



Pre-decorated MiC units: A global perspective on trends, standards and performance solutions for waterproofing, tiling and flooring

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As one of the leading building material manufacturers,
the ARDEX Group is represented in over 50 countries.

AT A GLANCE:

1949 Founded

3,400 Employees

870 mEUR Revenues

46 Production Facilities

59 Subsidiaries

More than

18

successful
brands

More than

2,400

different
products

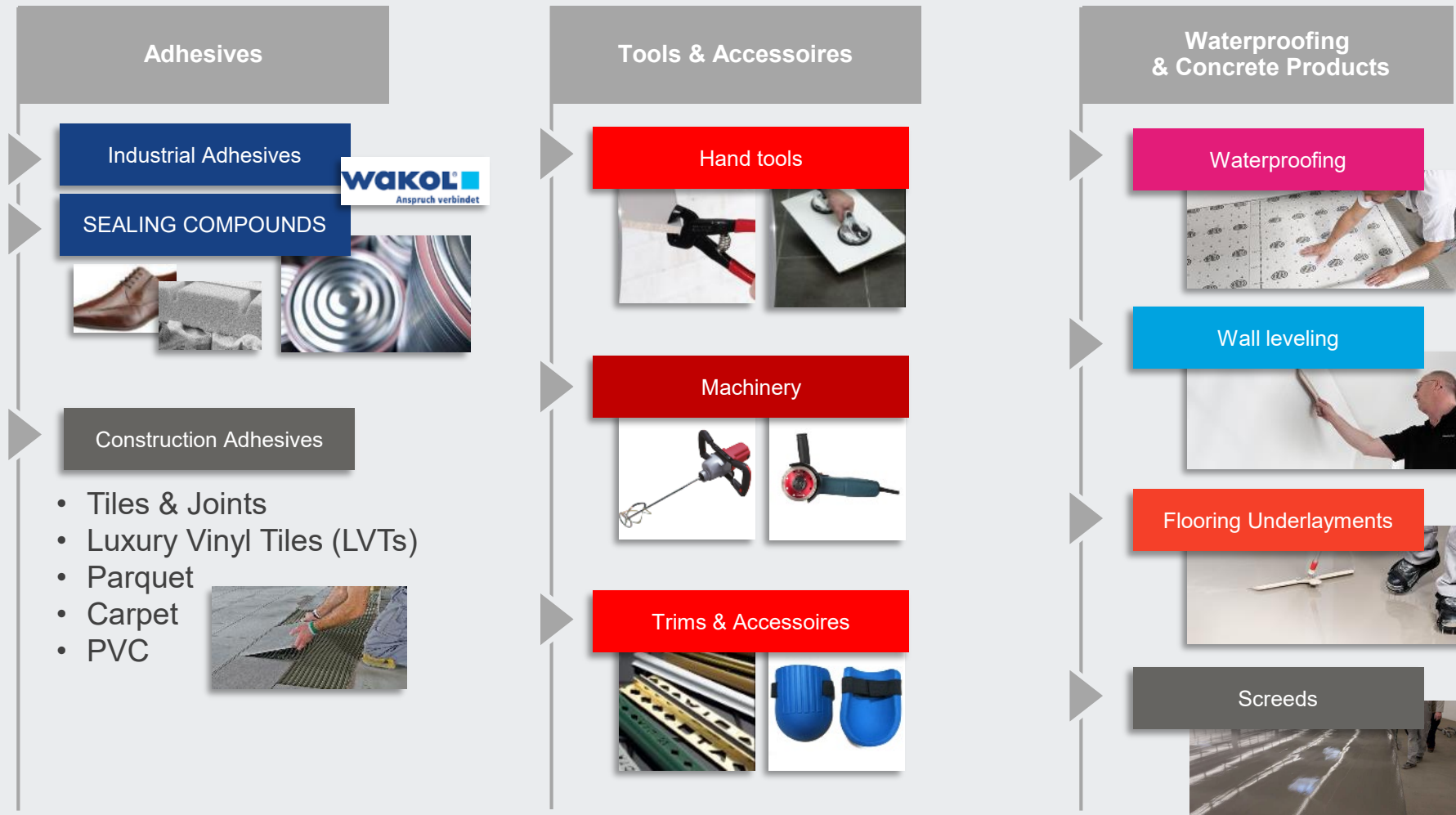
More than

25

product
categories



We are committed to offering an extended portfolio, covering the whole range of customer needs.



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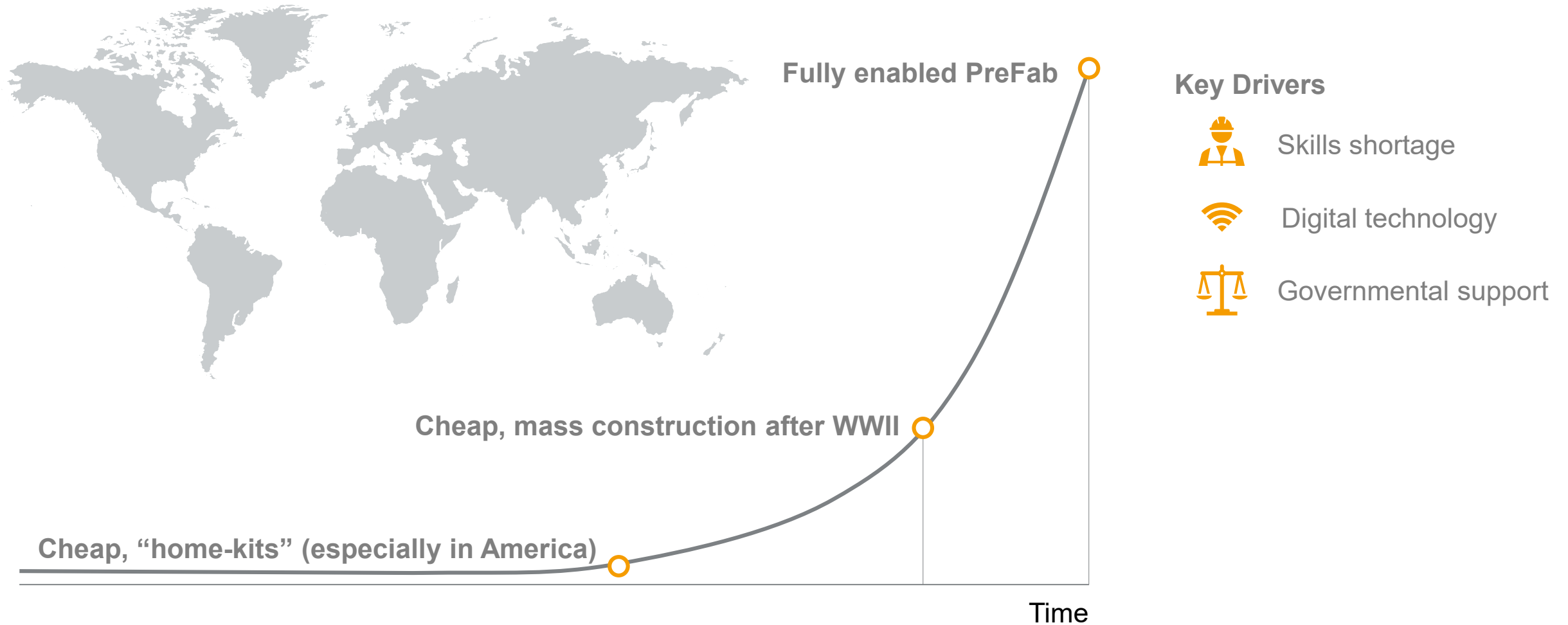
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A building site is the worst place to control quality, efficiency, costs, job satisfaction and work environment

Source: Smith Innovation (Danish consultancy firm working independently with R&D in the building industry)

This time, PreFab is here to stay and scale.



Key Advantages of PreFab

Increased speed

- Production planning during first construction phase
- Efficient production process in controlled environment
- Fast installation on site

Environmental aspects

- Efficient material supply to fabrication plant
- Reduced waste
- Reduced logistics

Improved safety

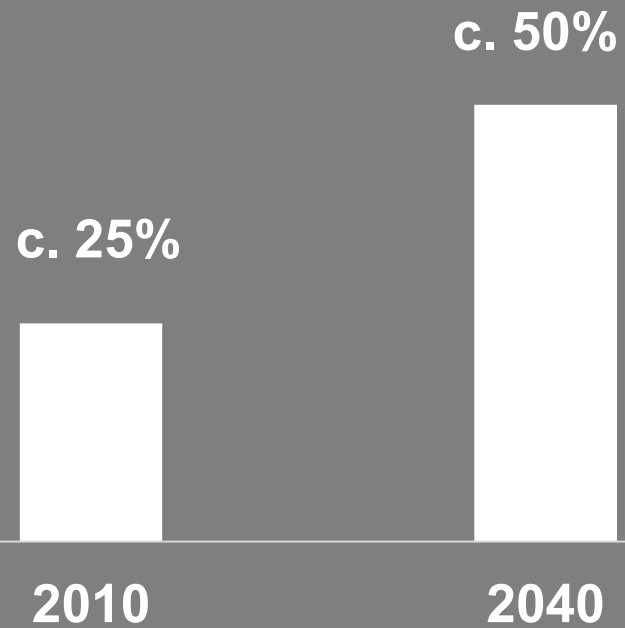
- Controlled environment





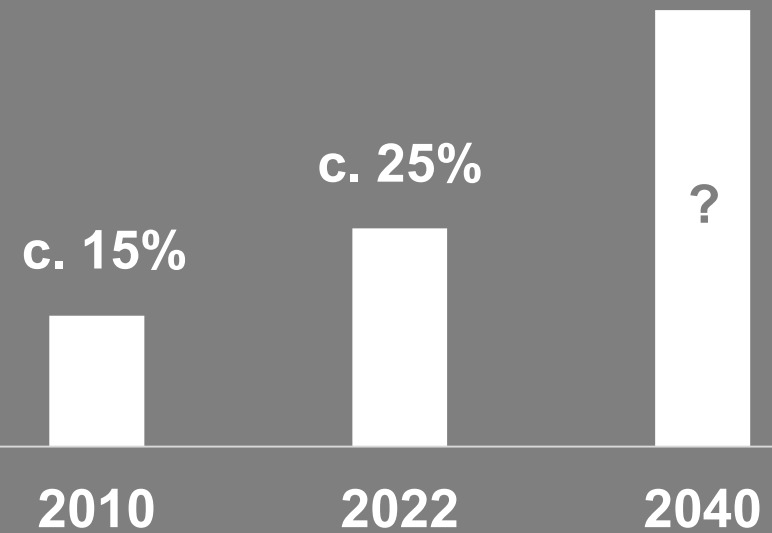
The world

Asia's share of global GDP



Construction

PreFab's share of the German housing market





Traditional
construction



Semi-finished
walls/slabs



PPVC



Onsite

Offsite



Precast



PBU

Degree of ARDEX
products used offsite



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Typical PreFab Applications in Europe: “2D” Components



Description

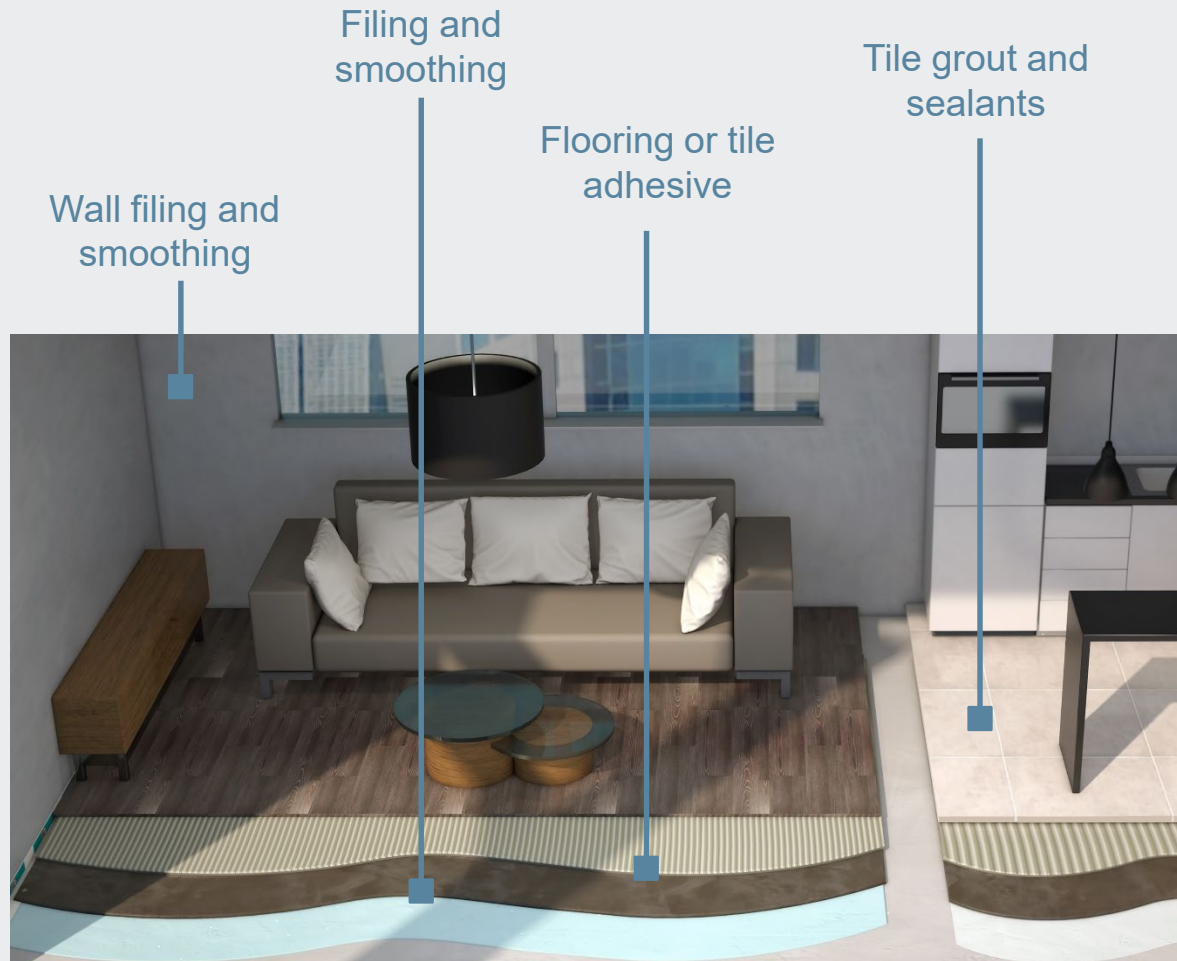
- Semi-finished prefabricated walls to minimise work on site
- Mostly regional within Central Europe with a market share of more than 20% in the segment family homes
- Mostly timber-frame construction
- Positive: Use of renewable raw material



Technical issues:

- Potential transportation damage
- Assembly and jointing on site, especially waterproofing
- Challenge for multi-story buildings: Fire resistance of timber structure

Typical PreFab Applications in Europe: “3D” Fully Finished Modules



Description

- Fully completed prefabricated modules
- Structure:
 - Steel frame,
 - Timber frame,
 - Pre-cast concrete module,
 - GRP (glass-fibre reinforced polymer) module

Technical Issues:



- Industrial standards cannot always be applied
- Drying time of concrete for concrete modules
- Vibration during transport and impact on waterproofing and tile fixtures
- Assembly and jointing of modules on site, especially waterproofing

Interior Finishing Challenges of PreFab

- Common construction methods developed for onsite construction, e.g. screed
- Existing construction and decoration standards do not always meet the new requirements of off-site construction. No new standards developed yet.
- Standard construction materials are not designed for PreFab use:
 - Long open time in different climate conditions for onsite application

What PreFab requires:

Special products and systems for efficient offsite-production processes:

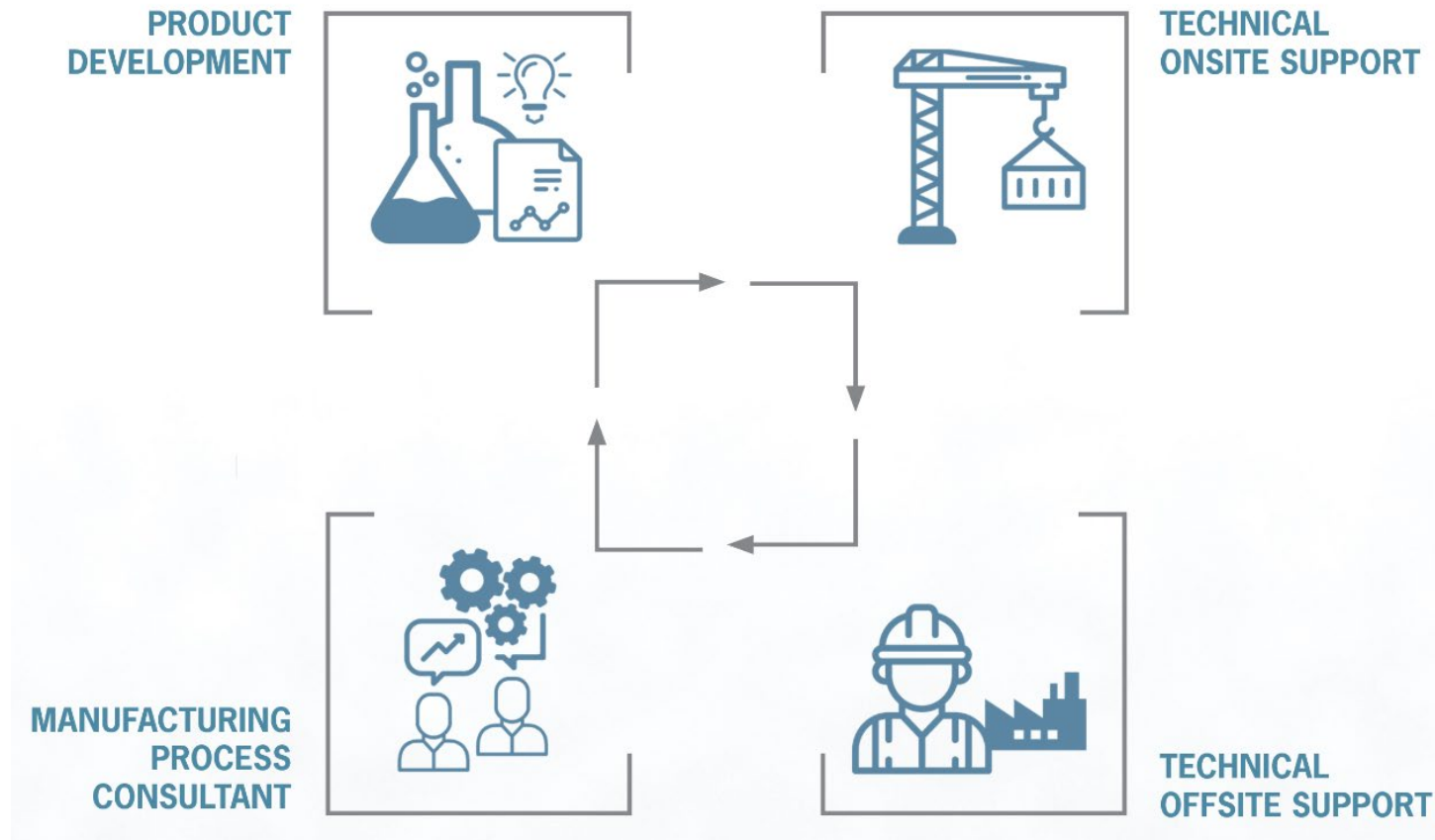
- Rapid drying
- Machine application possible



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Material Solutions for MiC – More than just a Material Supplier



Material Solutions for MiC – Guaranteed Performance and Quality



WHAT IS MICROTEC?

A unique binding matrix made up of exclusive ARDEX materials, special cements and polymers combined with high performance fibres which improves adhesive strength, reduces the effect of shear strain and stress on the tiling system.



WHAT IS ARDURAPID?

'RAPIDRY FORMULA' Technology or ARDURAPID technology binds the water used for mixing within the cement. Therefore, the mix water is utilized chemically to build a reinforced structure. This technology ensures rapid drying and strength development, regardless of thickness, guaranteeing a shrinkage free high strength system and virtually eliminating the risk of water staining.



WHY WATERPROOFING SHEET MEMBRANE?

Super fast application – just one layer required
Bridges cracks
After 2 hours ready to receive tiles



Pipe Collar



Inside Corner



Detail Tape



Tiling and Waterproofing as the Main Technical Challenge

Filling and smoothing

Waterproofing system

Tile adhesive and grout, sealants

Shower drains



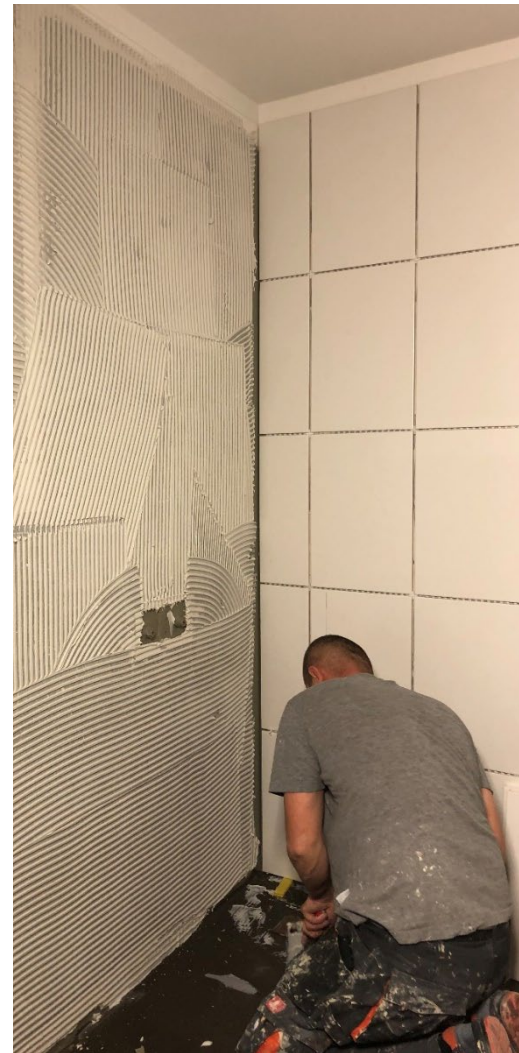
ARDEX Technical Solutions

- “Layered design” of finishes
- Adoption of highly flexible cementitious systems, capable to withstand vibration and transport
- Re-enforced waterproofing systems for joints and connections (crack bridging)

ARDEX Service Solutions

- Design support
- Installer training
- Supervision in workshops and on site

Tiling and Waterproofing as the Main Technical Challenge



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Industry Example of 2D PreFab



INDIVIDUAL DESIGN IN SPITE OF PREFAB CONSTRUCTION

FAMILY HOME:
Cologne, Germany

- Timber frame construction, semi-finished walls

USED PRODUCTS:

- Tile adhesive and grout
- Waterproofing system for bathrooms



LUXHAUS.



Industry Example of 2D PreFab



INDIVIDUAL DESIGN IN SPITE OF PREFAB CONSTRUCTION

FAMILY HOMES “SOLAR-QUARTIER”: Bad Kreuznach, Germany

- Efficiently produced prefabricated hollow wooden block wall, filled with concrete on site.
- Fully-integrated planning process (BIM)

USED PRODUCTS:

- Fast-setting adhesive for the fixation of gypsum board panels
- Tile adhesive, waterproofing system for bathrooms

(source: <https://futurehaus.de>)

Industry Example of 3D PreFab



FULLY-FINISHED PREFABRICATED BATHROOM PODS

SERIAL PRODUCTION OF 700 PODS PER WEEK:
UK Production Facility used for international Projects

- Individually designed
- Efficiently produced
- GRP or steel frame
- Guaranteed leak-free

USED PRODUCTS:

- Flexible tile adhesive and grout

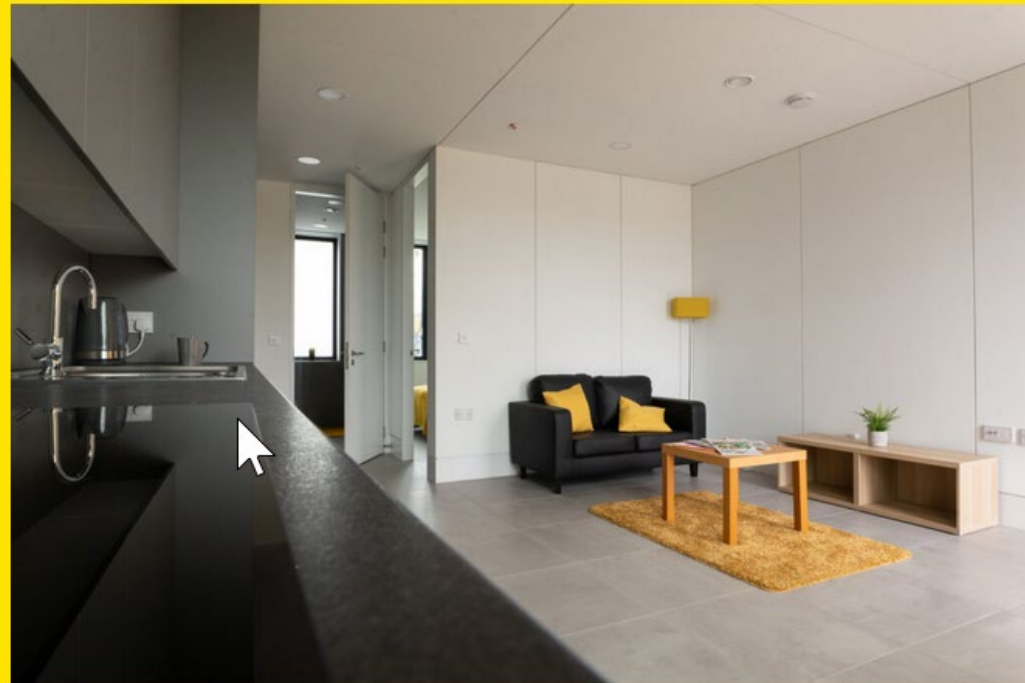
Industry Example of 3D PreFab – Timber Frame Modules fully finished



A CGI of the 39 homes built by INNO, an offsite volumetric housing solution by AECOM and Rogers Stirk Harbour + Partners

Source: AECOM publicly available website

Case study: YMCA Romford and INNO



Inside one of the apartments at YMCA Romford

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Outlook

- Increasing demand for fast-track construction
- Design integration between planners, suppliers and contractors (BIM)
- Special solutions and construction methods needed to increase efficiency of offsite-production
- Development of international standards for prefabrication needed
- Growing trend for light-weight pre-cast concrete modules



Q & A