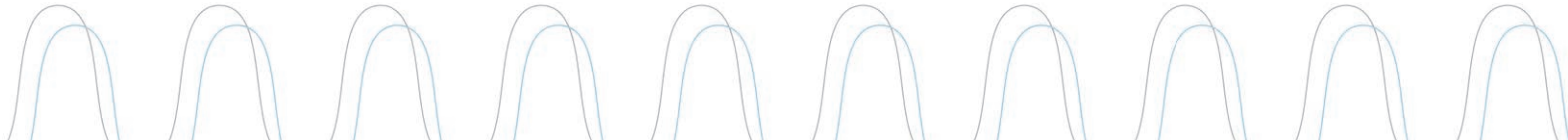


HDT

linking people
and technology

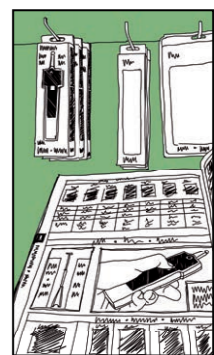
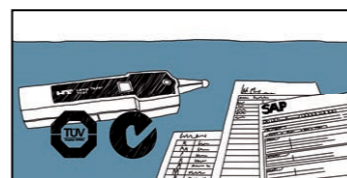
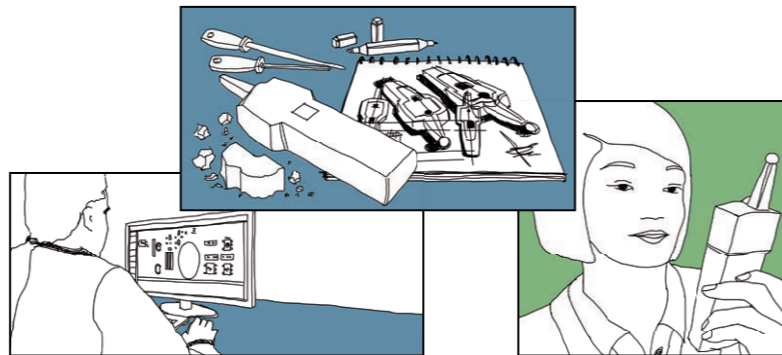
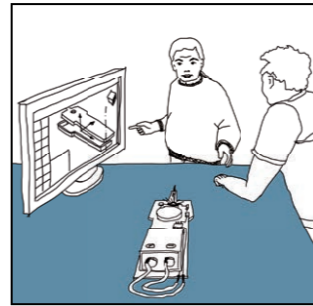
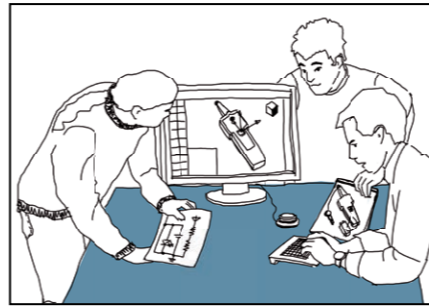
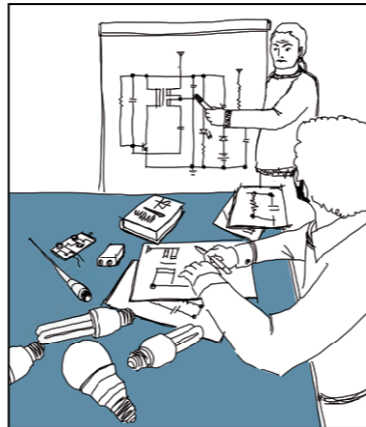
Product Development Process

12 steps from idea to mass production



Product Development Process
12 steps from idea to mass production

TEST



Product Definition

Pre-Phase

Understanding Customer Requirements
ODM Agreement

Requirement Specification

Project Start
Project Set-up
Schedule

Technology Development

Development of New Technologies, if required

Detailed Specification

Detailed Description of Product
Size and Position Inside Defined

Product Development

Industrial Design I

2D Sketches and Foam Models
Man-Machine-Interface Definition
Functional Samples

Industrial Design II

Design 3D Data, Design Mock-up
Interfaces "Inside-Outside"

Detailed Development

Housing Concept
Electronic, Mechanic Detailed Development

Engineering Sample

Full Functional Mock-up
Testing According to Specification
Design Freeze

Transfer to Production

Engineering Pilot

5-10 Samples with Out-of-tool Parts and Final Electronics

Pre-Pilot

20-50 Pieces Assembled with Final Production Toolings

Pilot Run

100-200 Pieces Assembled on Production Line

Mass Production

According to Customer Order

Product Definition

Pre-Phase

Understanding Customer Requirements
ODM Agreement

Requirement Specification

Project Start
Project Set-up
Schedule

Technology Development

Development of New Technologies, if required

Detailed Specification

Detailed Description of Product
Size and Position Inside Defined



Product Definition

Pre-Phase

Requirement
Specification

Technology
Development

Detailed
Specification

Understanding Customer
Requirements

ODM Agreement

Process Owner

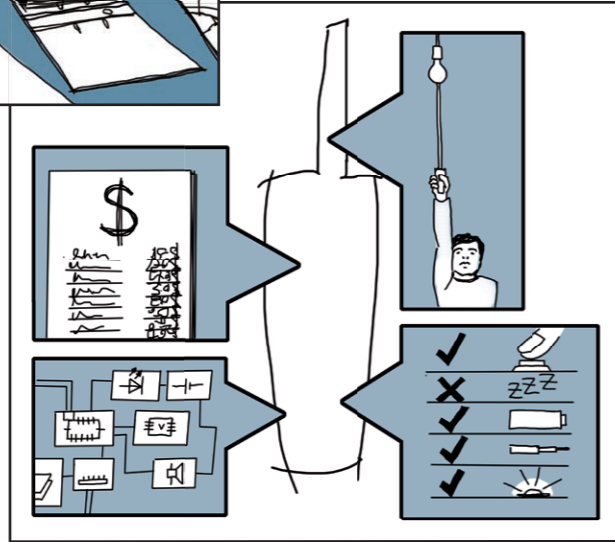
Product Lifecycle
Management

Involved

Customer
Sales
Product Manager
Development Team Leaders
General Manager

Documents | Samples

Customer wishes
(email, minutes of meeting, ...)
ODM project proposal
Business case
Internal projects:
Market and Application Summary
Technical report
SAP quotation
Customer order
Agreed pre-payment
Project release



Product Definition

Pre-Phase

Requirement
Specification

Technology
Development

Detailed
Specification

Project Start

Project Set-up

Schedule

Process Owner

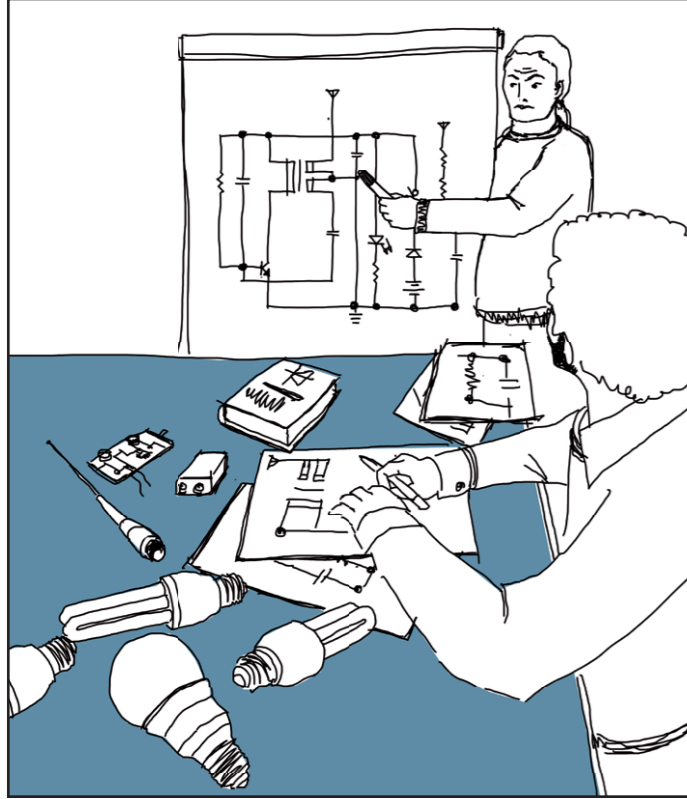
Product Lifecycle
Management

Involved

Customer
Product Manager
Development Team Leaders
Assigned Developers

Documents | Samples

Project folder
Project Requirements
Product concept
Technology Development document (if required)
Project members
Team meetings
Customer approval of final requirement specification



Product Definition

Pre-Phase

Requirement
Specification

Technology
Development

Detailed
Specification

Development of New
Technologies, if required

Process Owner
R&D Management

Involved
Product Manager
General Manager
Development Team Leaders
Assigned Developers

Documents | Samples
Task description
Project description
Technical documentation
Functional samples



Product Definition

Pre-Phase

Requirement
Specification

Technology
Development

Detailed
Specification

Detailed Description of Product

Size and Position
Inside Defined

Process Owner

Product Lifecycle
Management

Involved

Customer
Product Manager
Development Team Leaders
Assigned Developers

Documents | Samples

Detailed specification w. function, standards, tests
Product concept, mechanical and electrical
Package „The Inside“
Progress reports
Action List
Update of project and product cost (if required)
Customer approval of final specification
(if different to requirement specification)

Product Development

Industrial Design I

2D Sketches and
Foam Models

Man-Machine-Interface
Definition

Functional Samples

Industrial Design II

Design 3D Data, Design
Mock-up

Interfaces "Inside-Outside"

Detailed Development

Housing Concept

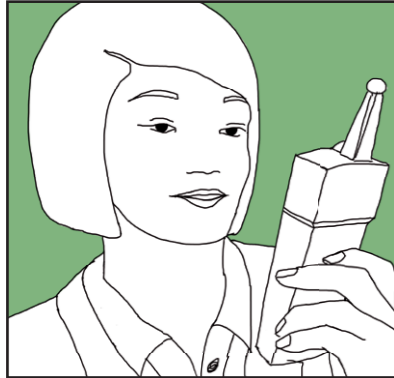
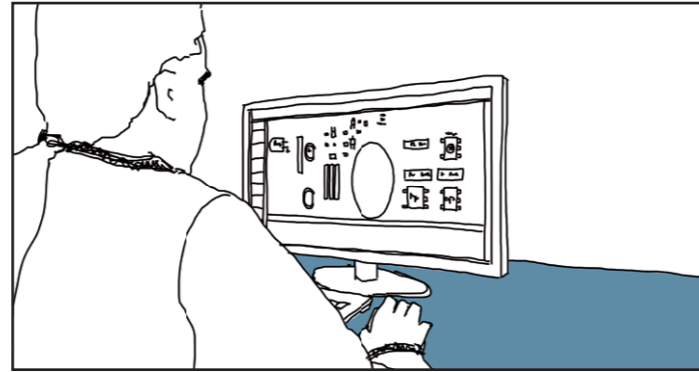
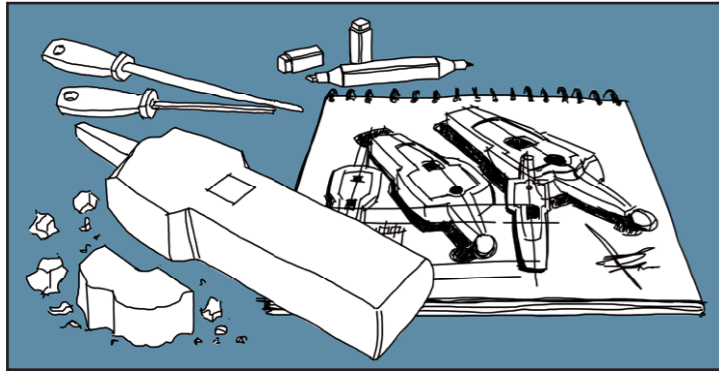
Electronic, Mechanic
Detailed Development

Engineering Sample

Full Functional Mock-up

Testing According to Spe-
cification

Design Freeze



Product Development

Industrial Design I

Industrial Design II

Detailed Development

Engineering Sample

2D Sketches and
Foam Models

Man-Machine-Interface
Definition

Functional Samples

Design 3D Data and Design
Mock-up

Interfaces
"Inside-Outside"

Process Owner
Product Lifecycle
Management

Involved
Customer
Product Manager
Development Team Leaders
Assigned Developers
Industrial Designer

Documents | Samples

Design Briefing
2D sketches
Foam Models
3D design data
Design mock-up if required
Functional blocks electronic engineering,
mechanical engineering
BOM electronic engineering
Schematics electronic engineering
Concept mechanical engineering
Functional samples electronic engineering,
mechanical engineering with test report
Definition of interfaces electronic, mechanic to housing
Product artwork (if design mock-up required)
Customer approval of Industrial Design

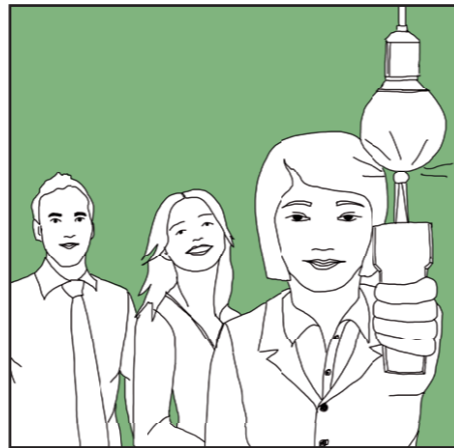
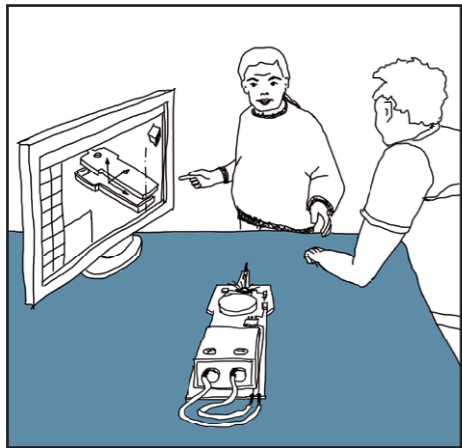
Product Development

Industrial Design I

Industrial Design II

Detailed Development

Engineering Sample



Housing Concept

Electronic, Mechanic
Detailed Development

Full Functional Mock-up

Testing According to
Specification

Design Freeze

Process Owner

Product Lifecycle
Management

Involved

Customer
Product Manager
Development Team Leaders
Assigned Developers
Test Management
Plant Management

Documents | Samples

Housing and tooling concept
Housing 3D data
PCB layout
Design Review of schematics, layout, 3D data
Updated BOM with item numbers, supplier, lead time
All component datasheets and drawings available
Updated product costs
Firmware (80% status)
Final design functional mechanical parts
Product artwork (latest, can be done in ID design II)
Engineering sample with test report
Design review report
Customer Approval of Engineering sample

Transfer to Production

Engineering Pilot

5-10 Samples with
Out-of-tool Parts and
Final Electronics

Pre-Pilot

20-50 Pieces Assembled
with Final Production
Toolings

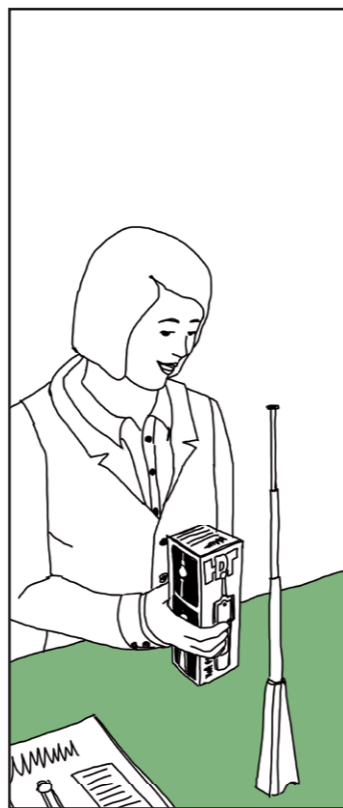
Pilot Run

100-200 Pieces Assembled
on Production Line

Mass Production

According to Customer
Order





Transfer to Production

Engineering Pilot

Pre-Pilot

Pilot Run

Mass Production

5-10 Samples with
of-tool Parts and
Electronics

Out-
Final

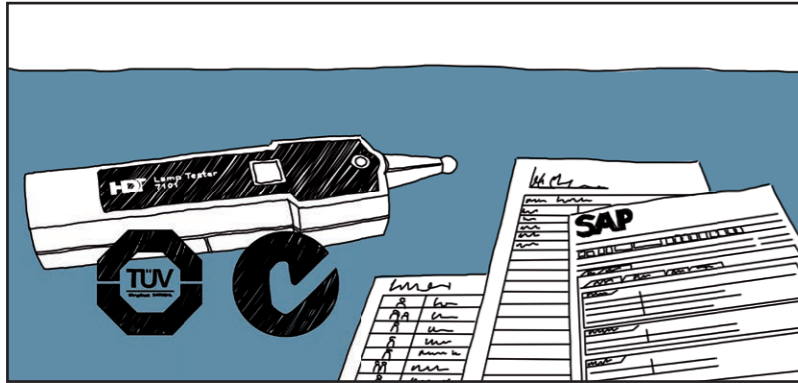
Process Owner
Product Lifecycle
Management

Involved

Customer
Product Manager
Responsible Accessories
Responsible Gift Box
Responsible User Manual
Development Team Leaders
Plant Management
Assigned Developers
Test Management
Administration
Purchasing
Production Engineering

Documents | Samples

Final product data electronic engineering,
electronic engineering
Final Bill of Material
Supplier set-up
Toolings
Risk release long lead time items
Engineering pilot samples with test report
Engineering pilot samples for certifying body, if ok
Gift box design
User manual document
Accessories samples
Customer approval of Engineering Pilot



Transfer to Production

Engineering Pilot

Pre-Pilot

Pilot Run

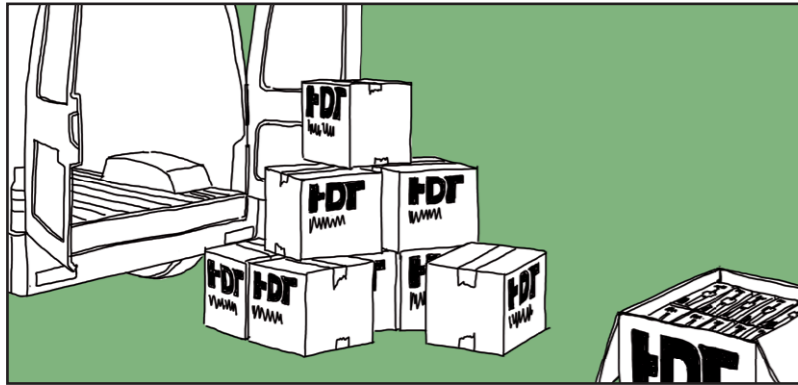
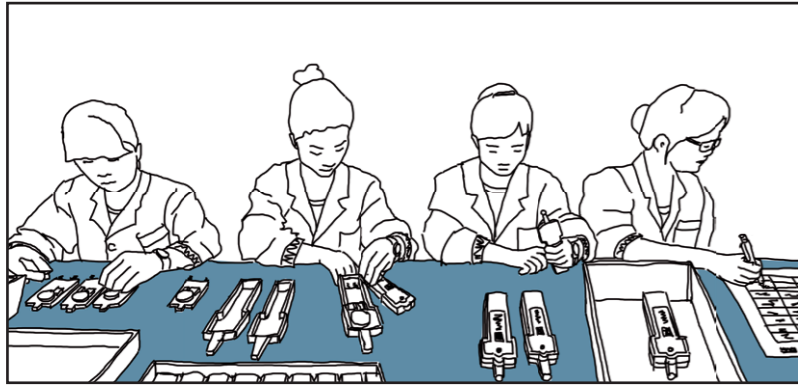
Mass Production

20-50 Pieces
Assembled with Final
Production Toolings

Process Owner
Product Lifecycle
Management

Involved
Customer
Sales
Product Manager
Plant Management
Assigned Developers
Test Management
Quality
Purchasing
Production Engineering
Cell Leader
Operators

Documents | Samples
Standard work
Visual management/ lean production documentation
Quality documentation (IQC, IPQ, FQC)
Production records
Test reports
Pre-Pilot Report
Customer purchase order
Pre-Pilot Samples
Logistic concept (carton box, labels...)
Customer approval of Pre-Pilot
Customer forecast for first production batches



Transfer to Production

Engineering Pilot

Pre-Pilot

Pilot Run

Mass Production

100-200 Pieces
Assembled on
Production Line

Process Owner

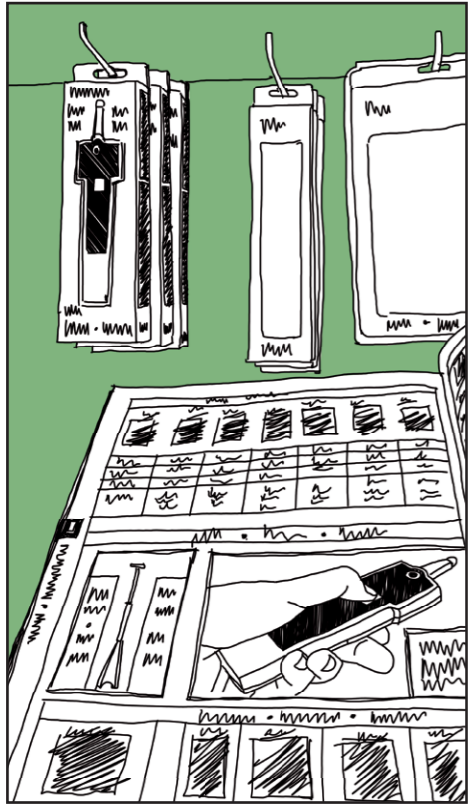
Supply Chain Management

Involved

Customer
Sales
Product Manager
Development Team Leaders
Plant Management
Quality
Purchasing
Production Engineering
Cell Leader
Operators

Documents | Samples

Customer purchase order
Production records
Shipping papers
Invoice
Pilot run goods
Customer approval of pilot run,
release of mass production



Transfer to Production

Engineering
Pilot

Pre-Pilot

Pilot Run

Mass
Production

According to
Customer Order

Market Success

Process Owner

Supply Chain Management

Involved

Customer
Sales
Production
Quality
Purchasing

Documents | Samples

Customer purchase order
Customer forecast
HDT order confirmation
Shipping documents
Goods
Invoice
Payment



www.tuv.com
ID 1000000000



Facts and figures

Full service provider of electric and electronic innovations

OEM portfolio, customer-specific products, contract manufacture

Part of the BEHA Group with over 40 years of experience in the development and manufacture of electronic products

Headquarters: Glottertal, Germany

Development team: 25

Total number of employees: over 150

Manufacturing sites: Glottertal, Germany (up to 1,000 units/year) and Dongguan, China (over 1,000 units/year)

ISO 9001 certified

Much more than contract development and manufacturing

“We are a family-owned enterprise that puts great emphasis on strong partnerships, reliability, quality and sustainability – and we are convinced that long-term cooperation results in better outcomes.

„Linking people and technology“ is our slogan; it reflects our actions, which are aimed towards developing innovative solutions that simplify the user’s work – as well as making your company more successful,” says Lars Christian Beha, managing director of HDT.

Hoover Dam Technology GmbH · www.hdt-electronic.com

In den Engematten 16 · 79286 Glottertal/Germany · Phone: +49 (0) 7684 907 200 · Fax: +49 (0) 7684 907 101 · E-Mail: sales@hdt-electronic.com

