

塑造智慧变革



HEXAGON

海克斯康



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iCON Pave - The Universal 3D Solution for Roadbuilding

徠卡3D摊铺控制系统应用于道路施工

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Jürgen Seemann, 道路方案经理

12th Sept., 2018



Agenda 目录

1. New Leica iCON Pave solution

- a) How does 3D paving works
- b) Key features
- c) Customer benefits

2. Leica 3D paving / milling solutions in use

3. Summing Up

4. Questions

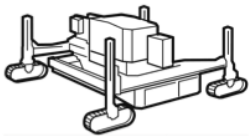
1. 徕卡3D摊铺控制系统最新方案

- a) 3D摊铺是如何工作的
- b) 主要特征
- c) 用户价值

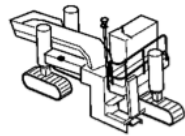
2. 徕卡3D摊铺控制系统应用案例

3. 总结

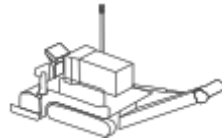
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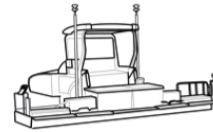
Mainline paver
滑模摊铺机



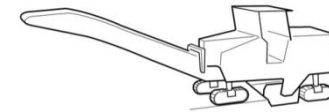
Offset Paver
侧滑模摊铺机



Trimmer
修边机



Asphalt Paver
沥青摊铺机



Cold Planer
铣刨机

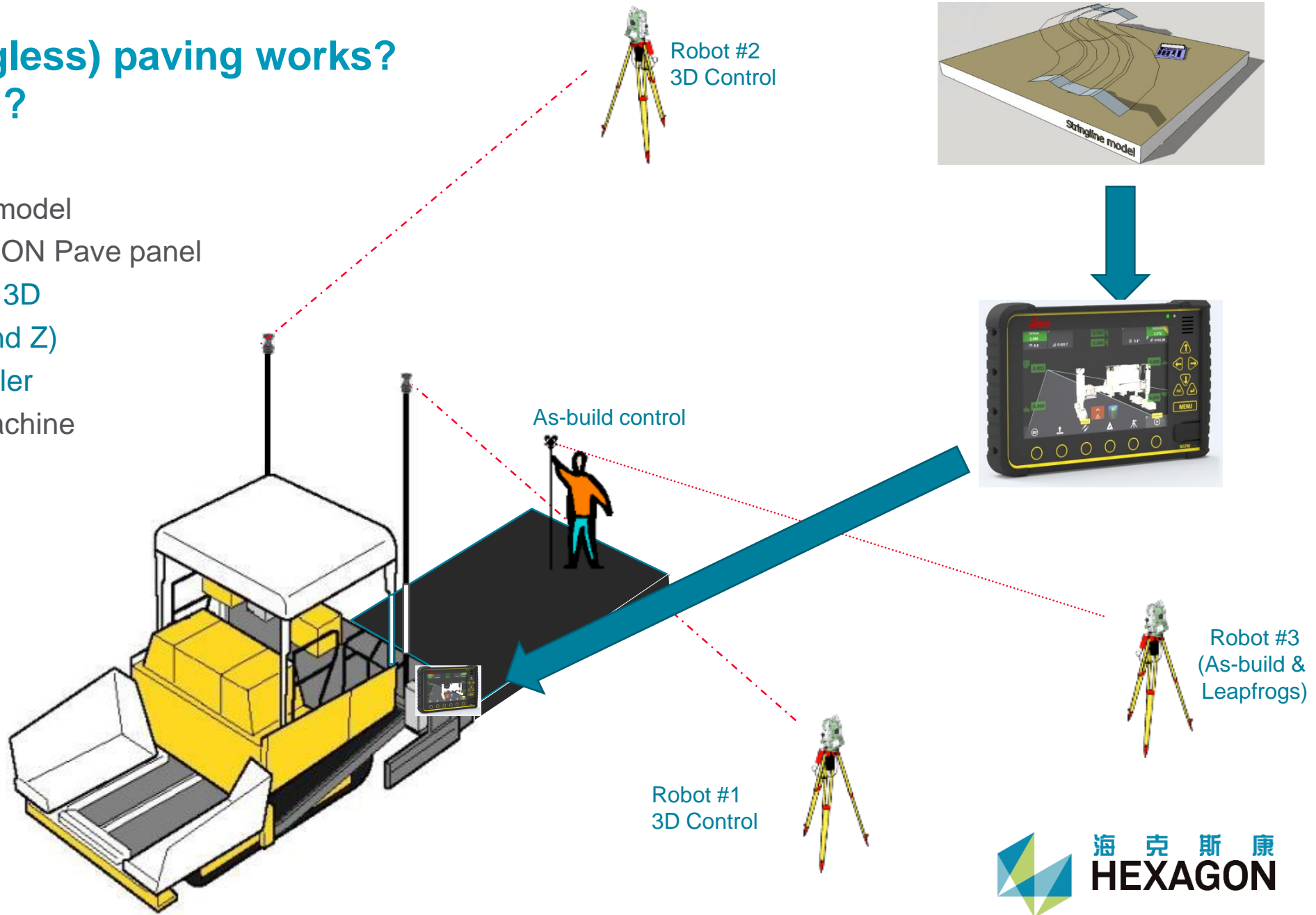
How does 3D (stringless) paving works? 3D摊铺是如何工作的？

Work Flow

1. Create “virtual” stringline model
2. Upload reference file in iCON Pave panel
3. Track machine position in 3D
4. Verify with design (X, Y and Z)
5. Output to machine controller
6. Hydraulic response on machine
7. As-build controls

workflow

1. 创建可视线路模型
2. 在面板中加载模型文件
3. 在3D模式下跟踪机器位置
4. 按设计值检核 (X, Y 和 Z)
5. 输出到机器控制器
6. 液压控制
7. 摊铺后检核



Key features of new Leica iCON Pave solution 徕卡3D摊铺控制系统新方案主要特征



1. New Hardware – unique panel / cradle concept
2. New Software with intuitive User Interface
3. 1Up patented sensor configuration
4. New Multipoint On-Machine Radio
5. Auto Leapfrog for continuous paving

1. 新硬件 – 独特的面板/基座组合
2. 直观的用户界面的全新软件
3. 专利的侧滑模配置方案
4. 全新多点电台
5. 实现连续摊铺的自动蛙跳



Customer benefits using iCON Pave 3D solution for paving and milling

徠卡3D摊铺控制系统用户价值



Cost saving 成本节省

- No need to set stringlines / less people involved / lower material costs
- Material saving potential (no over milling, no over paving)
- Increased truck efficiency



Time saving 时间节省

- No waiting for stake out
- Seaming less work flow from earth moving to paving
- Changes of reference model anytime



On spec 按设计数据高质量摊铺

- No dependency on quality of stringlines
- Consistent high paving quality (24/7)
- True radius paving (no segmented curves)



Safer operation 更安全的施工环境

- Less risk for accidents on jobs
- Walking hazard for workers near stringlines eliminated



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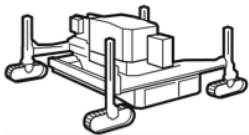
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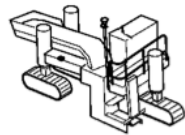
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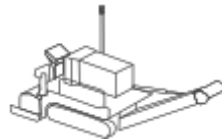
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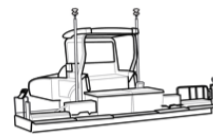
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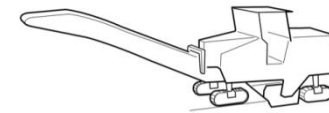
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Trimmer
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Asphalt Paver
沥青摊铺机



Cold Planer
铣刨机

Leica 3D Paving - The Universal 3D Solution in Norway

徠卡3D摊铺 – 挪威公路隧道沥青摊铺

- Contractor: Kolo Veidecke, Norway
- Project: Asphalt paving in a road tunnel
- Challenge:
 - Limited space for truck traffic; no space for stringline
 - Safety requirements
- Solution:
 - Using Vögele asphalt paver with Navitronic Basic and Leica 3D solution with single mast set up to control elevation, slope and working width
- Result:
 - ✓ **Achieved required paving accuracy**
 - ✓ **No accidents** as walking hazard for workers near stringlines eliminated
- 项目难点：
 - ①隧道施工，空间狭小；②隧道施工，安全需求更高；
- 徠卡3D摊铺应用优势：
 - ①高精度摊铺；②无触碰挂线风险，施工空间更安全；



Leica 3D Paving - The Universal 3D Solution in Turkey

徠卡3D摊铺 – 土耳其高速公路摊铺

- Contractor: Limak / Cengiz construction consortium
- Project: North Marmara Highway Project
- Challenge:
 - High requirements for smoothness and paving true to grade and slope at paving width of 18 meter
 - Time pressure on project
- Solution:
 - Gravel and base course paving with 3x Vögele pavers. Track 1 and 3 with Leica 3D; track 2 with ski following reference from track 1 and 3.
 - Binder and wearing course layer paving with big ski
- Result:
 - ✓ **Achieved requirements** for smoothness and position
 - ✓ **No joints in pavement** due to hot against hot paving
- 项目难点：
 - ① 18m宽度摊铺，质量要求高；② 施工时间紧，任务重；
- 徠卡3D摊铺应用优势：
 - ① 高精度、高质量摊铺；② 三机联铺，无需挂线，高效施工；



Leica 3D Paving - The Universal 3D Solution in Morocco

徠卡3D摊铺 – 摩洛哥体育场沥青摊铺

- Contractor: Eurologistique
- Project: Asphalt paving to prepare ground for tartan placement in athletics stadium in Morocco
- Challenge:
 - Matching high paving requirements
 - Stringline difficult to use due to ground and in curves
- Solution:
 - Using Bomag asphalt paver with Mobamatic controller and Leica 3D solution for elevation and slope control
- Result:
 - ✓ The **deviations were under the tight tolerances** for the job specification (contractor received bonus)
 - ✓ **No issues with truck access** due to any stringlines
- 项目难点：
 - ①摊铺质量要求高；②曲线等因素挂线困难；
- 徠卡3D摊铺应用优势：
 - ①高精度、高质量摊铺；②无挂线触碰风险，运料车运行更顺畅；



Leica 3D Milling - The Universal 3D Solution in Germany

徠卡3D摊铺 – 德国城市道路翻新中的铣刨和摊铺3D应用

- Contractor: Maurus, Germany
- Project: Road renovation in the city of Stuttgart
- Challenge:
 - No stringlines allowed due to safety concerns & space
 - Time pressure to finish job
- Solution:
 - Using Wirtgen cold planer and an Asphalt Paver; each with Leica 3D solution
- Result:
 - ✓ **Walking hazard eliminated** for workers near any stringline
 - ✓ **Shorter project time** (no waiting for surveyor to stake out)
 - ✓ **One data work flow** for milling and paving operation
- 项目难点：
 - ①施工工期紧；②城市空间有限及安全等因素挂线困难；
- 徠卡3D摊铺应用优势：
 - ①高精度、高质量铣刨和摊铺；②现场整洁有序，施工更安全；



Leica 3D Milling - The Universal 3D Solution in France

徠卡3D摊铺 – 法国图卢兹机场跑道翻新中的3D铣刨应用

- Contractor: Eurovia, France
- Project: Airport runway renovation in Toulouse
- Challenge:
 - Correct profile and prepare even ground for asphalt pavement
 - Time pressure to open runway again
- Solution:
 - Using Wirtgen cold planer with 3D kit and Leica 3D milling solution
- Result:
 - ✓ **Achieved even and smooth ground** for asphalt mix
 - ✓ **Shorter project time** as m/c was ready to mill after reference file upload
- 项目难点：
 - ①跑道重新开放施工工期紧；②铣刨精度直接影响沥青摊铺；
- 徠卡3D摊铺应用优势：
 - ①高精度、高质量铣刨作业；②快速铣刨，节省时间；



Leica 3D Paving - The Universal 3D Solution in USA

徕卡3D摊铺 – 美国停车场3D滑模摊铺应用

- Contractor: ESS, Missouri, USA
- Project: Paving of concrete curbs on a parking lot
- Challenge:
 - 45 concrete islands with tight curves on one site
 - Time pressure to get job done
- Solution:
 - Using Wirtgen SP15 with Leica iCON Pave with 1Up configuration for elevation, slope and heading control
- Result:
 - ✓ **Lower project costs** due to use of 3D (no stringlines)
 - ✓ **Shorter project time** as m/c was ready to pave after reference file upload
 - ✓ **Paving 1,2 m tight radius** with true arcs
- 项目难点：
 - ① 45个小半径滑模摊铺；② 施工工期紧张创精度直接影响沥青摊铺
- 徕卡3D摊铺应用优势：
 - ① 低成本、高质量、快速完成1.2m小半径摊铺作业；



Leica 3D Paving - The Universal 3D Solution in Belgium

徠卡3D摊铺 – 比利时侧滑模3D摊铺应用

- Contractor: Aclagro, Belgium
- Project: Paving curb & gutter on a new bridge ramp in a suburb of Brussel
- Challenge:
 - Project time pressure
 - C&G includes lowering for curb cuts and water inlets
- Solution:
 - Using Wirtgen SP15 with Leica iCON Pave with 1Up configuration for elevation, slope and heading control
- Results:
 - ✓ **Shorter project time** (seaming less work flow between earth moving and paving)
 - ✓ **Curbs were used as reference** for asphalt paving
- 项目难点：
 - ①施工工期紧；②滑模包含人行道斜坡和排水口；
- 徠卡3D摊铺应用优势：
 - ①高精度、高质量、快速的滑模作业，用于之后的沥青摊铺参考；



Leica 3D Paving - The Universal 3D Solution in UK

徕卡3D摊铺 – 英国港口码头滑模3D摊铺应用

- Contractor: Volker Fitzpatrick, UK
- Project: Concrete pavement in a container terminal in Felixstowe seaport
- Challenge:
 - High requirements for an even pavement for autonomous container vehicles
 - High safety standards on UK job sites
- Solution:
 - Using Gomaco concrete pavers with 3D kit and Leica new iCON Pave 3D solution for mainline slipform paving
- Result:
 - ✓ **No accidents** as walking hazard near stringlines eliminated
 - ✓ **Achieve high and consistent** paving accuracy
- 项目难点：
 - ①高精度要求用于自动集装箱运输；②英国施工工地高安全性要求
- 徕卡3D摊铺应用优势：
 - ①高精度、高质量摊铺作业；②没有挂线，现场人员更安全；



Leica 3D Paving - The Universal 3D Solution in China

徕卡3D摊铺 – 中国江西赛车道3D摊铺应用

- Contractor: JiangXi Liang Da, China
- Project: Asphalt paving on karting circuit
- Challenge:
 - Tight curves which makes paving with big ski impossible
 - High requirements for a smooth pavement for karts
- Solution:
 - Using Vögele asphalt paver with Niveltronic and Leica 3D solution with dual mast set up for paving width > 6 m for elevation control on either side
- Result:
 - ✓ Achieved required accuracy by **eliminating the inaccuracy of stringlines** on this complex project
 - ✓ **Improved truck efficiency** as no stringlines hindered access
- 项目难点：
 - ①多弯道施工困难，多处变宽及变坡；②赛车道摊铺质量要求高；
- 徕卡3D摊铺应用优势：
 - ①完全按照设计施工，高质量摊铺作业；②没有挂线，现场更安全；



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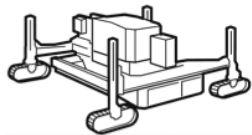
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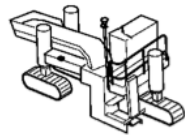
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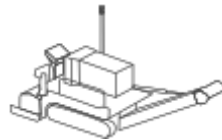
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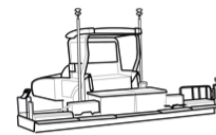
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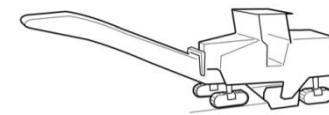
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Leica iCON Pave - The new universal 3D solution for Roadbuilding

徠卡3D摊铺控制系统



supports you completing projects everywhere

支持您在任意地点完成高效施工：

✓ ON BUDGET

✓ 保障预算



✓ ON TIME

✓ 按期完工



✓ WITHIN SPECIFICATION

✓ 按设计施工



✓ SAFELY

✓ 安全施工

➤ depending on projects savings ~ 15 – 30%

➤ 根据不同项目节省15-30%

Questions ? 疑问?

—— 谢 谢 ——

