Hose guide       |
| D Water pipe  | H Lifting head     |

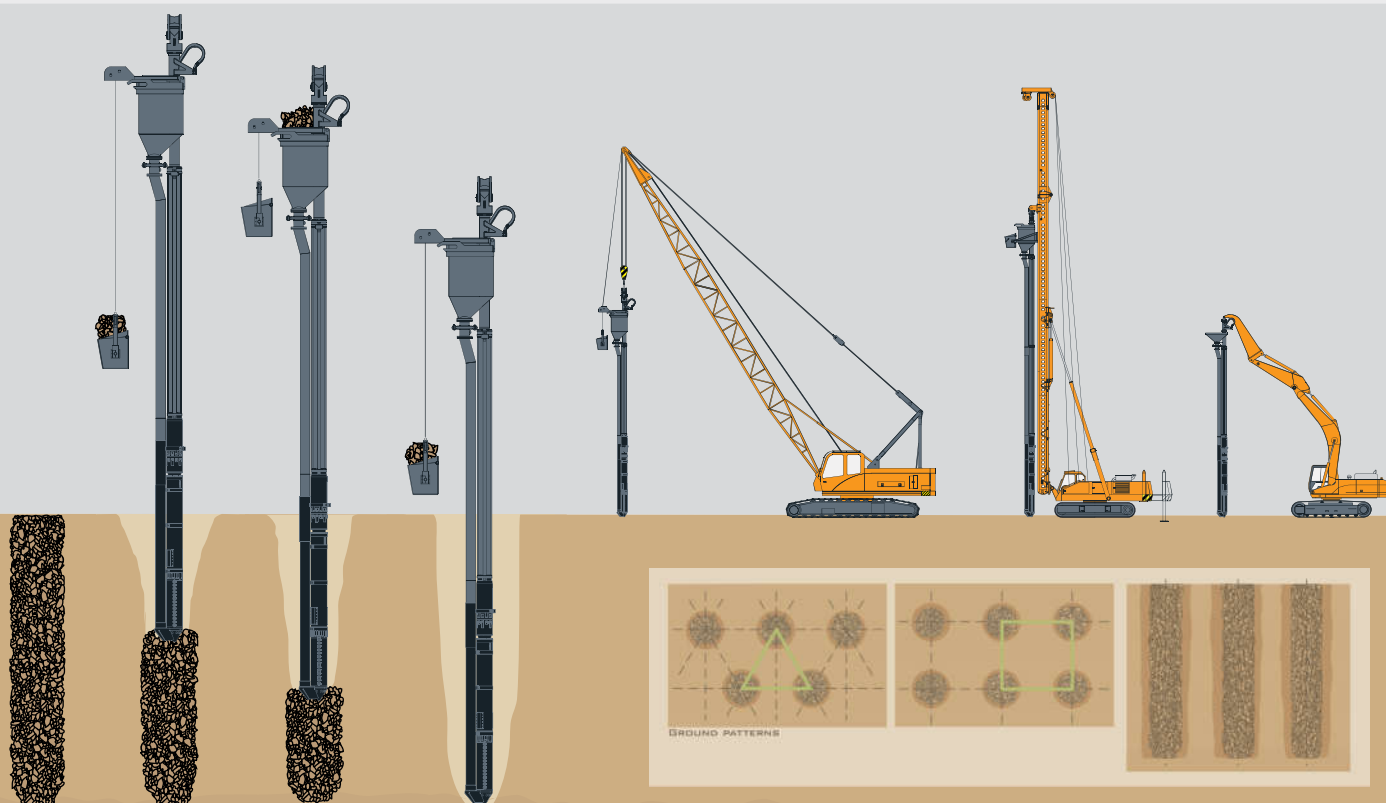
## Dry bottom feed configuration

The dry bottom feed method requires an adapted Vibroflot which can be assembled with the ICE modular parts (see also page 8). The hopper, container, material transfer pipe and the special nose cone all can be assembled to our base Vibroflot. ICE engineers will design custom made mounting elements to connect the Vibroflot to your crawler crane, leader crane or excavator.



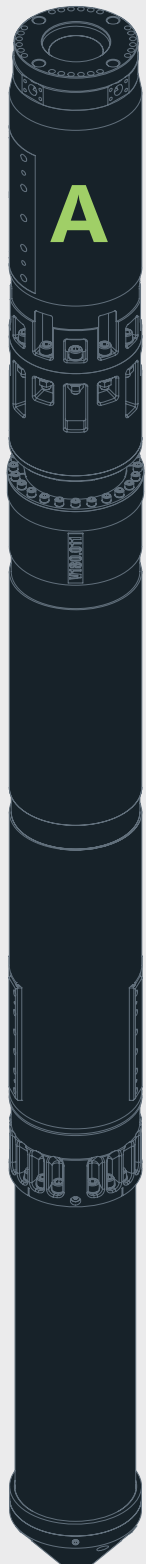
### Main Parts

- |                                    |                     |
|------------------------------------|---------------------|
| A Vibroflot                        | I Hose guide        |
| C Follower tube with transfer pipe | J Storage container |
| E Wear mantle with transfer pipe   | K Material hopper   |
| H Lifting head                     |                     |



# MODULAR DESIGN

This overview shows the modular elements of the Vibroflot V180/V230 series. For typical vibroflotation or reinforcement usage, different elements are available. The heart of the system is a V180 or V230 Vibroflot with eccentric weight and hydraulic motor. To enlarge the applications we offer a unique modular system, with components which are quickly and easily assembled or disassembled. That's smart thinking!



## VIBRO COMPACTION & WET TOP FEED REPLACEMENT



Configuration for leader



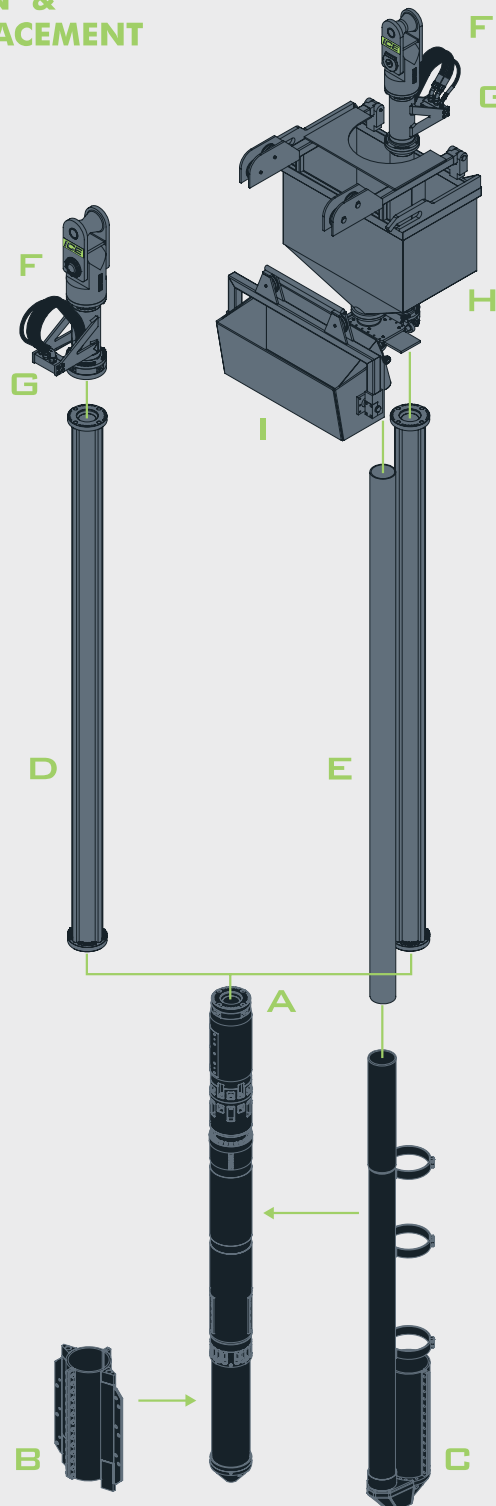
Configuration for excavator



Configuration for tandem



Spreader bar for tandem



## DRY BOTTOM FEED REPLACEMENT



Configuration for leader



Configuration for excavator

- A Vibroflot
- B Wear mantel
- C Wear mantel with material transfer pipe
- D Follower tube(s)
- E Follower tube(s) with material transfer pipe
- F Lifting head free hanging
- Fe Lifting head excavator mounted
- Fi Lifting head leader guided
- Ft Lifting head tandem solution
- G Hose guide
- H Material storage container
- He Storage container for excavator
- Hi Storage container for leader
- I Material transfer hopper free hanging
- Ii Transfer hopper for leader
- Jt Spreader bar tandem solution



# YOUR BENEFITS

## ICE MODULAR THINKING

Our smart solution for different soil improvement techniques is a modular system of Vibroflot components. The heart of the system is a V180 or V230 Vibroflot with eccentric weight and hydraulic motor.

Other function related components can be fastened to this base. Follower tubes are designed with integrated air-water transit for a smooth surface and easy penetrating. Even hopper and container are easy to assemble or disassemble.

### Our new design benefits:

- Reduction of construction time on site
- Multi-purpose base: for compaction AND replacement methods
- Easy replacement and service
- Excellent hose protection
- Easy penetration

## ICE BUILDING QUALITY

Vibroflots are superior in building quality and design.

- Superior materials and components
- High tech precision engineering
- Over 20 years in-house experience in engineering, design and production
- Proven reliability
- Worldwide service through dealer network
- Easy and fast spare part services

## ICE HYDRAULIC RELIABILITY

ICE is specialized in hydraulic equipment. No heating problems, no megger testing, no high voltage danger. These are the main advantages of hydraulic powering compared to electric powering. Reliable hydraulic powering is our core business since 1974. Then and nowadays we are convinced that hydraulic power has the future and many satisfied customers trust our vision. In equipment and power packs ICE goes beyond the latest international emission standards with Tier4 engines.



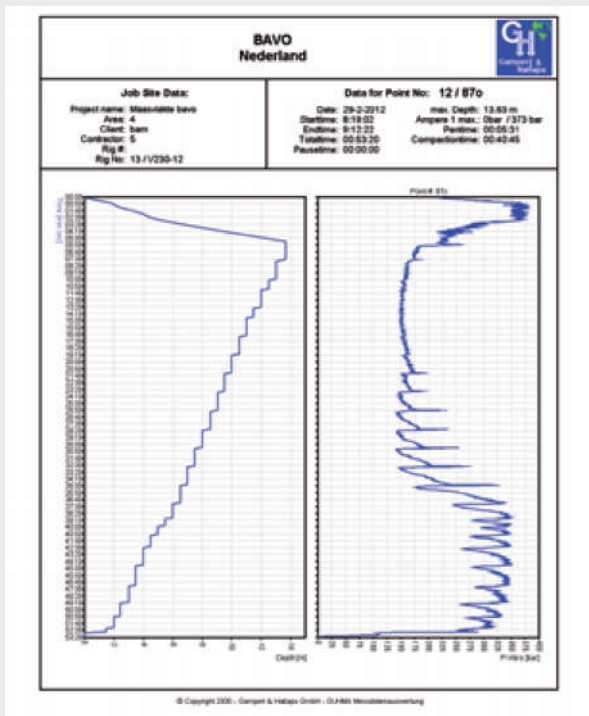
# REAL TIME MONITORING SYSTEM

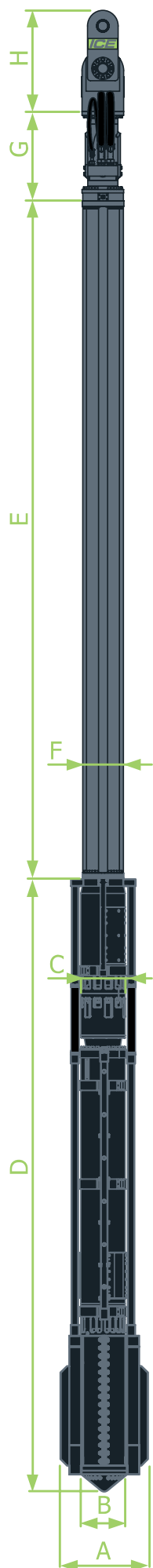
For a constant high quality of workmanship, electronic measuring devices can be used to monitor and record the activities.

With the ICE real time monitoring system (optional) the operator is able to control the complete process from the cabin. To control the process, the relevant construction parameters can be measured, saved and printed as proof of production and quantities.

The recorded data will include:

- Date, point of references, start, finish & overall time, penetration depth, obstruction depths etc. These values can be graphically displayed and printed.
- Many different reports can be generated by the site engineer.
- All safety and technical parameters are stored automatically. Download data at any time to support service intervals.

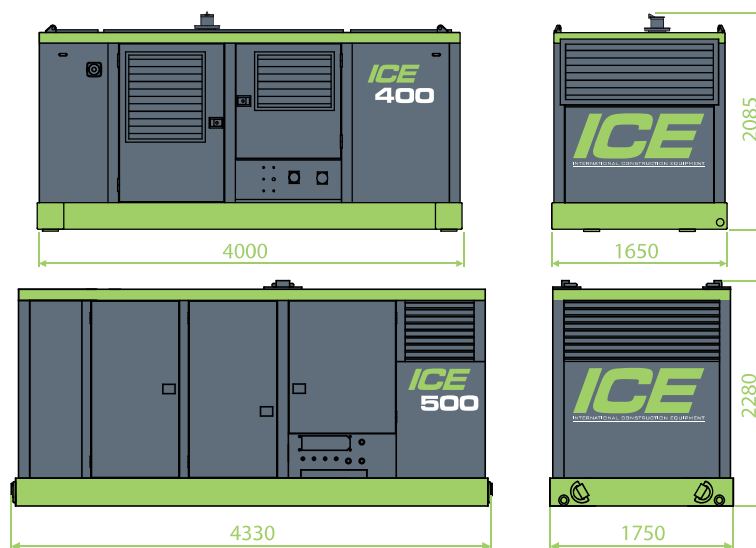




## TECHNICAL DATA VIBROFLOTS

### TECHNICAL DATA VIBROFLOT

		V180	V230
Eccentric moment	kgm	5.5	11
Rotation speed	rpm	1800	1800
Centrifugal force	kN	195	388
Amplitude (at Tip)	mm	20	24
Line pull	kN	500	500
Hydraulic flow	l/min	450	450
Max. hydraulic pressure	bar	350	350
<b>Weights</b>			
Weight Vibroflot	kg	2590	3260
Weight follower tube	kg	1900	1900
Weight lifting head	kg	405	405
Weight hose guide	kg	240	240
<b>Sizes</b>			
Width A	mm	744	806
Diameter B	mm	358	420
Diameter C	mm	360	360
Length Vibroflot (D)	mm	4969	5166
Length follower tube (E)	mm	5500	5500
Diam. follower tube (F)	mm	330	330
Length hose guide (G)	mm	720	720
Length lifting head (H)	mm	820	820
Min. total length (D+G+H)	mm	6513	6710



### TECHNICAL DATA POWER PACK

		ICE 400 Series	ICE 500 Series
Engine		Caterpillar C9	Volvo TAD 1352 GE
Rated output	kW/HP	242/329	363/494
Maximum frequency	rpm	2200	1800
Hydraulic flow	l/min	396	500
Max. hydraulic pressure	bar	350	350
<b>Weights</b>			
Weight Power Pack	kg	6000	6800
<b>Sizes</b>			
Outside dimensions	mm	400 x 1650 x 2085	4330 x 1750 x 2280





## GLOBAL SERVICE NETWORK

### **Dieseko Group B.V.**

(headquarters)  
Lelystraat 49  
3364 AH Sliedrecht, the Netherlands  
Tel: (+31) 184 410 333  
info@diesekogroup.com  
www.diesekogroup.com

### **Woltman Piling & Drilling Rigs**

(service & manufacturing)  
Ambachtsweg 16  
3381 LN Giessenburg, the Netherlands  
Tel: (+31) 184-652044  
info@woltmanrigs.com  
www.woltmanrigs.com

### **Woltman Piling & Drilling Rigs**

(sales & manufacturing)  
Everdenberg 17  
4902 TT Oosterhout, the Netherlands  
Tel: (+31) 184-430900  
info@woltmanrigs.com  
www.woltmanrigs.com

### **PVE Equipment USA Inc.**

5011 Vernon Road  
Jacksonville, FL 32209, USA  
Tel: (+1) 904 765 66 86  
info@pve-equipment.com  
www.pve-equipment.com

### **ICE-PVE Asia Ltd.**

28 Benoi Road  
Singapore 629899  
Tel: (+65) 689 899 91  
enquiry@ice-pveasia.com  
www.ice-pveasia.com

### **Dieseko Brasil**

Rua Cicero Dantas,  
42 - CEP 06713-230 - Cotia - SP Brasil  
Tel: (+55) 11 996 545 097  
info@diesekogroup.com  
www.diesekogroup.com

### **Shanghai ICE Construction Equipment Trading Company**

No.88, Building 31,  
ChuanSha International Industrial Garden,  
6999 ChuanSha Road, PuDong District,  
201202 Shanghai, P.R. China  
Tel: (+86) 21 3468 8990  
info@icevibro.com  
www.icevibro.com

**Dieseko Group certified dealer:**

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