
OTB Group

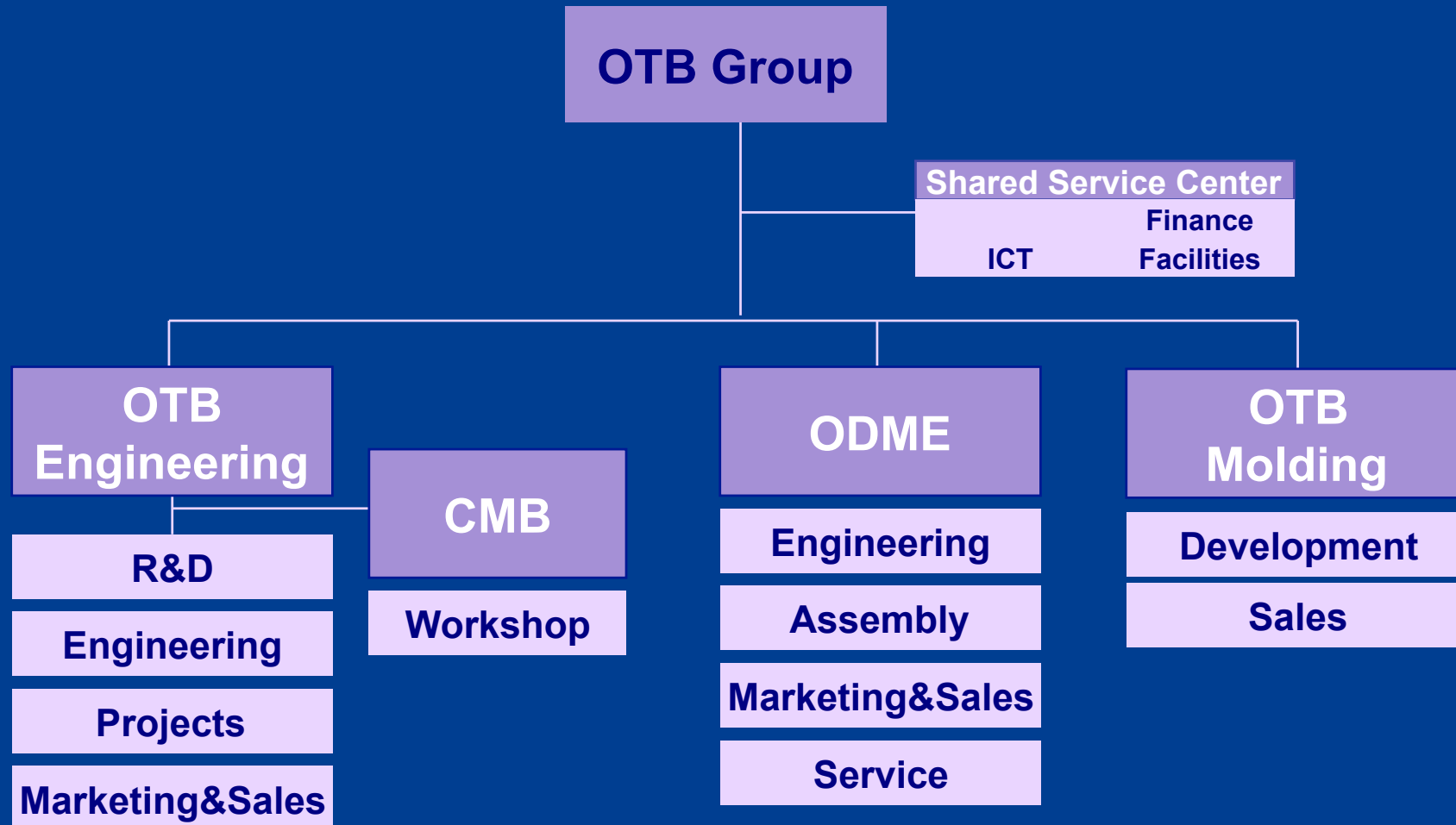
Ron Kok

President & CEO

Leo van Doorne

Exec. Vice President

The OTB Group



History of Ron Kok

- 1968: Started as plastics engineer at Krauss Maffei A.G.
- 1979: Engineer at Philips Plastic Factory (laserdisc/CD)
- 1982: Krauss Maffei Sales Office NL
- 1985: Started Rokoma B.V.
- 1987: First In-line production machine for CD replication MC. (OD&ME)
- 1991: First in-line Mastering equipment and take over of Optical Disc Mastering of PDO. (ODME)
- 1995: Sale of shares of ODME and Buy Out OTB Engineering B.V.
- 2001: Acquisition by OTB Group of Toolex activities (former ODME operations)



Optical Media

Optical Disc Manufacturing Equipment



History ODME

1976 Philips Research - Development of Optical Recording

1985 PDO - a Philips / Du Pont joint venture

1987 Philips ODM

OD&ME

1991

Acquisition of Philips ODM by OD&ME

ODME

1994

-----split off ----->

1997

Merger of ODME & Toolex Alpha

TOOLEX

2000

Start Newtoms / acquisition CMB

2001

Acquisition of Toolex by Newtoms

Newtoms

OTB Group

OTB
Engineering

CMB

ODME

part of the OTB Group

ODME Worldwide Locations



- ODME headquarters: Eindhoven, The Netherlands
- ODME Europe: Eindhoven, the Netherlands
- ODME Asia: Hong Kong
- ODME USA: Irvine CA, USA

Number of employees worldwide: 205

What is a CD ?



**BELONGS TO CATEGORY
OF OPTICAL MEDIA MEDIA**

**CONTAINS INFORMATION IN
A DIGITAL FORMAT**

**CAN BE READ BY DEVICE
CONTAINING A LASER**





MANY DIFFERENT FORMATS AND USES:

- CD AUDIO - MUSIC
- CD-ROM - COMPUTER SOFTWARE, DATA etc.
- CD-R - CAN BE RECORDED IN STANDARD PC
- DVD - HIGH DENSITY DISC (FULL LENGTH MOVIE ON ONE DISC)

What is a CD ?

Layers



DISC MADE UP FROM A NUMBER OF LAYERS

INKS (PRINTED)

PROTECTIVE LACQUER



REFLECTIVE ALUMINIUM

POLYCARBONATE

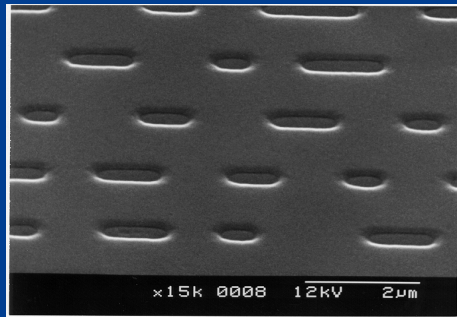
What is a CD ?

Pit size

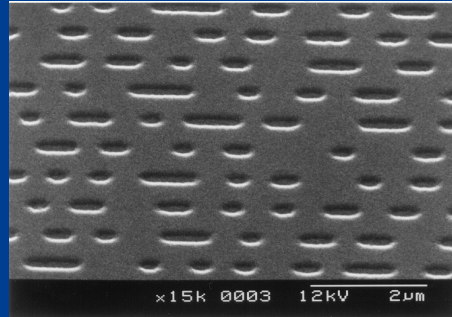


Difference between CD and DVD pit size

CD



DVD

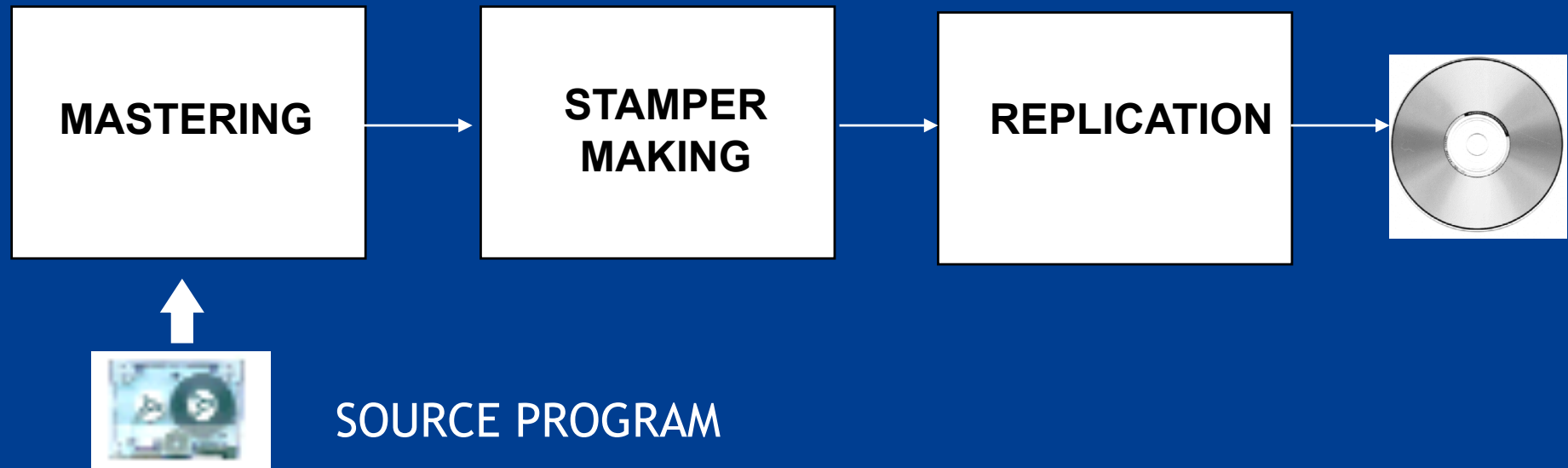


What is a CD ?

Processes

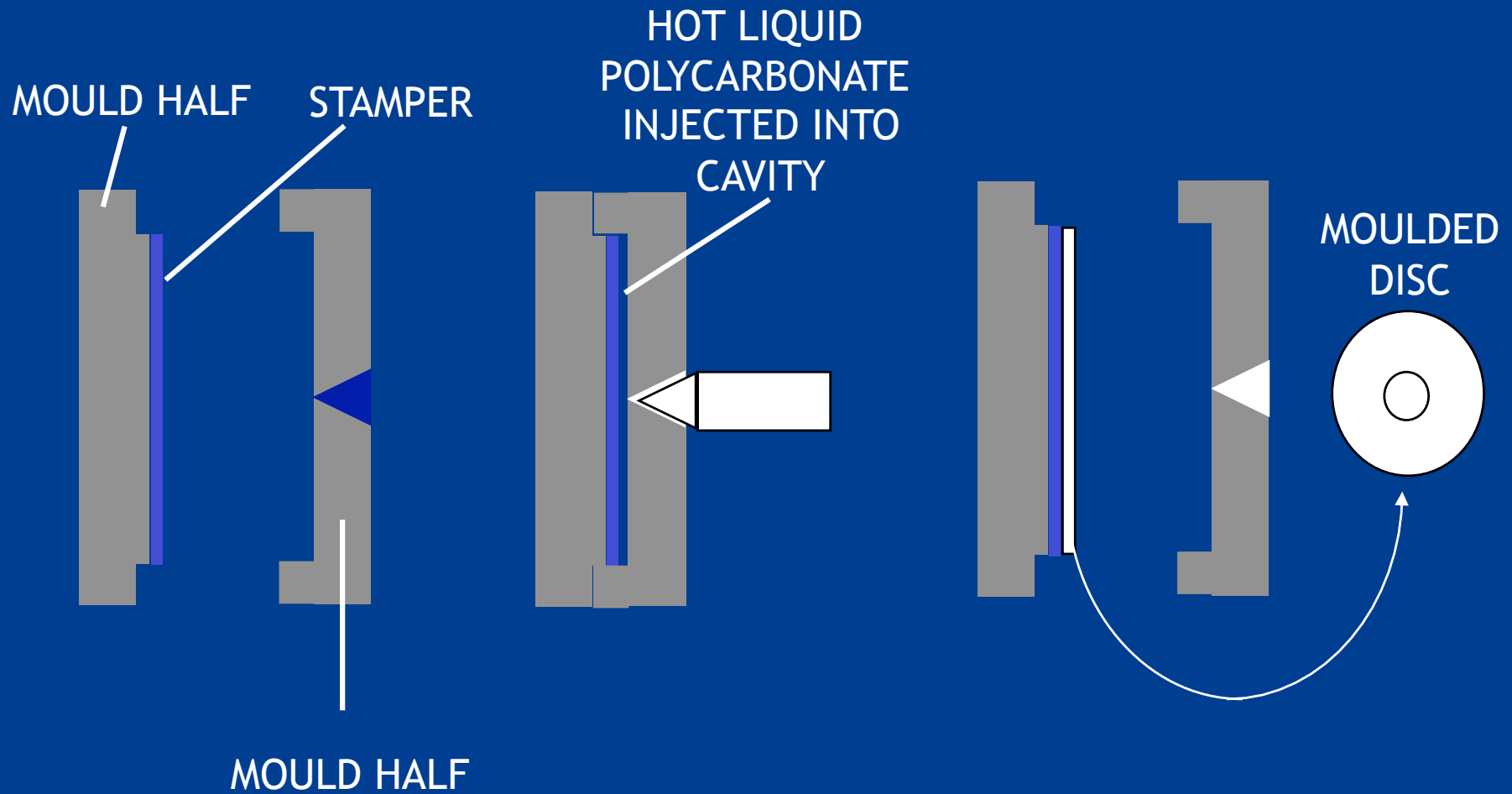


PRODUCTION OF A CD CAN BE CONSIDERED AS
THREE SEPARATE PROCESSES



What is a CD ?

Inj. molding

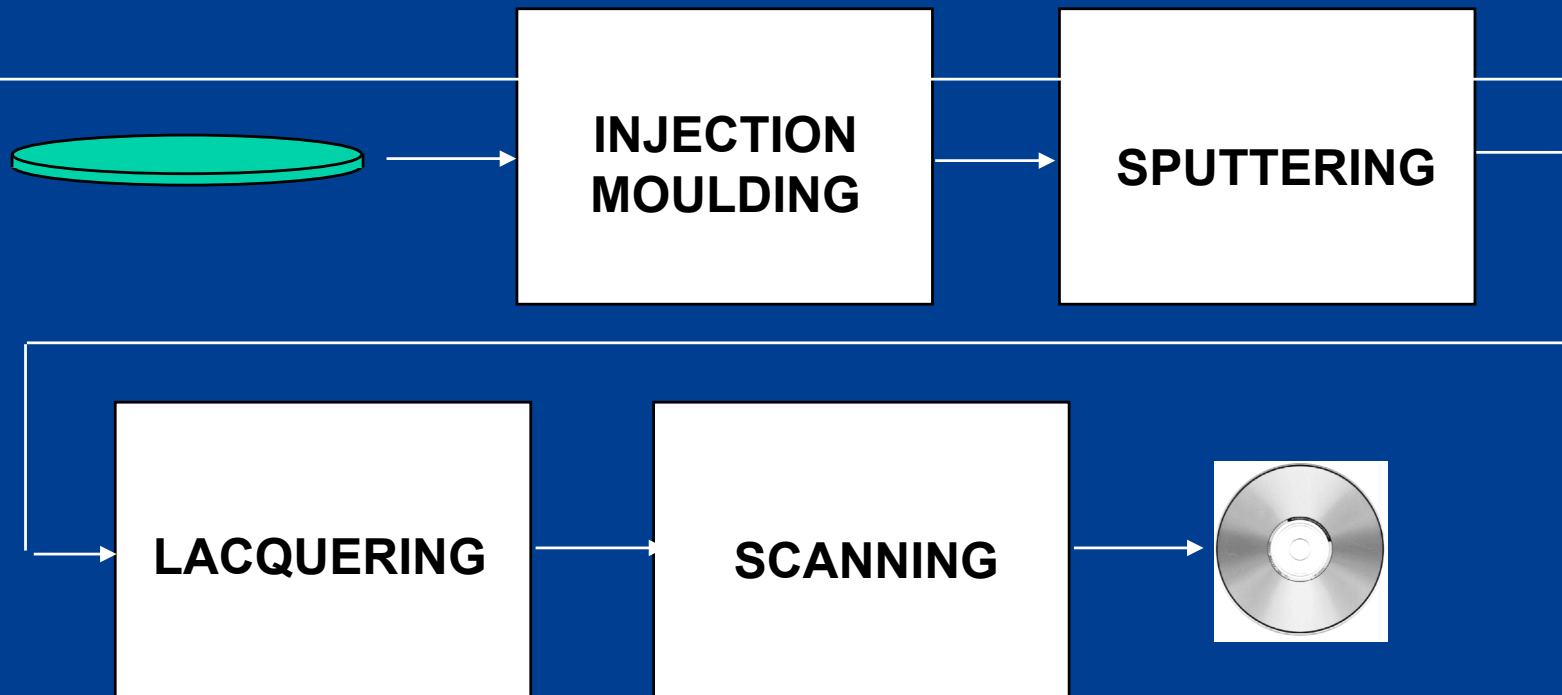


What is a CD ?

Replication

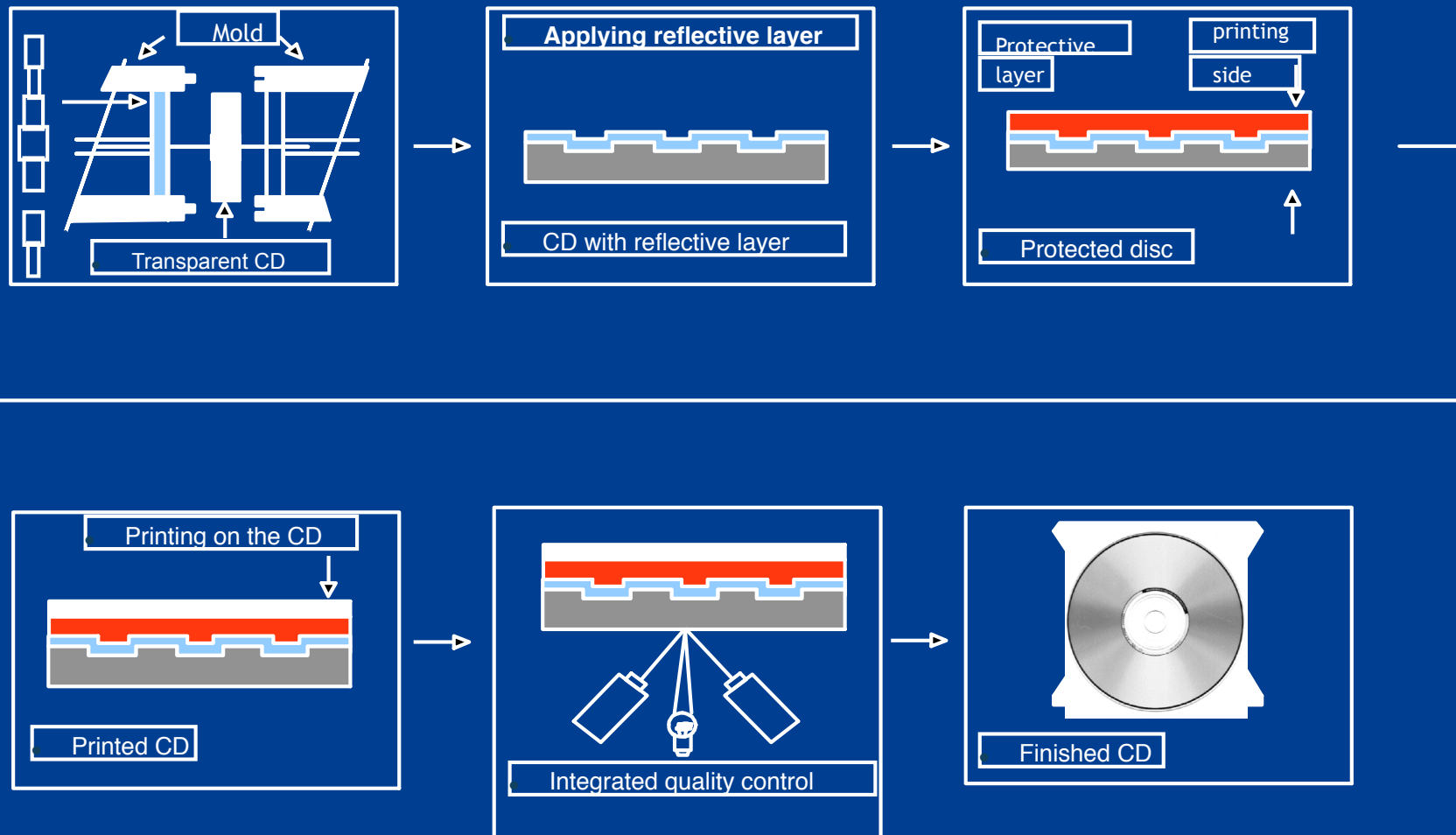


THE REPLICATION PROCESS CONSISTS OF A NUMBER OF SEPARATE PROCESS STEPS WHICH ARE EACH CARRIED OUT IN AN INDIVIDUAL UNIT WITHIN THE REPLICATION LINE



What is a CD ?

Replication



Product groups



- (Pre)mastering
- Pre-recorded Replication
- Recordable Replication
- RW Future

Mastering



AM200, Automated Mastering system

CD pre-recorded
DVD pre-recorded



DSR, Direct Stamper Recording

CD pre-recorded
DVD pre-recorded



Deep UV @257 Dual Beam Recorder

up to 27 GB
Recordable / Rewritable formats

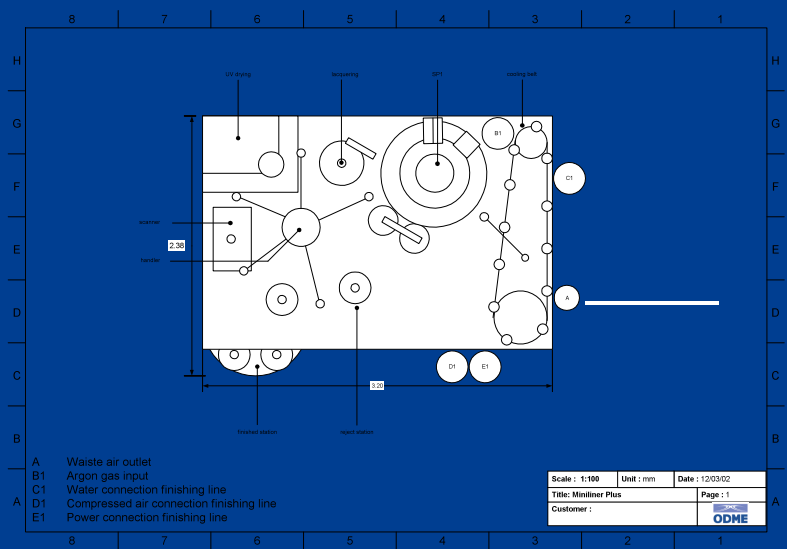
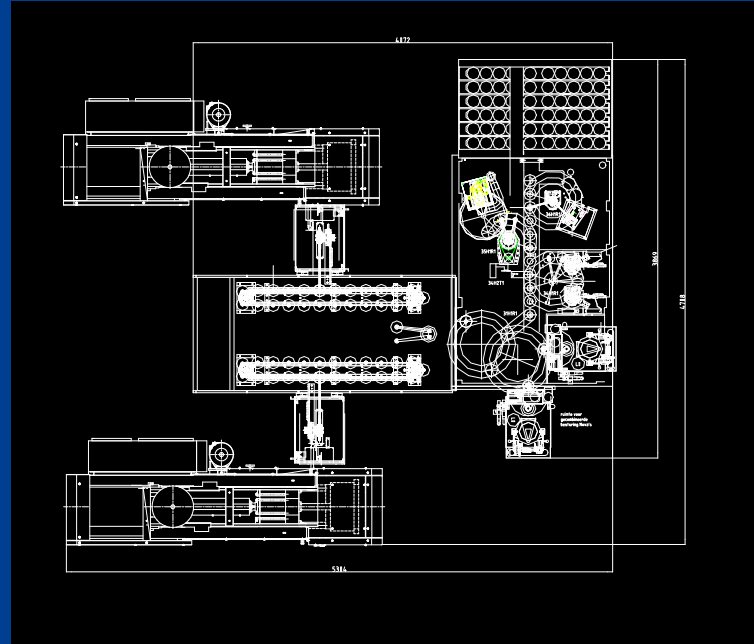
Pre-recorded Replication



the Dex
 CD
 DVD-5
 DVD-9



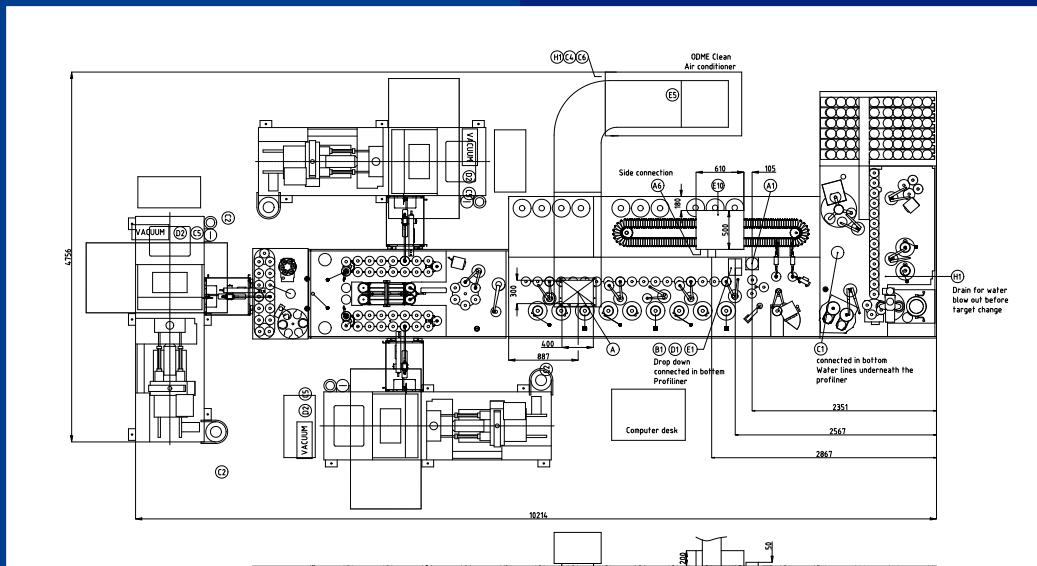
Miniliner Plus
 CD
 DVD-5



Recordable Replication



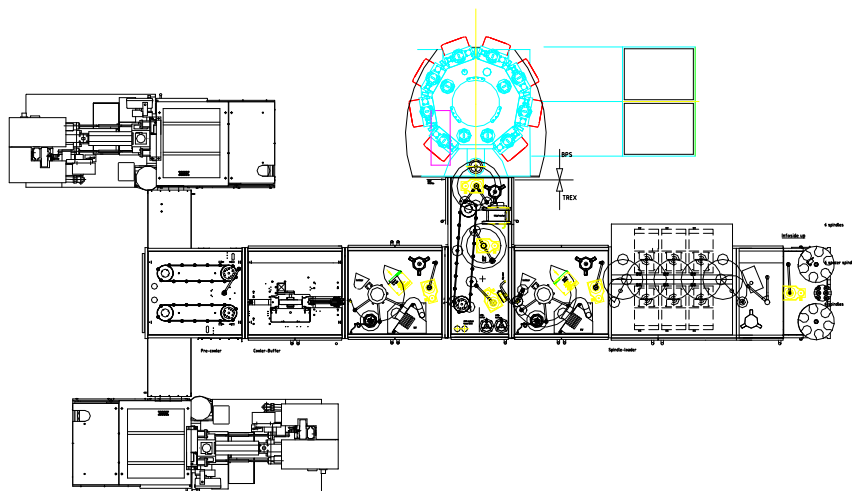
Profiliner
CD-R
DVD-R upgradeable



Rewritable Replication



Phaseliner
All rewritable formats



Key Factors for Success



Focus on core activities

Media Morphics - Mastering - Pre-recorded - Recordable / Rewritable

Process knowledge throughout the production chain

Mastering - Coating - Molding - Metallizing- Process Control

Knowledge sharing within the OTB Group

OTB Engineering - - ODME

Close relationships with technology leading companies for future technology

Philips - ITRI - Samsung- Pro-disc

Strong customer base

f.e. Sonopress - CINRAM - Warner - Pro-Disc - KODAK - Panasonic

OTB Engineering

- **Research department**

Venture research team



Proof of Principle



Prototype



- **Engineering department**



Production machine

History of OTB Engineering



- 1994 OTB Engineering B.V. as subsidiary of ODME
- 1997 Johnson & Johnson, Vistakon: disposable contact lenses
- 1999 Shell International Renewables: solar cells
- 2000 Development of a DVD replication line
- 2000 OTB Engineering acquires CMB
- 2000 Start-up of Newtoms BV: assembly and sales of the DVD replication line *the DEX*
- 2001 Acquisition of the TOOLEX Mastering and Recordable / Rewritable activities

2000 Award: 2nd in the Dutch Technology Fast Fifty (Deloitte & Touche)

Mission



OTB Engineering is a leading company in the design, engineering, development and manufacturing of **inline production equipment**

OTB realizes major cost reductions

- inline concepts
- tailor made solutions
- breakthrough technologies

Partnerships



Major Customers a.o.

- Shell
- Philips
- Johnson & Johnson
- ODME

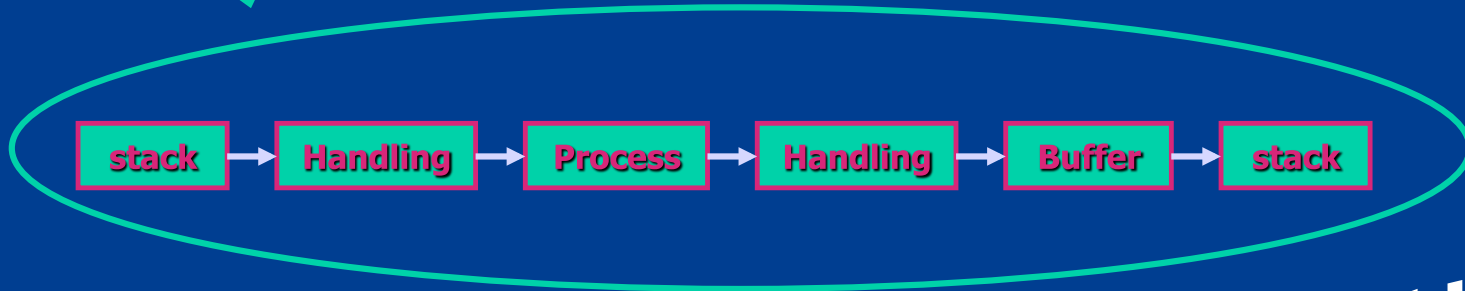
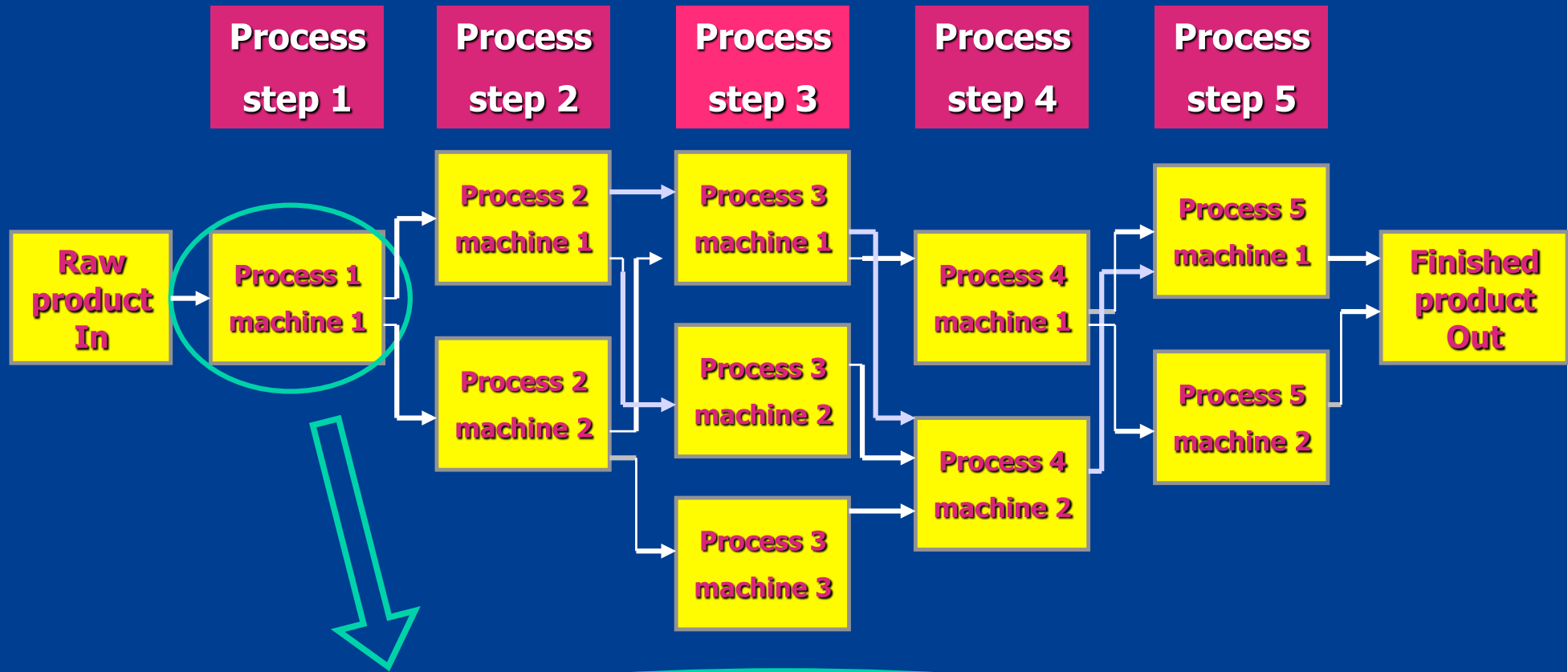
Institutes

- TU Eindhoven
- TNO
- ECN

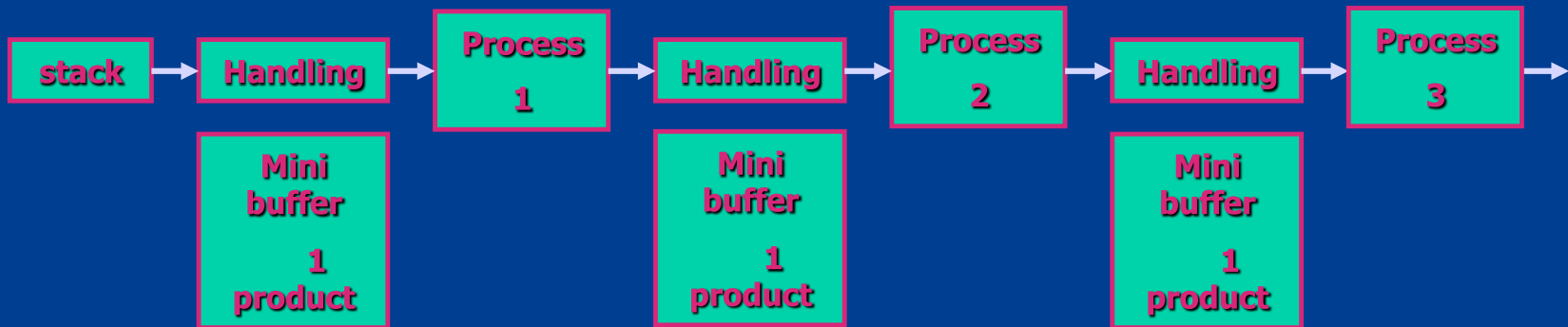
- Research breakthrough technologies
 application know how
- Development prototyping
- Engineering process integration and
 inline concepts
- Project Management supply chain
 management

- Inline Concepts
- Injection Molding
- Thin Film Deposition
- Micro and Nano Structures

Normal Batch Production



Inline Production concept



Inline Production

- Integration in one machine
- Minimizing process steps
- Smart controller with integrated feed back

Results:

- Reduced cycle times
- Increased yields
- Improved product quality
- Reduced investments
- Less operators

Cost leadership

Investments high tech manufacturer

Batch Production:

- 20% building construction
- 30% clean room facilities
- 20% handling equipment
- 30% process equipment

Inline Production:

- 80% equipment costs
- 20% building & facilities

To achieve this, it needs:

1. Out of the box thinking
2. A known process
3. A launching customer
4. Financing

- Invention total inline production of CD's
Manufacturing cost per CD from € 3.5 to € 0.2
- Photo resist mastering
- Inline production disposable contact lenses
- Inline production solar cells
- Inline production flat panel displays (PolyLED)

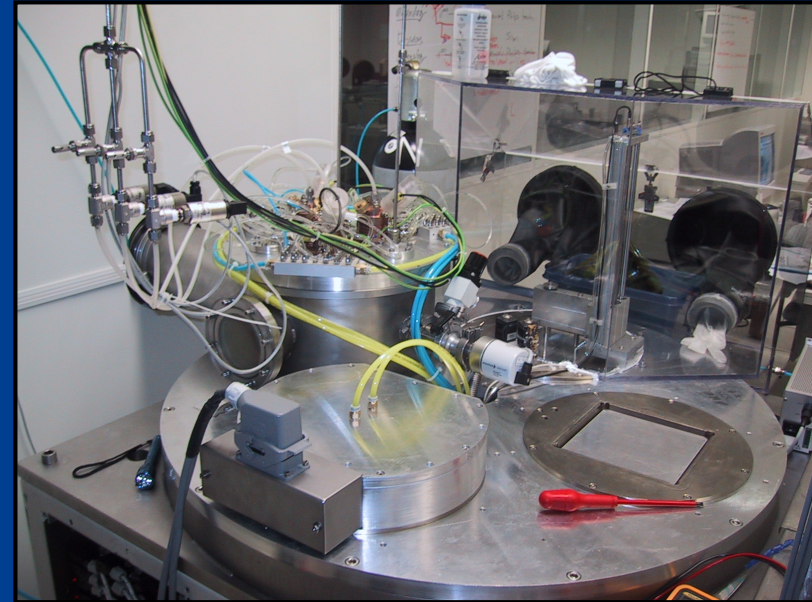
Disposable Contact Lenses

- Johnson & Johnson
- Fully automated in line production machine: 4000 lenses packed per hour
- Installed base: 15



PECVD

- Shell, Philips
- Inline concept for thin film deposition
- Deposition rates of $50 \mu / \text{min}$
- Combination of heating and sputtering possible



Ophthalmic Lenses

- Johnson & Johnson
- Fully automated in line production platform: 360 lenses/hour
- New prescription technologies in NewRx



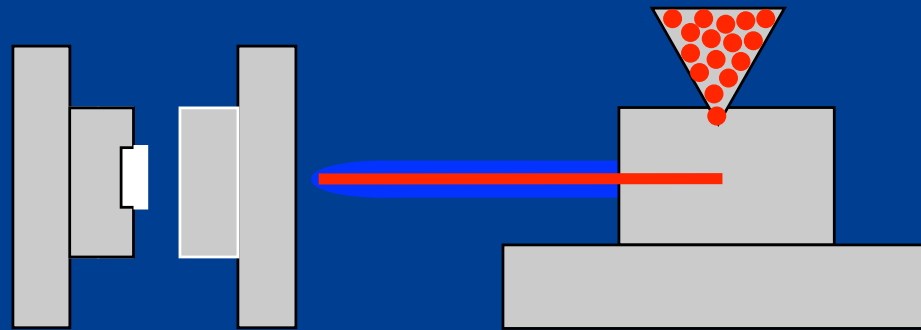
Photo Voltaic Solar Cells

- Shell
- Fully automated production platform:
1200 PV Solar cells
/hour

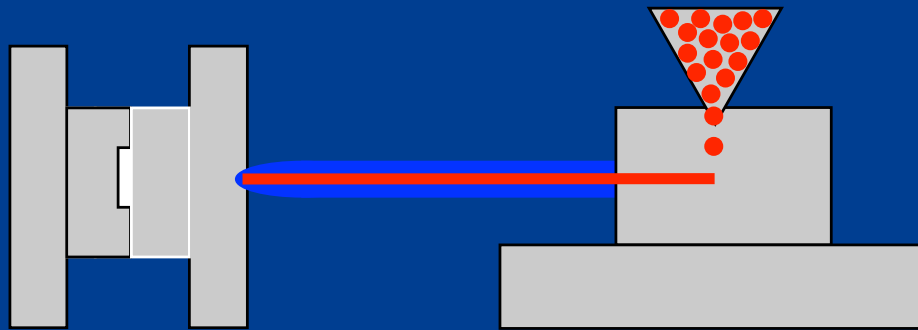


Conventional VS the OTB e-clamp

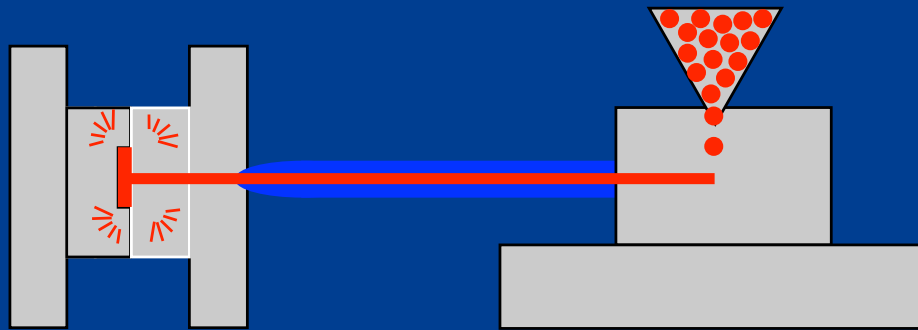
Conventional Injection Molding



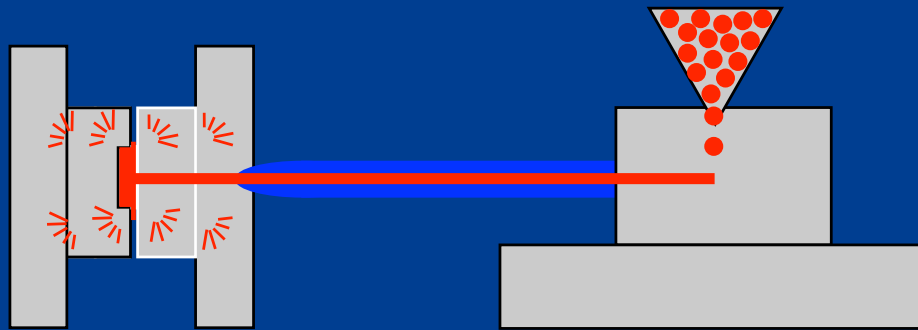
Conventional Injection Molding



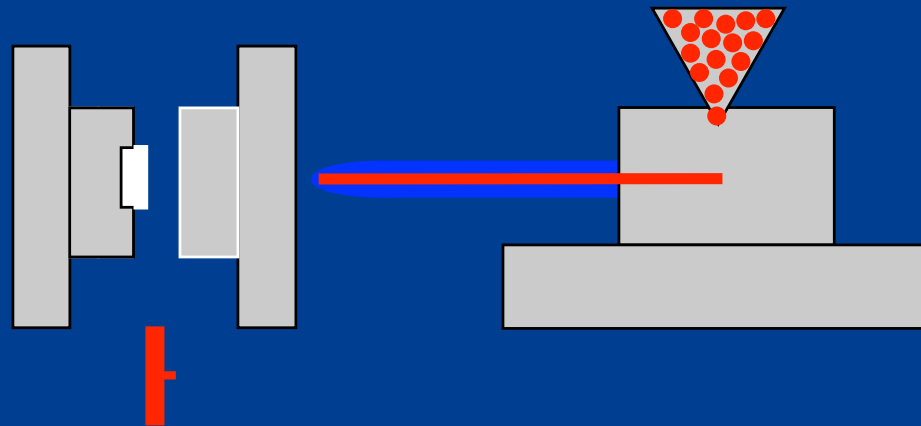
Conventional Injection Molding



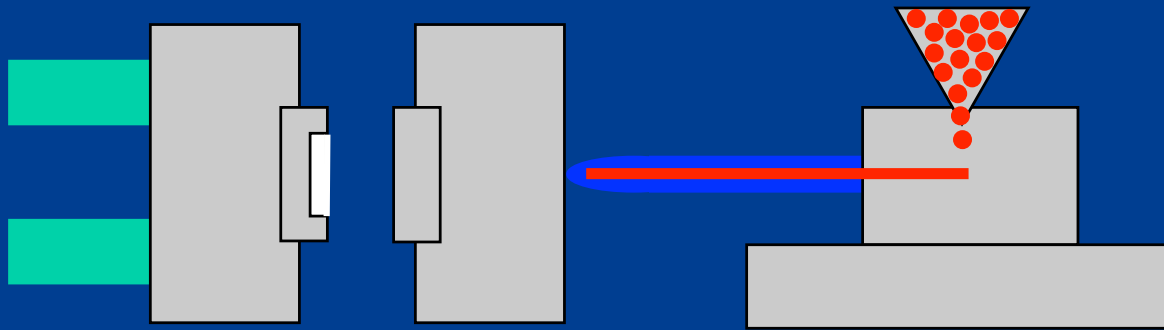
Conventional Injection Molding



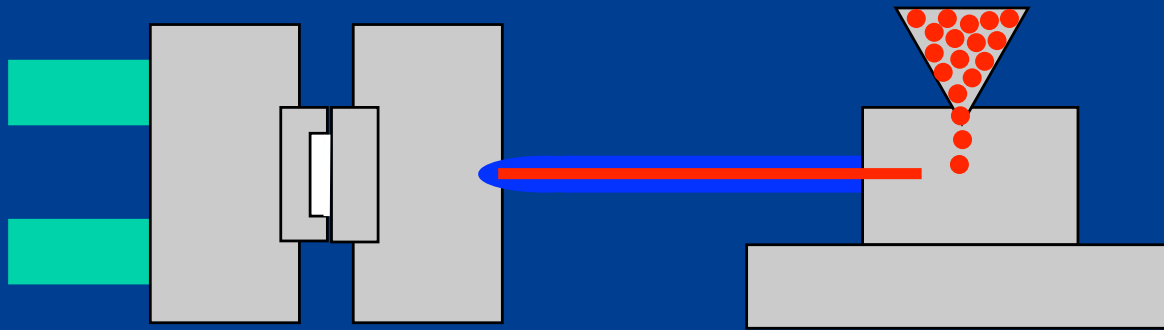
Conventional Injection Molding



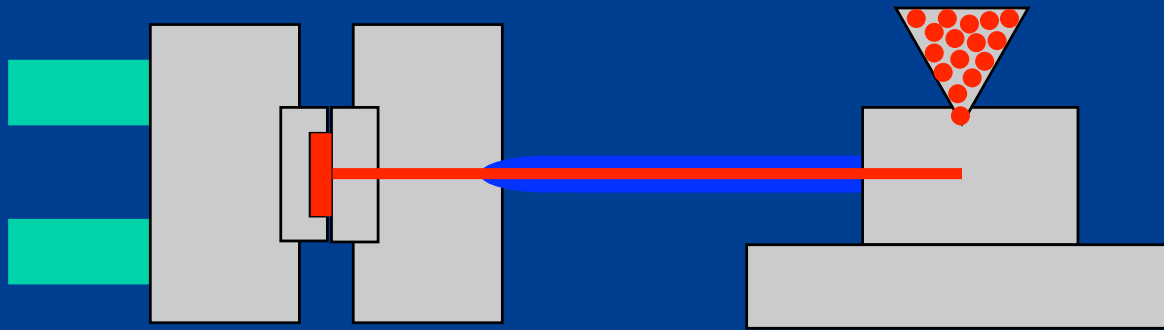
OTB E-clamp



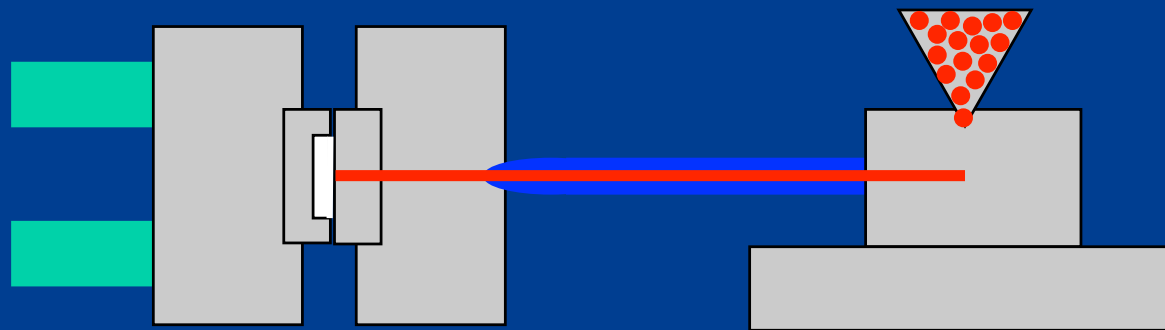
OTB E-clamp



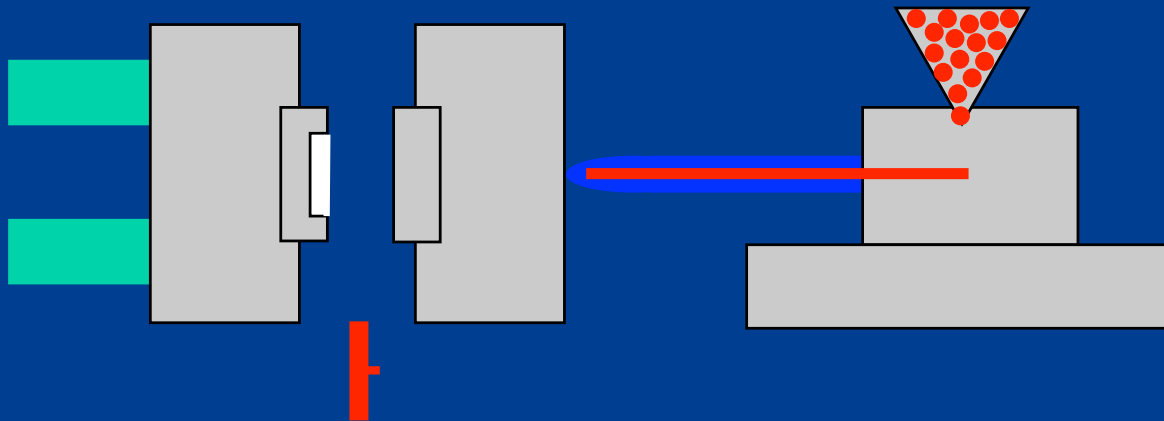
OTB E-clamp



OTB E-clamp

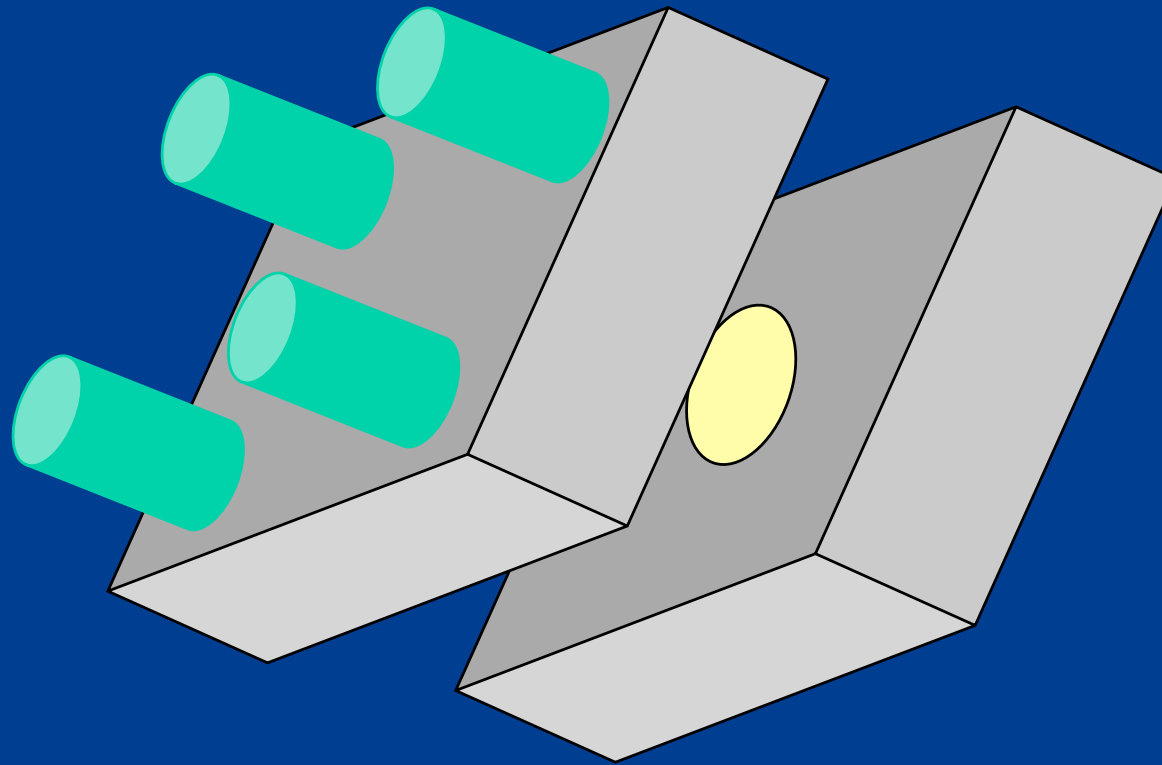


OTB E-clamp



OTB E-clamp

4 servomotors
control stamper deviations
from shot to shot



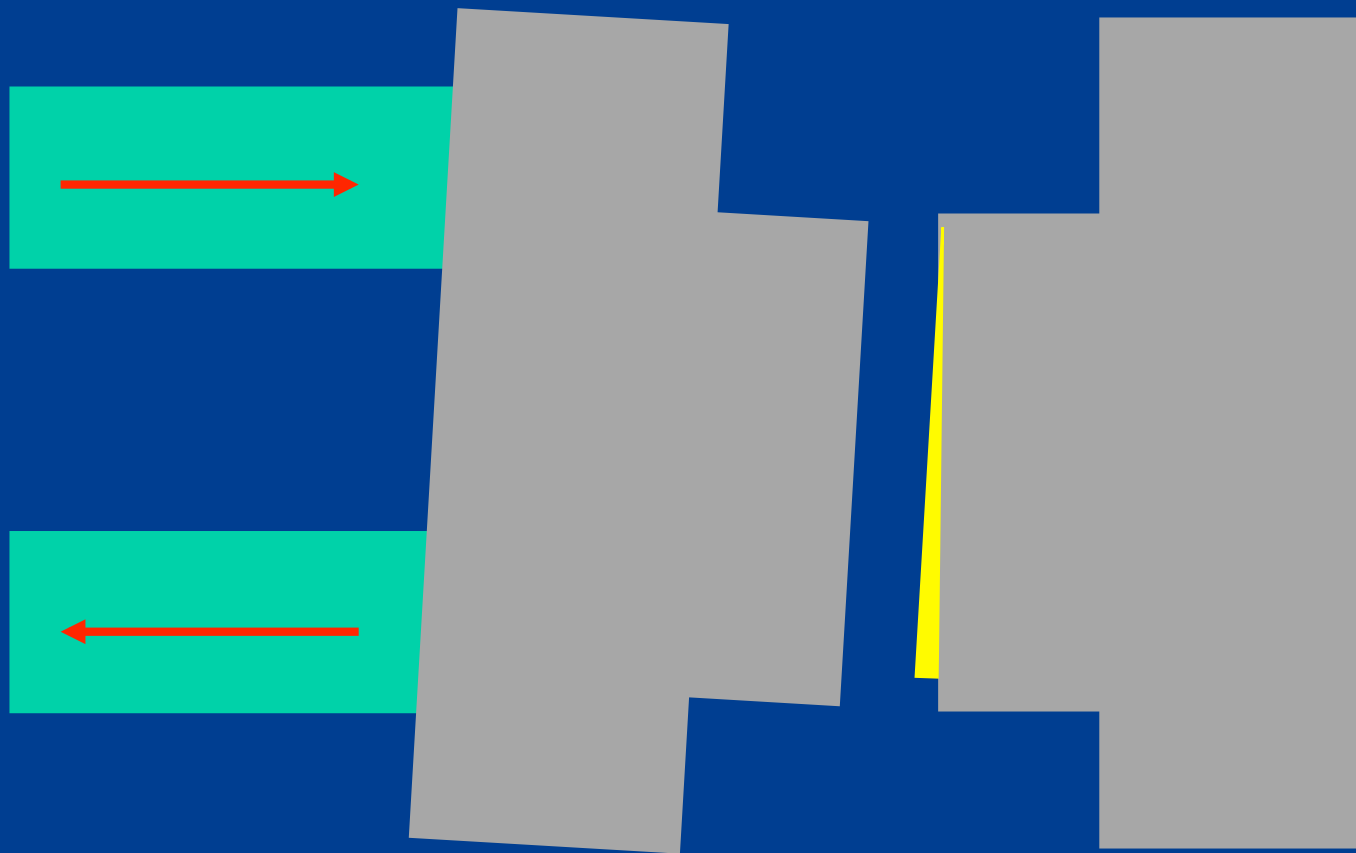
OTB E-clamp

Shot 1

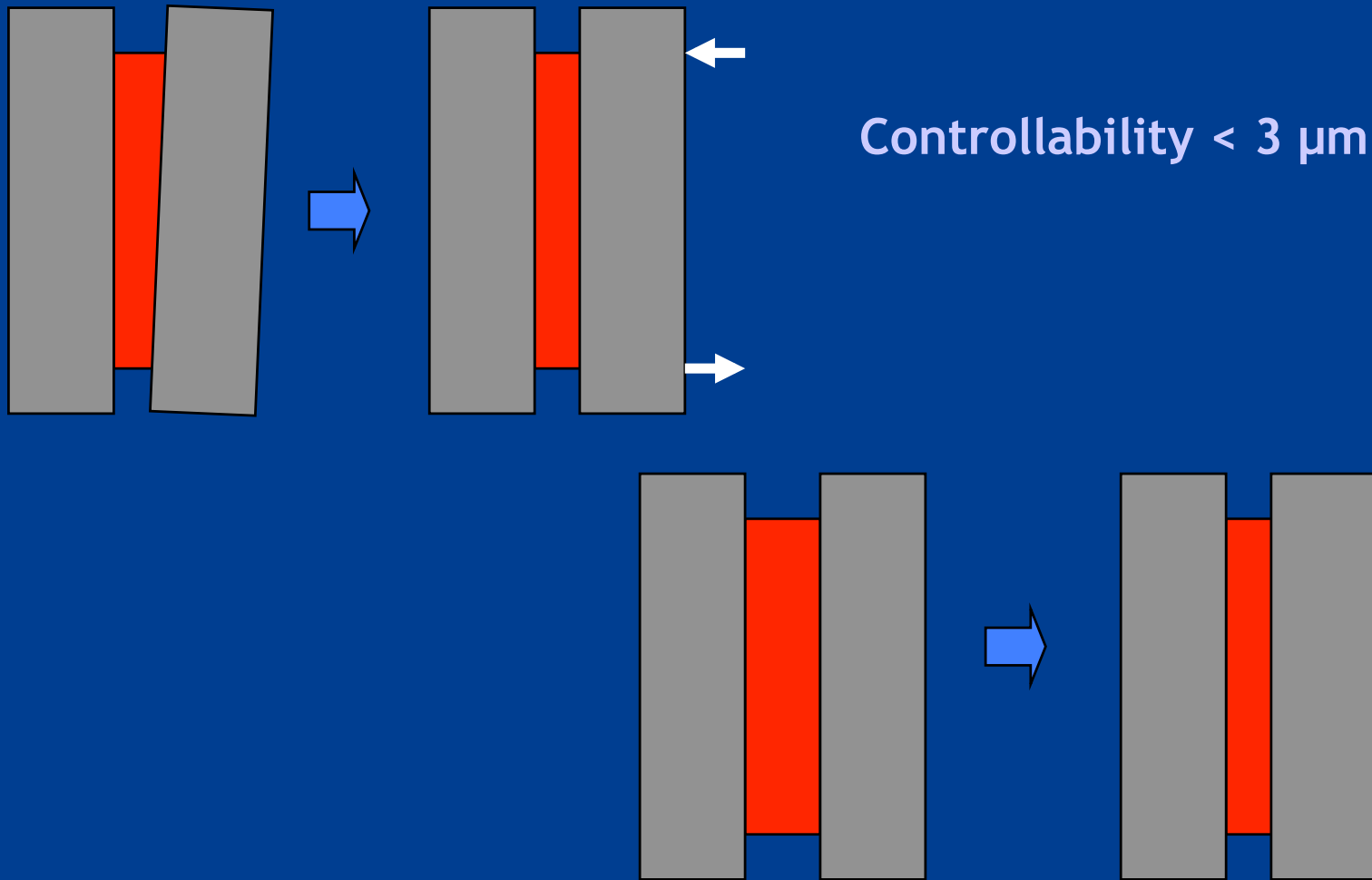


OTB E-clamp

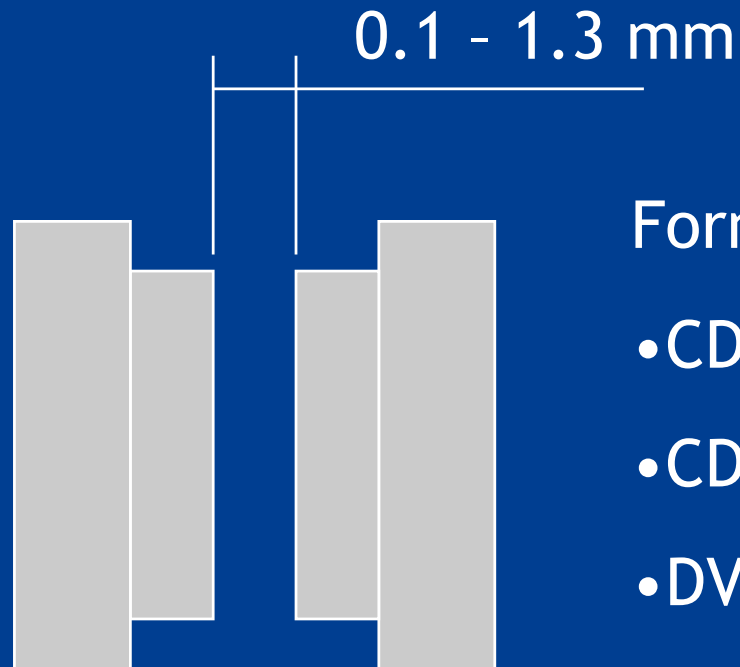
Shot 2



Substrate flatness + thickness controllable



Multi Format

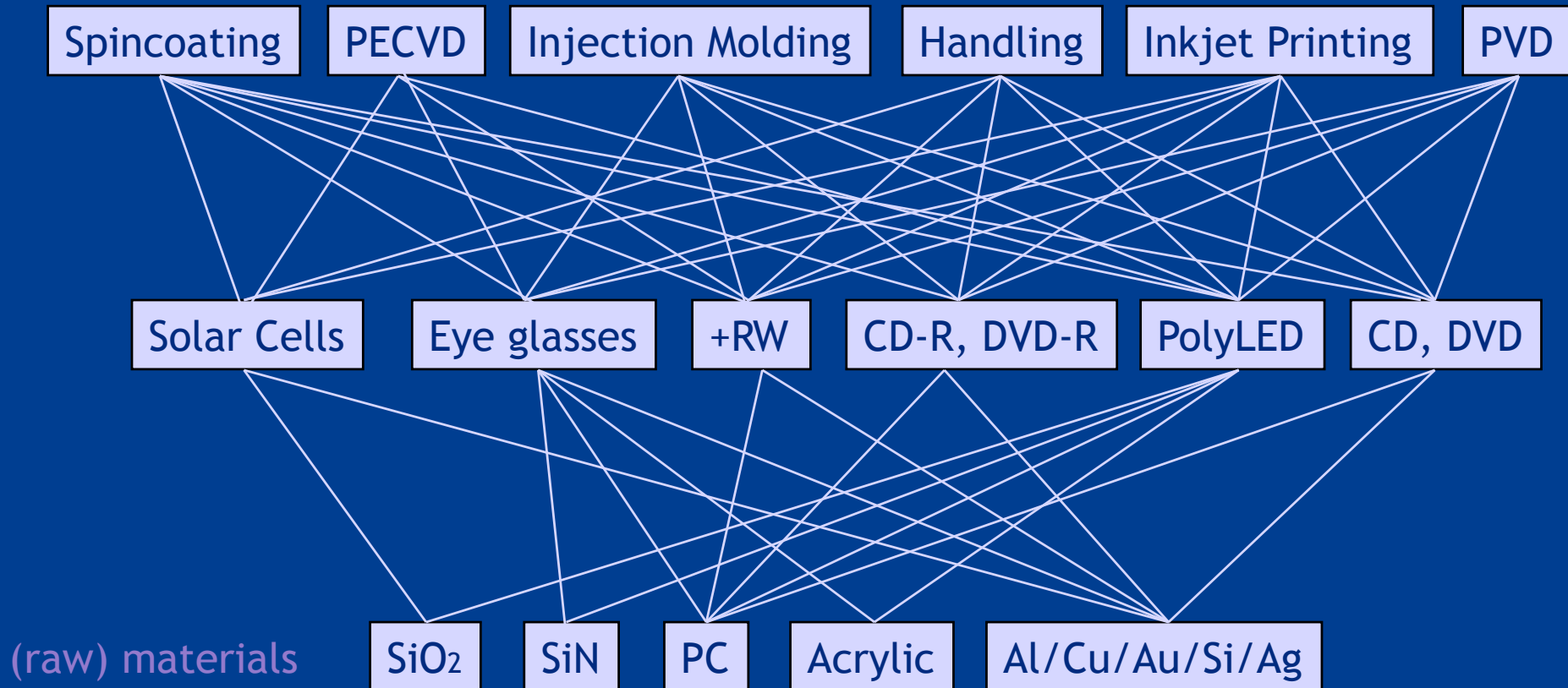


Formats ;

- CD 1.1 mm
- CD-R 1.2 mm
- DVD 5/9 0.575 mm
- DVD-R 0.575 mm
- DVR (Blu Ray Disc) 0.1 - 1.00 mm

- Injection molding
- PECVD
- Bonding
- Sputtering
- Mastering
- Substrate handling
- Spin coating

Shared Technologies for OTB Group Group is more than sum of its parts !



Thank you