Neueste Trends im maschinellen Tunnelbau

Swiss Tunnel Congress, Luzern, 16.06.2026

HERRENKNECHT
Tunnelvortriebstechnik

TRENDS UND HERAUSFORDERUNGEN IM MASCHINELLEN TUNNELBAU

Efficiency
Sustainability

Excavation
Management
Circular processes

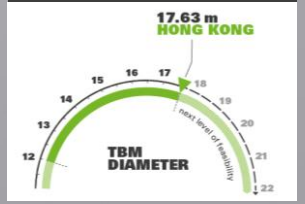
Transparency
Digitization

Hazardous ground
Digitization

Personnel
Automation

Long distances
Automation

Larger diameters



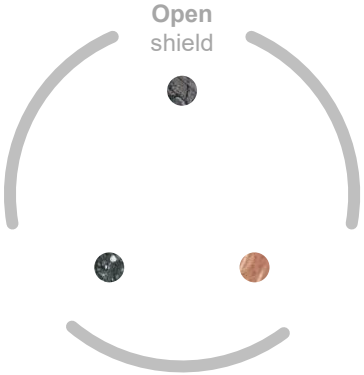
Higher pressures

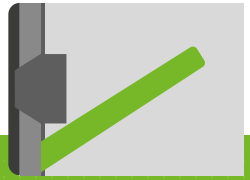
1 MULTI-MODE TBM UND VARIABLE DENSITY TBM

HERRENKNECHT

Spectrum of Herrenknecht

MULTI-MODE TBMS



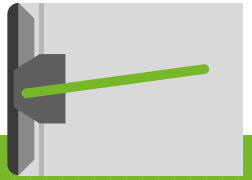


01

Earth Pressure
Balance Shield

02

Mixshield



03

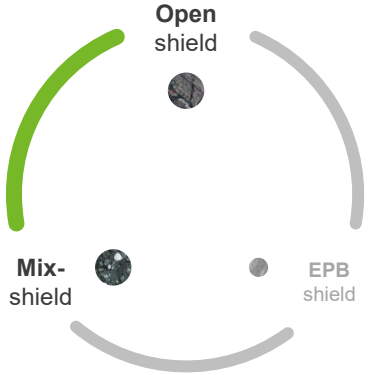
Open shield TBM

(Gripper TBM, Single Shield TBM or Double Shield TBM)

HERRENKNECHT

Spectrum of Herrenknecht

MULTI-MODE TBMS



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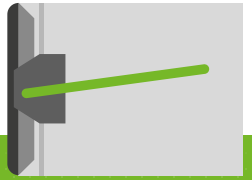

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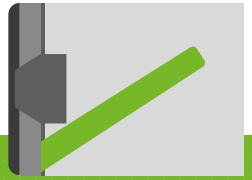

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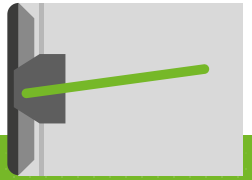

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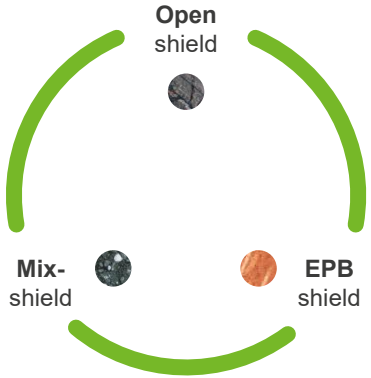

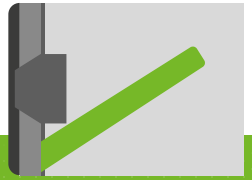

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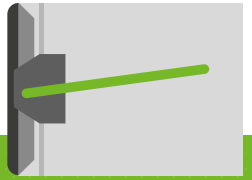

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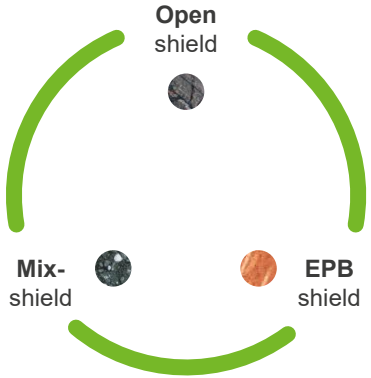
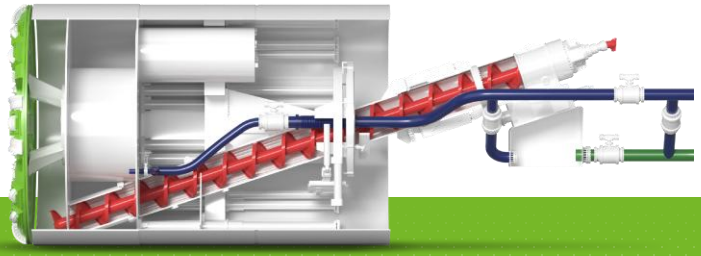
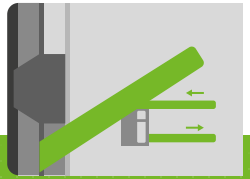






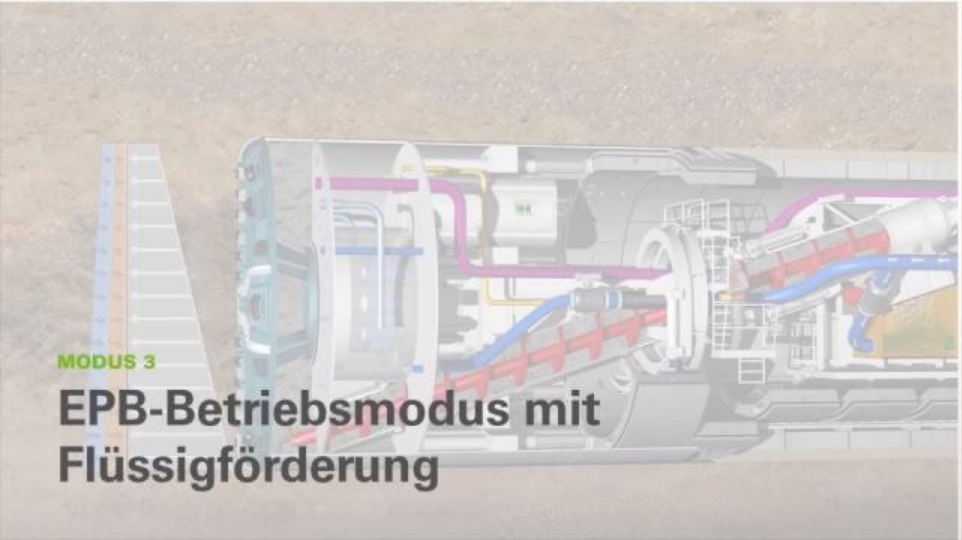
Variable Density TBM

MODUS 1

Flüssigkeitsgestützter Betriebsmodus mit dünnflüssiger Suspension

MODUS 2

Betriebsmodus mit dickflüssiger, dichter Suspension



MODUS 3

EPB-Betriebsmodus mit Flüssigförderung

MODUS 4

EPB-Betriebsmodus mit Trockenförderung

Die weltweit größte TBM mit Variable Density TBM

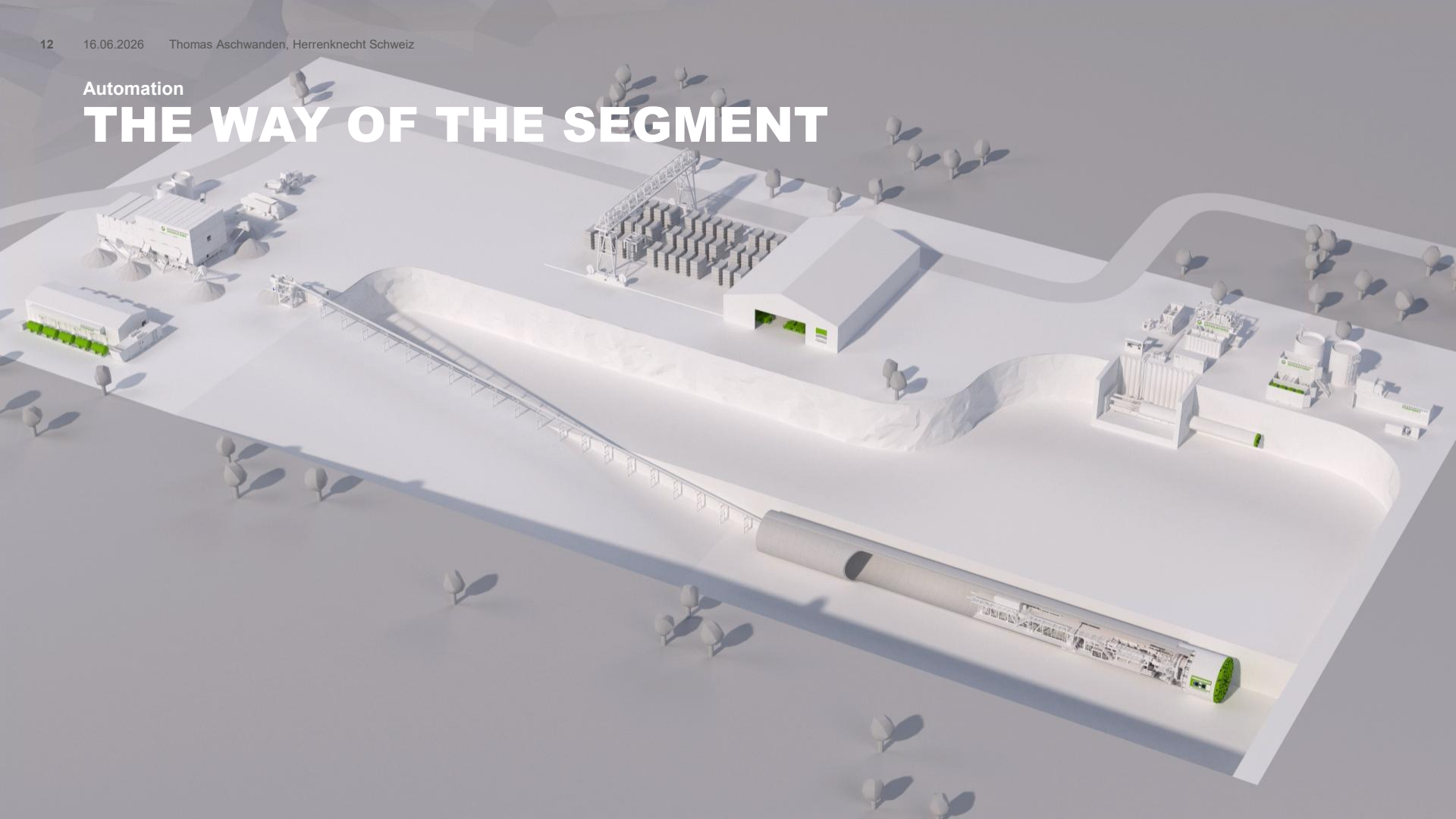
HAMPTON ROADS

- Virginia, USA
- Zwei Tunnel mit zwei Fahrstreifen
- jeweils 2,4 km lang
- Ø 13.990mm

2 AUTOMATISIERUNG

Automation

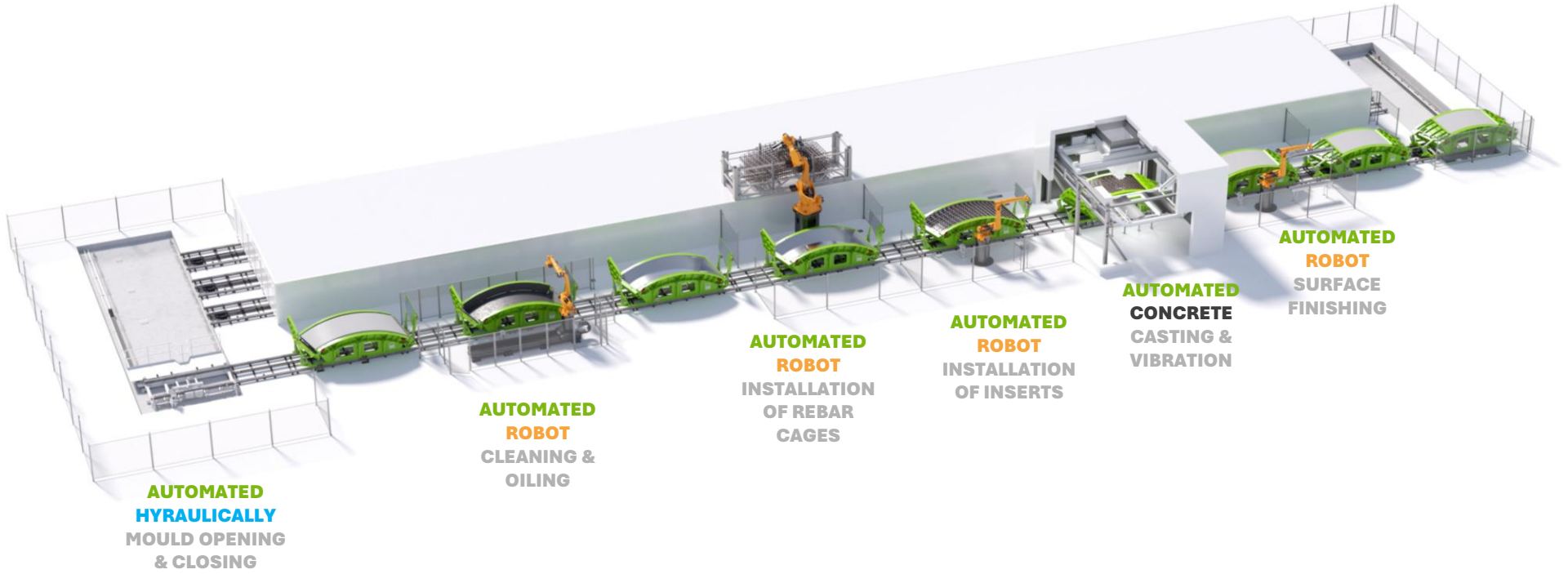
THE WAY OF THE SEGMENT



Automation

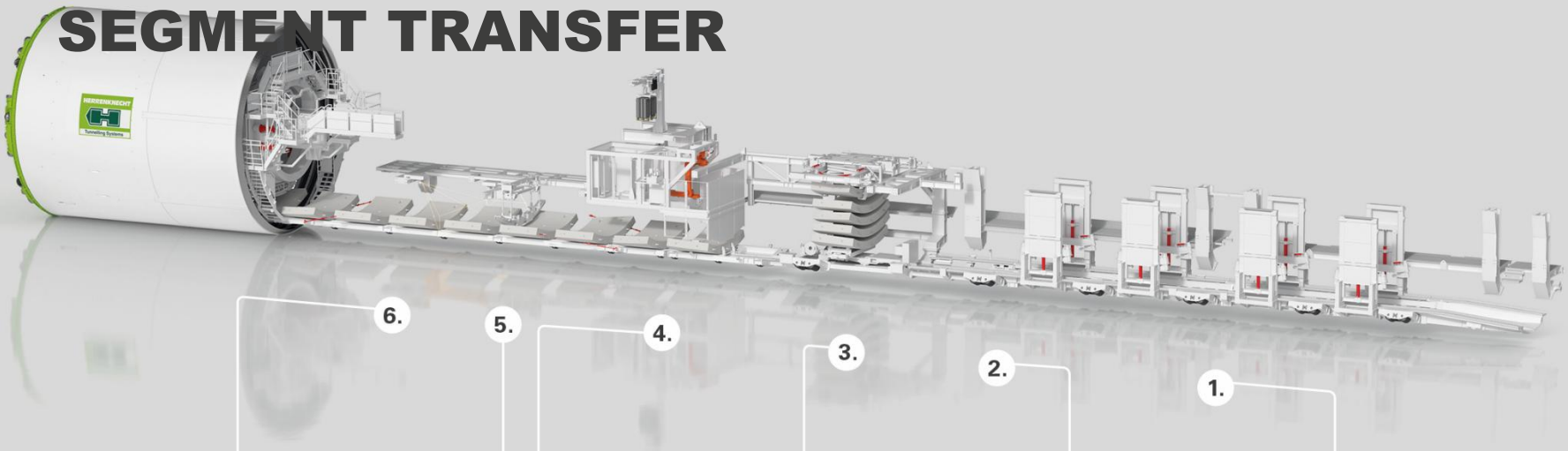
SEGMENT PRODUCTION

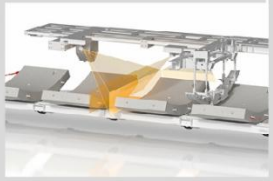
STATE-OF-THE-ART



Automation

SEGMENT TRANSFER



6. 

Visuelle Kontrolle Tübbing

5.

Reinigung der Tübbing-innenkontur

4.

Entnahme Stapelhölzer mit Roboter

3.

Vereinzelung und Transfer auf Tübbingzuführer

2.

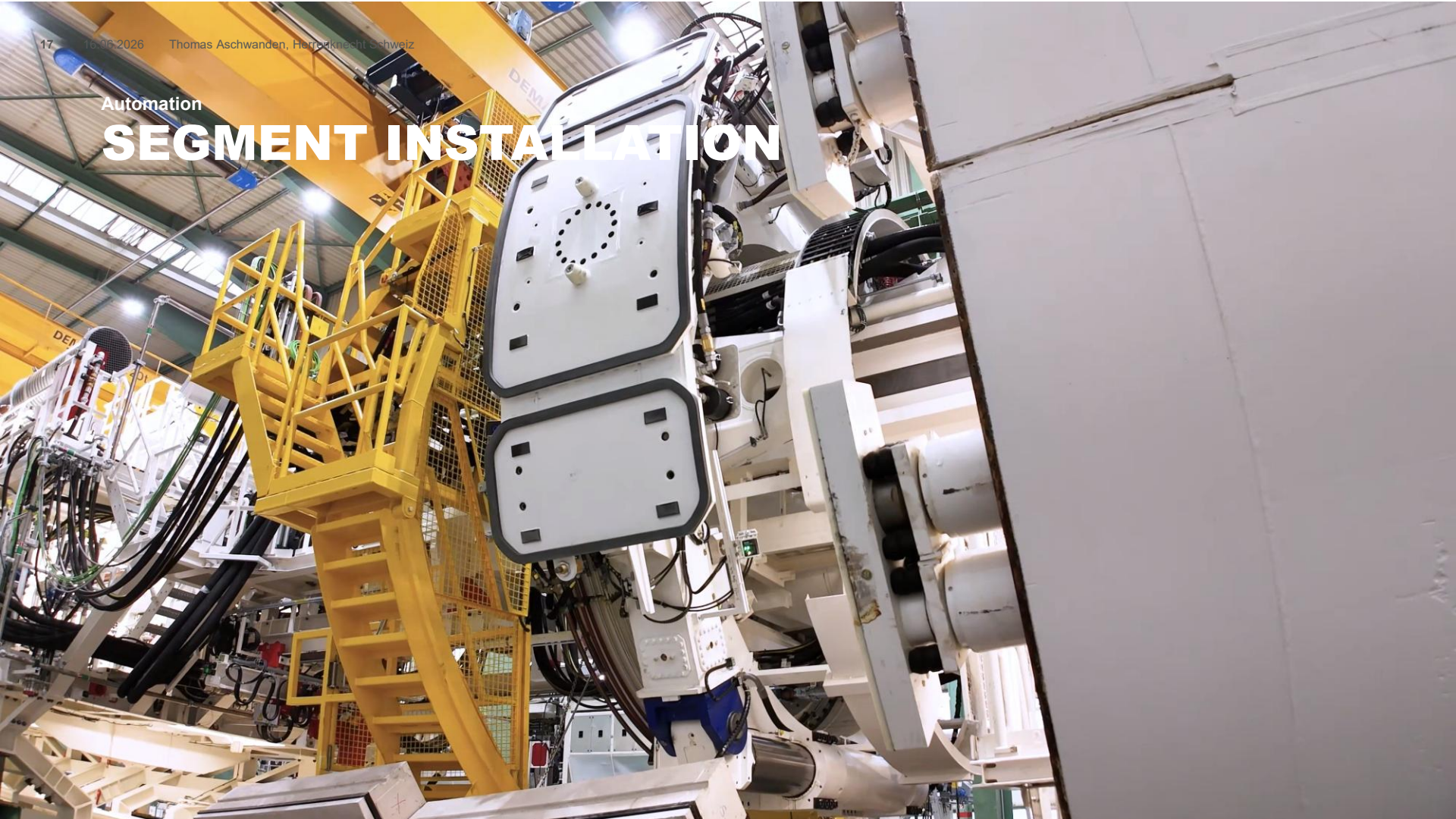
Transfer und Drehen Tübbing-stapel

1.

Anlieferung Tübbingstapel auf Schnellentladung

Automation

SEGMENT INSTALLATION



HERRENKNECHT
Tunnelling Systems

Technischer Fortschritt

CENTER OF THRUST (COT)

- Vereinfachte Steuerung des Vortriebs über Touchpanel und Human-Machine-Interface (HMI)
- Über HMI alle wichtigen Informationen für (semi-)kontinuierlichen Vortrieb auf einen Blick
- Referenzen in High Speed 2 (London), Toronto und Athen

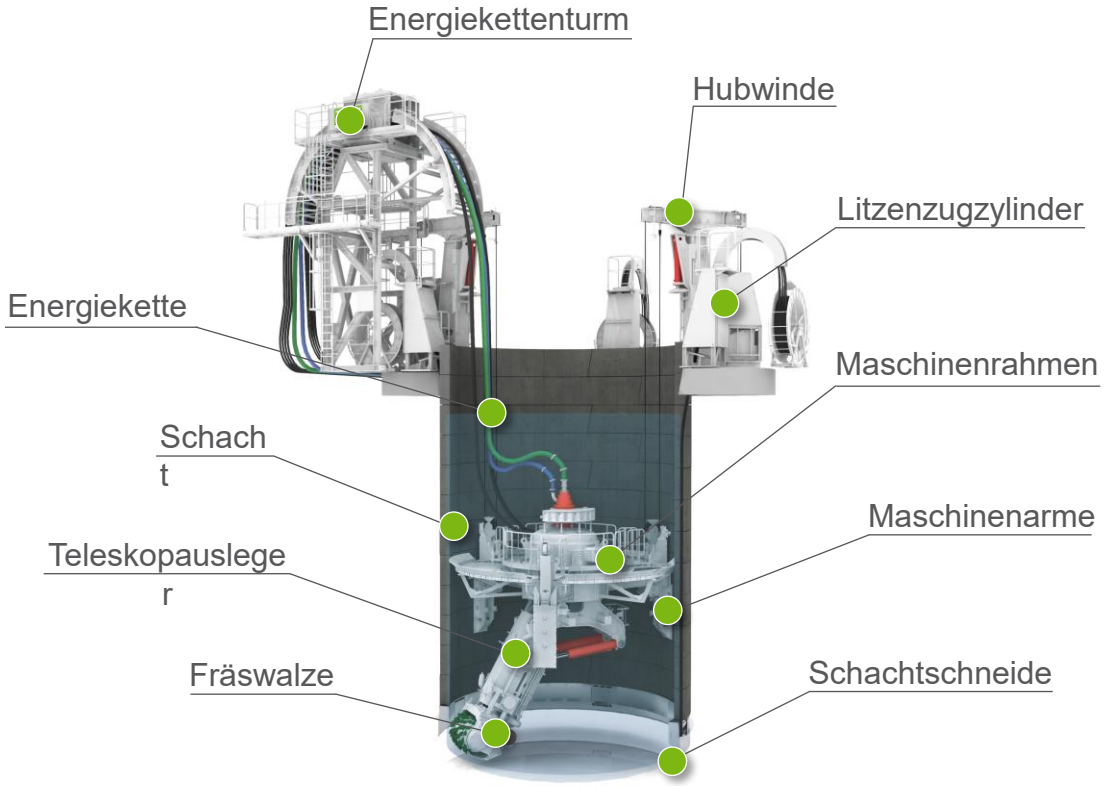
3 SCHACHTABSENK-ANLAGEN (VSM) IM URBANEN RAUM

Maschineller Schachtbau

SCHACHTABSENKANLAGE (VSM)

Weiche Böden,
Heterogene Böden,
Festgestein

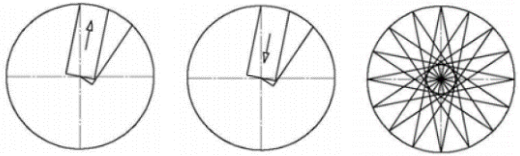
4,5 - 18 m



Maschineller Schachtbau

VSM FUNKTIONSPRINZIP ABBAUPROZESS

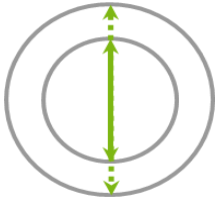
- Schritt-für-Schritt-Aushub des vollständigen Querschnitts durch flexible Steuerung der Fräswalze

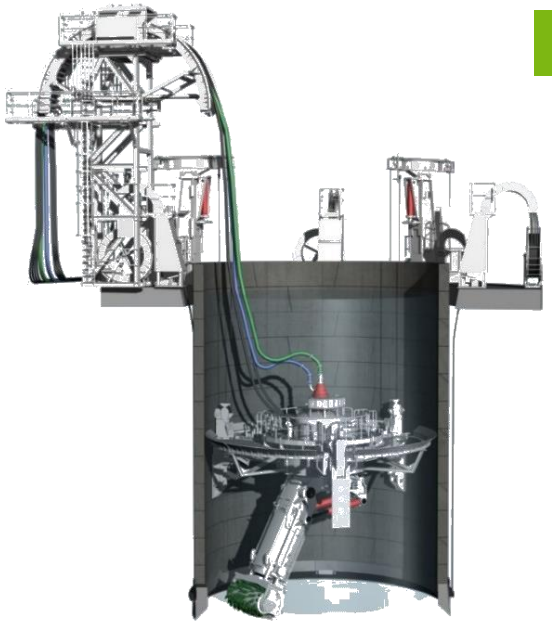


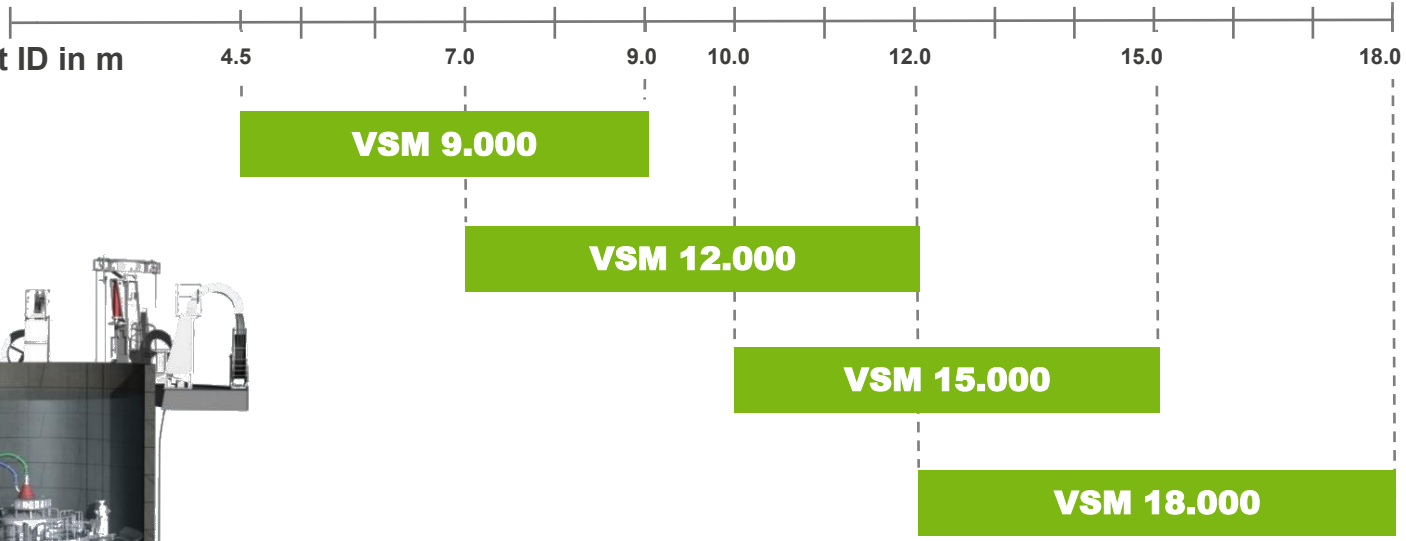
- Gleichzeitiger Abbau und Ringbau an der Oberfläche
- Der Förderkreislauf transportiert das abgebaute Material an der Oberfläche zur Separationsanlage
- Volle Kontrolle über Abbauprozess und Absenkung der Schachtstruktur

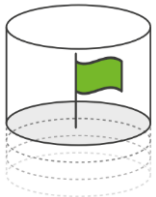
Maschineller Schachtbau

VSM DURCHMESSERBEREICH
VOLLE FLEXIBILITÄT





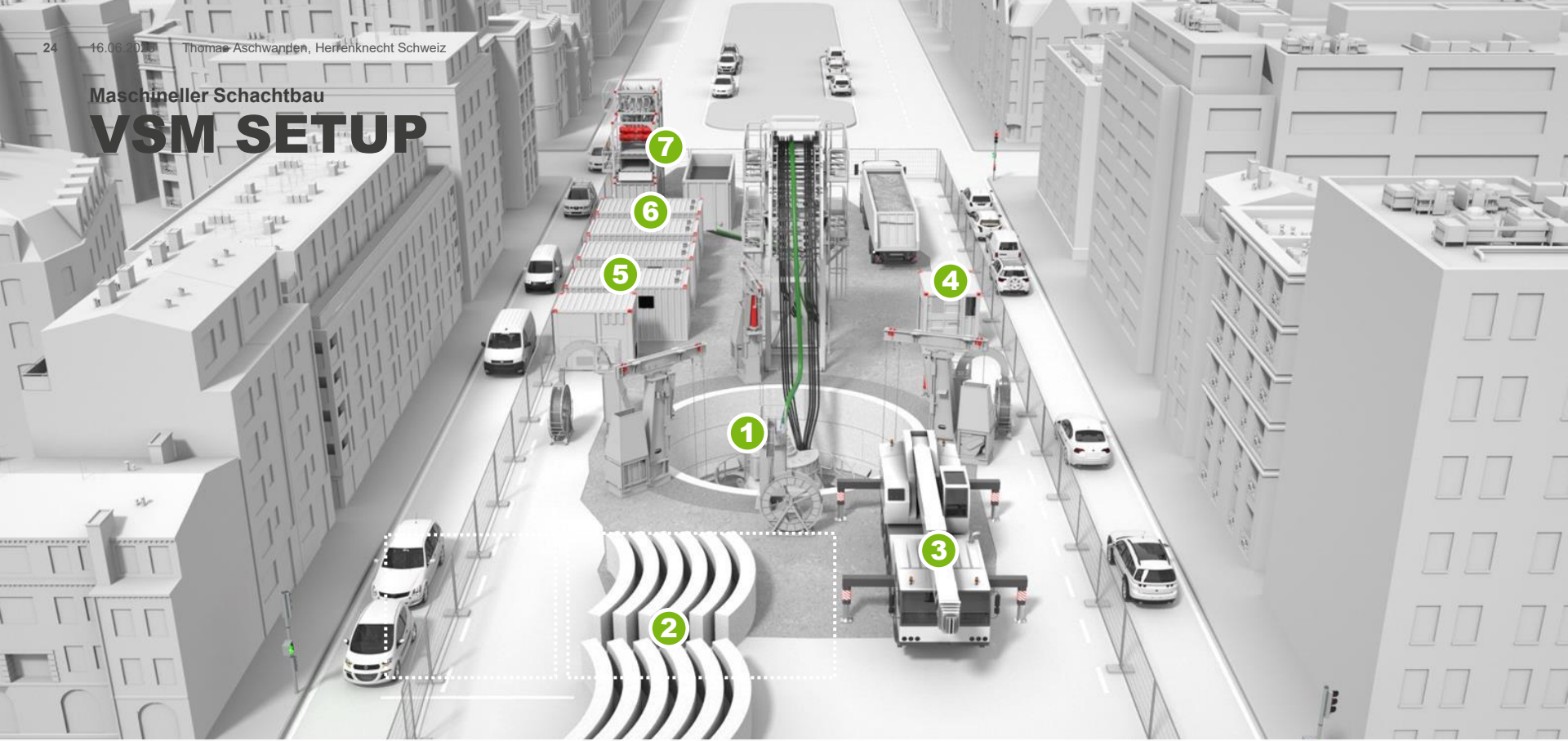




Alle Maschinen können für Schachttiefen von bis zu 250 m ausgelegt werden

Maschineller Schachtbau

VSM SETUP



1 VSM

2 Segmentlager

3 Mobilkran

4 Steuerkabine

5 Energieversorgung

6 Baustellencontainer

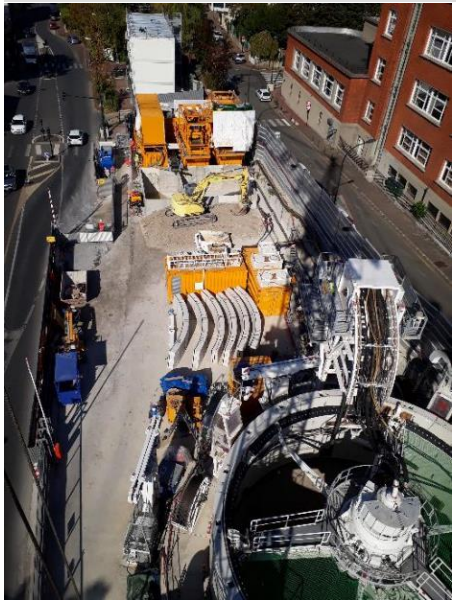
7 Separationsanlage

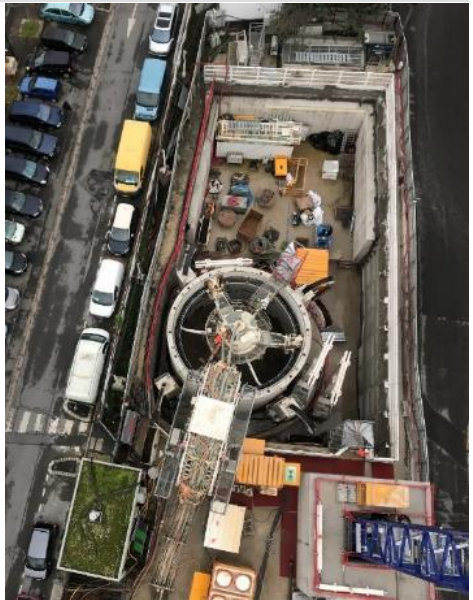
Maschineller Schachtbau

VSM SETUP
IM URBANEN RAUM

› Kompakter und flexibler Aufbau der Ausrüstung, je nach Oberflächenbedingungen

GPE – Paris, France
Shaft OD up to 12,800 mm





Girona, Spain
Shaft OD up to 5,950 mm

Noch Fragen?

Thomas Aschwanden

Geschäftsführer Herrenknecht (Schweiz) AG