



# BLULINE III

Production System for  
High Quality Blu-ray  
Discs with up to  
100 Gigabyte Storage

## BLULINE III

*Ready for Triple Layer Blu-ray Discs*

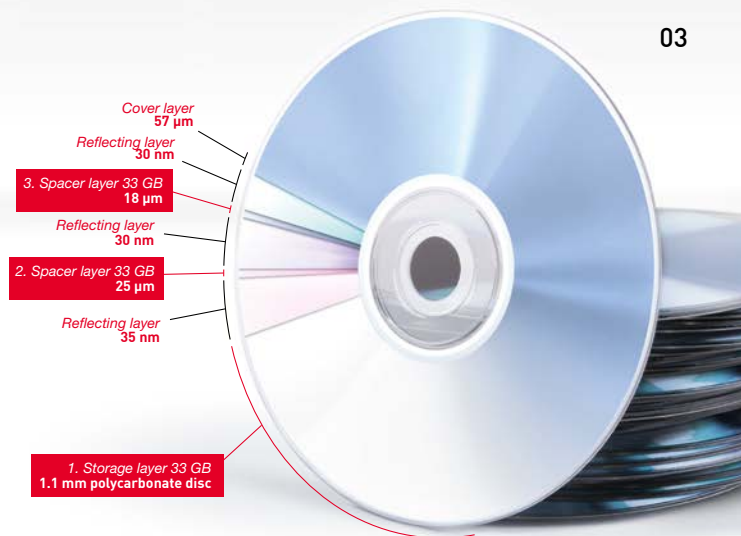
SINGULUS TECHNOLOGIES developed a new replication line under the product name BLULINE III for the manufacturing of triple layer Blu-ray Discs with a storage capacity of 100 Gigabyte. The new production equipment by SINGULUS TECHNOLOGIES enables the production of next generation optical discs on the basis of the current BLULINE II machines for dual layer Blu-ray Discs. SINGULUS TECHNOLOGIES has already a large number of production lines at over 30 replicators around the globe and experience in the field of Blu-ray production. This goes back to its early, exclusive partnership with the format developer Sony in 2005.

Just in time for the market introduction of the new ultra high definition television technology (UHD), SINGULUS TECHNOLOGIES completed the development of the production technology for the new triple layer Blu-ray Discs. The new generation of high definition television provides four times the resolution (3,840 x 2,160 pixels) of HDTV. The further advancement of today's Blu-ray Discs, the triple layer Blu-ray Discs with 100 Gigabyte storage capacity, is the preferred playback medium for the new UHD technology. With the realization of a new and specifically designed data compression method for the ultra high definition technology, the storage volume per information layer can be increased from 25 GB to 33 GB. The Blu-ray Disc Association decided in May 2015 for a new, global standard.



*BLULINE III*

*Production System  
for High Quality  
Blu-ray Discs with  
100 Gigabyte Storage*

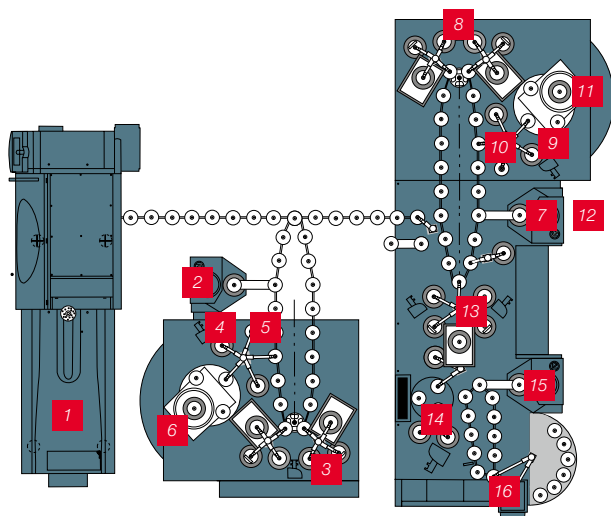


## SINGULUS TECHNOLOGIES

*develops and optimizes innovative machine formats and production machines for the new Blu-ray format*

### The following features characterize the BLULINE III concept:

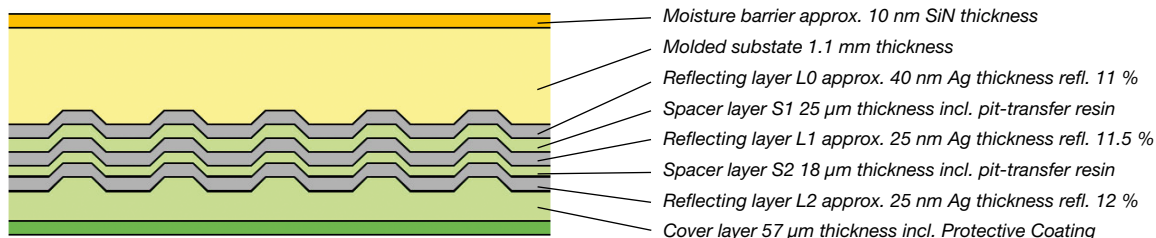
- Dedicated to production of triple layer Blu-ray Discs
- Based on proven BLULINE II concept
- Using SINGULUS wet embossing technology
- Highly integrated design
- All production steps included
- Thickness Measurement Device (TMD) for metallized layers with close loop control
- Inline-Scanner for spacer layer and cover layer measuring with close loop control
- High productivity, high uptime
- Clear structured disc flow
- Automated handling of BD through all production steps
- Minimum space required



The most common technology for creating an additional information layer on a substrate surface is the wet-embossing process. The benefit of the wet-embossing process is that it provides a fine pit geometry and therefore generates a flawless electrical signal. The Layer 1 wet-embossing station is the key unit of the dual-layer application. This unit is built with a 4-position turntable and one embossing head. The Layer 1 stamper is mounted onto the top side of the embossing head. It is supported by vacuum and a mechanical stamper holder. The disc is loaded onto a quartz glass underneath the embossing head and the L1 Nickel stamper structures are embossed into the pit transfer resin and cured with UV light.

### The complete process consists of the following production steps:

1. Molding BD L0 for BD TL
2. Metallization L0 (~40 nm)
3. Base-Resin S1 (22 μm)
4. Pit-Resin S1 (3 μm)
5. Pre-Curing S1
6. Wet-Embossing L1
7. Metallization L1 (~25 nm)
8. Base-Resin S2 (15 μm)
9. Pit-Resin S2 (3 μm)
10. Pre-Curing S2
11. Wet-Embossing L2
12. Metallization L2 (~25 nm)
13. Cover-Resin (54 μm)
14. Hardcoat-Resin (3 μm)
15. Barrier Layer (~10 nm)
16. Final Inspection





#### Headquarters

##### **SINGULUS TECHNOLOGIES AG**

Hanauer Landstrasse 103  
D - 63796 Kahl, Germany  
Tel. +49 6188 440-0  
Fax +49 6188 440-1130  
sales@singulus.de  
www.singulus.de

#### Production Site for Wet Processing Systems

##### **SINGULUS TECHNOLOGIES AG**

Branch Office Fuerstenfeldbruck  
Fraunhoferstr. 9  
82256 Fuerstenfeldbruck, Germany  
Tel. +49 8141 3600-0  
Fax +49 8141 3600-2100  
sales@singulus.de

#### Subsidiaries

##### China

##### **SINGULUS TECHNOLOGIES CHINA**

Room B412-413,  
No. 1400 Jiangchang Road,  
Jingan District, Shanghai, China  
Zip Code: 200072  
Tel. +86 13916990710

Contact: Greens Pan  
Tel. +86 13822138376  
greens.pan@singulus.com.cn

Contact: Michael Han  
Tel. +86 13917382315  
michael.han@singulus.cn

##### France

##### **SINGULUS TECHNOLOGIES FRANCE S.A.R.L.**

Tel. +33 3 893111-29  
singulus@club-internet.fr

##### Latin America

##### **SINGULUS TECHNOLOGIES LATIN AMERICA LTDA.**

Tel. +55 1121 6524-10  
sales@singulus.com.br

##### Singapore

##### **SINGULUS TECHNOLOGIES ASIA PACIFIC PTE LTD.**

Tel. +65 674 119-12  
sales@singulus.com.sg

##### Taiwan

##### **SINGULUS TECHNOLOGIES TAIWAN LTD.**

Tel. +886 2 8692-6996  
sales@singulus.com.tw

##### United States, Mexico and Canada

##### **SINGULUS TECHNOLOGIES INC.**

Tel. +1 860 68380-00  
sales@singulus.com

THIN FILM  
DEPOSITION

SURFACE  
ENGINEERING

THERMAL  
PROCESSING

WET  
CHEMICAL

#### **SINGULUS TECHNOLOGIES – Innovations for New Technologies**

*SINGULUS TECHNOLOGIES develops and assembles innovative machines and systems for efficient and resource-saving production processes, which are used worldwide in the solar, semiconductor, medical technology, consumer goods and data storage.*

*The company's core competencies include various processes of coating technology, surface treatment and wet-chemical and thermal production processes.*