Tamper proof with Track & Trace
Challenges in Practice

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Center of Competence Marking Technologies & Data-Matrix-Code
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Schaeffler at a glance

Global customer proximity

Schaeffler at a glance

Germany
- Bühl
- Eltmann
- Gunzenhausen
- Hamm/Sieg
- Herzogenaurach
- Hirschaid
- Höchstadt (2)
- Homburg (3)
- Ingolstadt
- Kaltennordheim
- Lahr
- Luckenwalde
- Magdeburg
- Morbach
- Schweinfurt (2)
- Steinhagen
- Suhl
- Unna
- Wuppertal

Europe
- Austria
  - Berndorf-St. Veit
- Italy
  - Momo
- Czech Republic
  - Lanskroun
- Spain
  - Elgoibar
- Portugal
  - Caldas da Rainha
- Great Britain
  - Llanelli
- Plymouth
- Sheffield
- Switzerland
  - Romanshorn

France
- Calais
- Chevilly
- Haguenau (2)

Romania
- Brașov
- Skalica

Höchstadt (2)
- Homburg (3)
- Ingolstadt
- Kaltennordheim
- Lahr
- Luckenwalde
- Magdeburg
- Morbach
- Schweinfurt (2)
- Steinhagen
- Suhl
- Unna
- Wuppertal

Spain
- Elgoibar

Switzerland
- Romanshorn

Canada
- Stratford (2)

USA
- Cheraw (2)
- Danbury
- Fort Mill (2)
- Joplin
- Spartanburg
- Troy
- Wooster

Mexico
- Irapuato
- Puebla

Brazil
- Sorocaba (2)

Production (74) ■ R&D Centers (17)

Canada
- Stratford (2)

USA
- Cheraw (2)
- Danbury
- Fort Mill (2)
- Joplin
- Spartanburg
- Troy
- Wooster

Mexico
- Irapuato
- Puebla

Brazil
- Sorocaba (2)

Production (74) ■ R&D Centers (17)
Schaeffler at a glance

Shareholders and Board of Managing Directors

Shareholders of the Schaeffler AG

Georg F. W. Schaeffler
Chairman of the Supervisory Board
Maria-Elisabeth Schaeffler-Thumann
Deputy Chairman of the Supervisory Board

Managing board of Schaeffler AG

Rosenfeld, Klaus
CEO

Prof. Dr. Gutzmer, Peter
Deputy CEO
Chief Technology Officer

Dr. Hauck, Ulrich
CFO

Dr. Spindler, Stefan
CEO
Industrial

Prof. Dr. Pleus, Peter
CEO
Automotive

Indlekofer, Norbert
CEO
Automotive

Schittenhelm, Corinna
Chief Human Resources Officer

Jung, Oliver
Chief Operating Officer

Steering Committee
STOP-Projekt
Schaeffler at a glance

Industrial – Bearing solutions for more than 60 sectors

INA-FAG catalog with 40,000 articles

Axial / radial roller bearings with an outside diameter of up to 4,250 mm (up to 12,000 mm available on special request)

Spherical plain bearings

Cylindrical roller bearings with disc cage

Radial insert ball bearings

Cage-guided cylindrical roller bearings

Yoke type and stud type track rollers

Tapered roller bearings

Spherical roller bearings

Needle roller bearings

Housings

Main spindle bearings

Direct drives

Engine bearings

Linear guidance systems

Rotary table bearings with measuring system

Active magnetic bearings

Smallest ball bearing with a 1 mm inside diameter

Industrial – Bearing solutions for more than 60 sectors
Schaeffler at a glance

Automotive – Broad product portfolio

- Longer Operating Life
- Reduced Weight
- Improved Dynamics
- Increased Safety
- Less Wear

- Energy Savings
- Increased Driving Comfort
- Reduced Costs
- Improved Dynamics
- Easier Assembly
Damage because of Product piracy

Impact of Product piracy:

- 50 billion € turnover missed (Germany)\(^1\)
- 70,000 jobs lost (in Germany)\(^1\)
- Estimated economic loss for Schaeffler: ~ 170 Mio. €/ year

\(^1\) lt. DIHK
Problems

Original

Fake
Problems
Problems
Our technical proactive approach

Security technologies for original products in the Schaeffler Group
Group Project STOP

Security technologies
Group Project STOP

The Target: Modular system of security technologies

- **Physical Security**
  - Additional security technologies depending on use cases, parts, ...

- **Logical Security**
  - Data-Matrix-Code on single part
  - Data-Matrix-Code on the package
  - Track- & Trace

- **Base Security**
  - Package design

- **Increasing security**
  - Single part
  - Foulding box
  - Overall system
Group Project STOP

The Schaeffler code → Standard
Group Project STOP

Server Concept

Internet

Retailer/Costumer

TECCOM Server

Upload

Central STOP-Server

Administration

Direct part marking

Communication library

Write DMC

Read DMC

Direct part marking

Communication library

PLC-Linker

Write DMC

Read DMC

Label marking

Communication library

Write DMC

Read DMC

Fallback solution for network problems exists
Productive
several manufacturers are marking their complete portfolio with the MAPP-Code, some only selected product lines

incl. direct part marking
Group Project STOP

Center of Competence

Foundation of Center of Competence placed at special machinery department
(Decision of STOP Steering Committee 01/2009)

Scope of services from CoC:
- Advising, testing and quoting for marking methods
- Advising, testing and quoting for code reading methods
- Developing of marking stations with added values
- The use of standard units if possible (e.g. TRUMPF-Laser cell)
- Engineering benefits (e.g. integration in production lines)
- Building and implementing of marking solutions
- Advising the layout of the Data-Matrix-Code
- Installation and adaptation of the related data bank
Examples

**Labels**

- Definition small number of label formats
- Definition of one Standard label material (Paper and Thermo transfer foil)
- Definition Resolution of printer at least 300dpi
- Ensure Readability of the Data-Matrix-Codes
Schaeffler Standard Printer with integrated DMC Scanner
Development done by Schaeffler and Clever Systemtechnik GmbH
Example

High precision bearing
Example

High precision bearing

Change the whole concept

Customer Requirements:
Secure against fakes → Sticker with color changing effect

• High requirements at production side:
  • Drill deepening into bearing
  • Fixing sticker with special glue
  • Hardening time of glue 72h → Stock holding needed (costly)
  • Even with hardening time no guarantee of loosing sticker
  • Security of supply

→ After consultation with customer Sticker was replaced by DMC (Schaeffler code)

→ Schaeffler can provide additional services via Smartphone App "Precision desk"
Example

Large size bearings
Example

Large size bearings

Schaeffler Hand guided laser
Example

Large size bearings
Example Laser Software

Schaeffler Marking Interface
Thank you for your attention

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