

THE PURSUIT OF PERFECTION IN BLOWN FILM

More than 60 Years of Innovation and Continuous Improvement



HOSOKAWA ALPINE

Process technologies for tomorrow.



**»» HOW TO ACHIEVE
EFFICIENT PROFITABLE
FILM PRODUCTION?**

Dear Film Producer,

continuous innovation describes Hosokawa Alpine's "Pursuit of Perfection" in blown film processing. The market for high performance packaging films has grown steadily the past several decades and growth is projected well into the future. Processors and converters will require more complex and sophisticated film structures to meet the markets exacting and demanding requirements. Energy reduction, material reduction, recycling, sustainability are just a few of the opportunities that lie ahead.

With over 60 years of experience, Hosokawa Alpine has been delivering high performance blown film lines that meet and exceed our customers' expectations. From our new and modern machining and assembly centers, to our multi-line test centers we are here to provide the most efficient and profitable blown film lines in the industry.

Therefore we also consider the huge topic "digitalization". For years we keep the finger on the pulse. Our line operation system ExVis saves process data, combines important information and generates valuable know how for a save and stable production. This is the future - and with our machines you are perfectly prepared.



With best wishes
Dr. Holger Niemeier
Executive Vice President

**»» INNOVATIVE TECHNOLOGY
FROM HOSOKAWA ALPINE.**

WE ARE YOUR PARTNER FOR FILM PRODUCTION:

»» SERVING YOUR MARKETS.



» FOOD



» CONSTRUCTION



» PHARMACEUTICAL



» HYGIENE



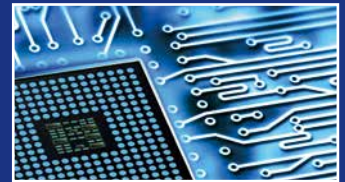
» LOGISTICS



» DOMESTIC



» SHIPPING



» ELECTRONICS



» MEDICAL



» AGRICULTURAL



» AUTOMOTIVE ENGINEERING



» CHEMICAL

»» FOR A WIDE VARIETY OF APPLICATIONS.

» AGRICULTURAL FILM

» ANIMAL FEED PACKAGING

» CARRIER BAGS

» COMPRESSION PACKAGING

» CONFECTIONERY PACKAGING

» CONSTRUCTION FILM

» FILM FOR FROZEN GOODS

» FREEZER BAGS

» FRESH PRODUCE PACKAGING

» FRUIT AND VEGETABLE BAGS

» GOODS BAGS

» HEAVY CARGO SACKS

» INDUSTRIAL FILM

» LAMINATING FILM

» LIDDING FILM

» MEAT / POULTRY PACKAGING

» MEDICAL FILM

» MILK FILM

» NAPPY LININGS

» NEWSPAPER FILM

» PACKAGING FOR BAKERY PRODUCTS

» PROTECTIVE FILM

» REFUSE BAGS / SACKS

» SHIPPING ENVELOPES

» SHRINK HOODS

» STRETCH HOODS

» WRAPPING

» TAILORED FILM PROPERTIES FOR YOUR APPLICATION.



» RE-SEALABLE PACKAGING

Perfect seal-and-peel properties, good oxygen and aroma barrier



» FOOD POUCH

Ideal fill and seal properties, good stiffness and attractive appearance



» GARMENT BAG

Attractive transparency, good sealability



» CARRIER BAG

Excellent tear strength and perforation resistance



» NAPPY LININGS

(oriented) breathable hygienic film with high moisture vapour transmission rate (WVTR)



» COMPRESSION PACKAGING

High resilience and perforation resistance, good sealability



» STRETCH HOOD

Excellent tear strength and perforation resistance combined with good elasticity



» LID FILM AND THERMOFORMING FILM

Top oxygen and aroma barrier, very high stiffness and sealability



» CEREAL FILM

High barrier against moisture, ideal filling and sealing properties



» HEAVY DUTY SACK

High stiffness and sealability, low tendency to creep



» FINE SHRINK FILM

Ideal shrink properties, premium-quality appearance, very high stiffness and sealability



» AIR-PILLOW PACKAGING

Very high stiffness, strength and sealability



»» WHAT IS THE RECIPE FOR PERFECT FILM QUALITY?

Meet Hosokawa Alpine.

**HOSOKAWA ALPINE BLOWN FILM LINES
PATENTED TECHNOLOGY MADE
IN GERMANY.**

The secret of Alpine's blown film lines lies in our continuous improvement over several decades resulting in patented technology that is engineered and manufactured in Germany. Partnership with Hosokawa Alpine means you are associated with the world's leader

in the manufacture of premium blown film equipment. With millions of dollars invested in research and development, and a world class manufacturing facility Hosokawa Alpine is your recipe for success and profitability in your blown film plants.



» TAILOR-MADE SOLUTIONS AND IDEAL COMPONENTS.

PERFECT FILM QUALITY AND ROLL CONFORMITY.

Hosokawa Alpine is your single source for blown film equipment, from pellet feeding to film winders, mono to 11-layers.

The heart of Alpine film lines is the patented X-die. The innovative and compact design has the shortest purging times and fastest job changes

in the industry. The patented TRIO system finally makes machine direction orientation a cost effective option for enhancing film properties.





» WHAT MAKES A BLOWN FILM LINE PERFECT?

We develop as many line configurations as we have customers.

**DESIGNED FOR YOUR APPLICATION
MANUFACTURED TO YOUR EXACTING
SPECIFICATIONS.**

Visit our 1,000 sqm test center and you will have access to state-of-the-art blown film lines to develop your specific formulations

with your raw material supplier and our process expertise. Develop enhanced film properties on our TRIO machine direction orientation system. Whatever your process requirements are you will have the opportunity to find solutions at our test center.



» QUALITY AND EFFICIENT RIGHT DOWN TO THE SMALLEST DETAIL.

A PARTNER YOU CAN DEPEND ON

Design, engineering, development, production and commissioning – we offer you the complete package from one source. From initial trials to final production you will have a partner you can lean on every step of the way. You will find

solutions to your film needs and the needs of your customers.



» WHY HOSOKAWA ALPINE?

More than sixty successful years in the blown film market are not a coincidence but the result of a philosophy and a commitment to excellence.

GERMAN CRAFTSMANSHIP

We are proud of our 115 years of growth and development, and we are especially proud of our single location over all those years here in Augsburg. Our Bavarian heritage provides us with highly qualified specialists, a solid infrastructure of people and companies that enrich our company. These are perfect conditions for innovative developments and sustainable production.

WE TRUST IN OUR APPRENTICES

Approximately 10% of our permanent staff are apprentices. We pass on elementary skills to the next generation early in their career to create an environment where they can become skilled professionals and experts in their fields.



» BECAUSE EXPERIENCE AND CONSISTENCY PAYS OFF.

WE TAP INTO SYNERGIES

We have long years of experience in machine engineering. We constantly develop new production methods and invest in leading-edge manufacturing techniques. We tap into synergies with other divisions to make certain we manufacture our blown film equipment to the highest level of quality. In addition to Hosokawa Alpine blown film lines we are also the largest supplier of powder processing equipment in the world.

WE CULTIVATE LONG-TERM CUSTOMER RELATIONS

Quality is the result of consistency, both technical and personal consistency. Many of our customers have been with us for decades. This special relationship is the product of mutual trust and respect developed over years of a successful partnership.

3-layer line at our test centre in Augsburg/Germany



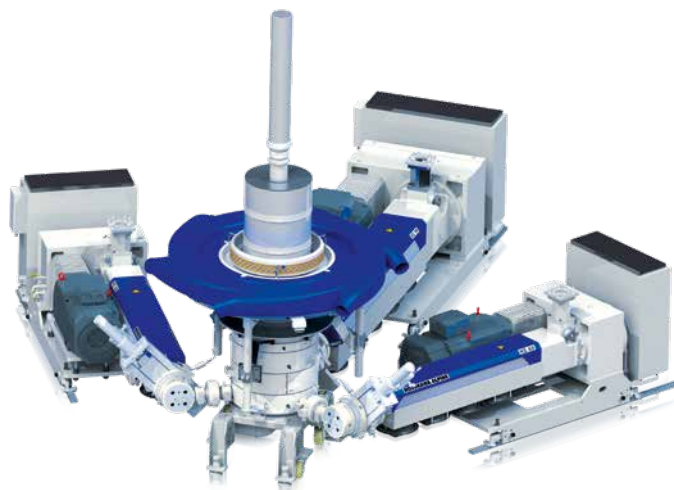
Recipe

	LLDPE + LOPE	LOPE + EPE	LLDPE + LDPE
Gauge [µm]	10.0	30.0	10.0
Gauge total [µm]	60		
Profile [% 2-Sigma]	2.1		
Layflat [mm]	2222		
Throughput [kg/h]	803		
Die Diameter [mm]	500		
Nip [m/min]	64.9		

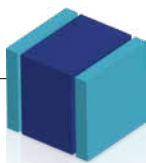
MONO AND 3-LAYER LINES

Your introduction to premium-quality film applications.

Hosokawa Alpine has been producing high quality mono-layer film lines since the early 1960's. Today we continue to improve this technology and manufacture many mono lines every year. We recently introduced our Dual Spiral K-2-die and newest generation barrier screws for optimum melt quality and performance.



› Our 3-layer lines can process all raw materials for blown film



EXAMPLE 3-LAYER FILM

FINE SHRINK FILM

› **Thickness:** 35 µm

› **Layer Distribution:** › **Raw materials:**

A	20 %	80 % LLDPE + 20 % LDPE
B	60 %	80 % LDPE + 20 % EPE
C	20 %	80 % LLDPE + 20 % LDPE

- › easy to extrude, high output rate
- › exceptional impact and tear strength and puncture resistance performance
- › very good balance between stiffness and optical properties

RELIABLE, PROVEN, EFFICIENT: HOSOKAWA ALPINE 3-LAYER BLOWN FILM LINES.

Alpine has a long successful track record in delivering highly profitable 3-layer co-extrusion lines. These lines have been an industry standard

for several decades. Today the introduction of X-Die technology has changed the game! Elimination of port lines, tighter gauge tolerances, quick job-changes, and the fastest purging all have combined to make Alpine's 3-layer X-die the most profitable die in blown film.



›› As innovative line manufacturer for the production of high-quality film, we enjoy the high regard of our customers all over the world.

Josef Greisel, Dipl.-Ing. (FH),
Manager Test Center



MULTI-LAYER FILMS 5 TO 11 LAYERS

Premium technology for tomorrow's performance films.

Multi-layer flexible packaging films are in demand around the globe and require speciality barrier extrusion lines. These products prevent the permeation of oxygen, nitrogen, carbon dioxide and water vapor. They also protect the aromas and flavors of the finished product. Barrier films are produced on 5-, 7-, 9- or 11-layer lines – the more layers the more options for you to engineer and tailor your film products, while saving raw material costs.

Benefits of our multi-layer lines:

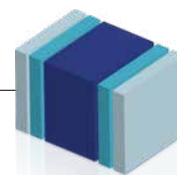
- Various material combination options
- Lower product costs
- Versatile production options
- Better efficiency

5-LAYER BLOWN FILM LINES. TAKING THREE LAYER FILMS TO THE NEXT LEVEL.

Hosokawa Alpine's introduced the advantages of a 5-layer line producing 3-layer films at K 2010. Producing 3-layer films on 5-layer lines improves film performance and reduces material costs. Alpine also offers the 5-layer as a barrier film line and a "Wide Range" to produce both PE films and barrier films.

7- AND 9-LAYER BLOWN FILM LINES: HIGH BARRIER FILM PRODUCTION FOR HIGHLY COMPLEX REQUIREMENTS.

Hosokawa Alpine's 7- and 9-layer co-extrusion lines provide you many options to compete in the challenging requirements for high barrier films made from PA, EVOH. These lines are also suitable for the production of film with asymmetric layers. Curling and tubing effects can be compensated for in the water bath.



EXAMPLE 5-LAYER FILM

LAMINATION FILM

➤ **Thickness:** 40 µm

➤ **Layer Distribution:** ➤ **Raw materials:**

A	22 %	80 % mLLDPE + 20 % mPE
B	9 %	100 % mLLDPE
C	38 %	100 % LDPE
D	9 %	100 % mLLDPE
E	22 %	80 % mLLDPE + 20 % mPE

- exceptional impact and tear strength and puncture resistance
- perfect optical properties
- good hot seal and hot tack properties (for high output rates)

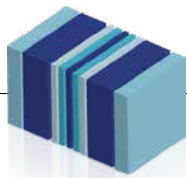


» 2



» 3

» **1,3** Production of 40 µm laminating film on a 11-layer line. » **2** Film for compression package produced on a 5-layer line prior to inline orientation.



**EXAMPLE
9-LAYER FILM**

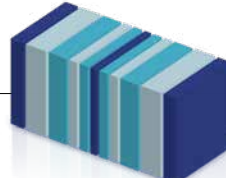
LAMINATION FILM
(HIGH-BARRIER FILM)

» **Thickness:** 30 µm

» **Layer Distribution:** » **Raw materials:**

A	13 %	90 % mLLDPE + 10 % LDPE
B	25 %	80 % LLDPE + 20 % LDPE
C	5 %	100 % Tie
D	5 %	100 % PA 6.66
E	4 %	100 % EVOH 32 %
F	5 %	100 % PA 6.66
G	5 %	100 % Tie
H	25 %	80 % LLDPE + 20 % LDPE
I	13 %	90 % mLLDPE + 10 % LDPE

- » exceptional impact, tear strength, and puncture resistance
- » high barrier provided by the EVOH-PA-Polyolefin composite layer
- » lamination properties with low seal initiation temperature



**EXAMPLE
11-LAYER FILM**

LAMINATION FILM
(ULTRA-HIGH-BARRIER FILM)

» **Thickness:** 40 µm

» **Layer Distribution:** » **Raw materials:**

A	8 %	100 % mLLDPE
B	16 %	100 % LLDPE
C	14 %	100 % HDPE
D	5 %	100 % Tie
E	5 %	100 % PA 6.66
F	4 %	100 % EVOH 32 %
G	5 %	100 % PA 6.66
H	5 %	100 % Tie
I	14 %	100 % HDPE
J	16 %	100 % LLDPE
K	8 %	100 % mLLDPE

- » high barrier provided by the EVOH-PA-Polyolefin composite layer
- » stiffness and extra water vapor barrier by HDP
- » cost- and performance optimized sealing layer by additional layers

11-LAYER BLOWN FILM LINES

Where 7- and 9-layer composites reach their limits, Hosokawa Alpine's 11-layer technology opens up completely new options. Thanks to our continuous advancement and the use of state-of-the-art production methods, we were able to develop the 11-layer die head of the X-Series – a new milestone on the way to modern film production.

With our 11-layer line you can produce a wide range of innovative film structures, e.g. for complex food packaging. Downgauging, the versatile and intelligent combination of different functional layers also reduces production costs. The highest savings, however, can be realised by replacing laminated structures with extruded composites, as costly and time-consuming downstream processing is no longer necessary.

HOSOKAWA ALPINE BLOWN FILM LINES

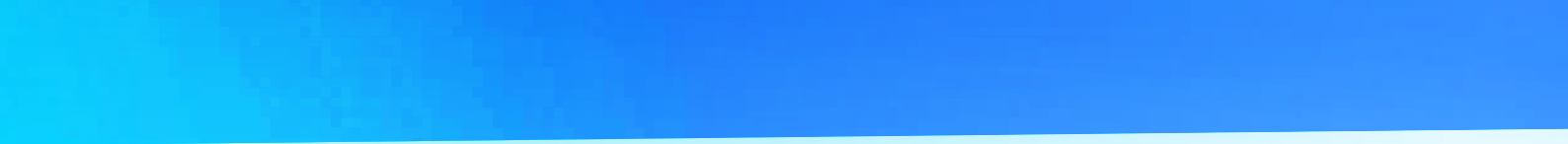
We have film quality down to the X.

	› Components/Process	› Abbreviation
1	Material feeding	AMC
2	Material metering	AMD
3	Extruder	HXS
4	Screen changer with connections	ASC, HSC, MSC
5	X-Die head	BF, TBF, FBF, SBF, NBF, EBF
6	Cooling ring	AEC
7	Profile control	POS
8	Internal bubble cooling	AIC, IBC, BDC
9	Calibration basket	ACB
10	Profile gauge sensor	PMS
11	Film take-off	AON
12	Web centre guide	ACG
13	Pre-treatment	ACT
14	Pre-take-off	VA
15	Winder	AWS, AWD
16	Shaft extraction system	ASE
17	Process visualisation	ExVis

COMPLETE PRODUCT OFFERINGS FOR YOUR SPECIFIC APPLICATION.

You know the properties of the film you produce. We know the perfect line configuration. Specified formulation, required film properties or a particular film format – we will combine your expertise with our professional intelligence to configure your tailor-made blown film line. From the extruder right through to the film winder, from 1 to 11 layers.







HIGH-PERFORMANCE EXTRUDERS

Cost-efficient film production.

- > 1 Space-saving arrangement of Smartbox extruders.
- > 2 Hydraulic screen changer HSC.
- > 3 Discontinuous metering with ABM batch system.

Hosokawa Alpine's HXS-Series of high-performance grooved feed extruders with smart-box technology are efficient and available in smooth bore and grooved feed designs. The series includes 50, 65, 75, 90, 105, 120 and 135 mm extruders and are all available as mono or multi-layer extruders. Alpine's high-performance barrier screws include a variety of low or high shear designs, and we can match your application for ideal homogeneity and melt quality.

Features:

- > Direct drive with multi-speed transmission
- > Constant torque across a wide speed range
- > Minimum wear and minimum maintenance

- > Low noise emission and low vibration
- > Compact design with U arrangement (standard) or Z arrangement (special option)
- > Easy access and assembly
- > Motors can be water-cooled as an option

INDIVIDUAL SCREEN CHANGERS

Hosokawa Alpine offers a variety of screen filtration systems for your specific application;

- > Cylindrical screen changers with large screen area (ASC – Alpine screen changer)
- > Hydraulic screen changers (HSC – hydraulic screen changer)
- > Manual plate style screen changers (MSC – manual screen changer)

Each screen design has certain advantages for specific applications. An ASC changer, for instance, is particularly suitable for processing PE-HD and recycled feedstock while manual and hydraulic screen changers are mainly used for co-extrusion, where short screen changing times are important.

OPTIMUM MATERIAL FEEDING

AMC resin supply system provides resin conveying for precise metering of additives to complex distribution of multiple components for multilayer coextrusion applications. Alpine resin handling systems are designed to accommodate both high volume materials and precise additives with equal precision.

> 2



> 3



> Extruder in U-configuration



> Ideal proportions: Screw length to diameter ratio (L/D) = factor 30.

PRECISE METERING

AMD system is perfect for continuous online resin dosing. Gravimetric measurement and control, along with precise auger style dosing provides high resolution blending capability up to 7 layers. The “loss in weight” system operates independently of the raw material density and provides for quick job changes.

EASY BUT PRECISE

The AMB is batch blending that utilizes “gain in weight” principle. Ease of operation is combined with high output rates and a compact design. This method guarantees precision metering. Independent batches are produced and conveyed to the appropriate extruder(s).



› Our die heads are distinguished by their extremely compact structure.

THE X-DIE

Patented technology, unparalleled performance.

Our patented X-Die technology for multi-layer films is your key to a competitive advantage to produce the highest level of film quality. The X-Die was developed with state-of-the-art computer modeling. The spiral distributors and pre-distribution were designed and optimized to produce thermal homogeneity of the melt with lowest possible residence time. The X-Die

eliminates visual port lines from the film. The result: outstanding optical properties in combination with impressive film thickness tolerances – even for individual layers. These properties are essential for premium-quality films. Your benefit: unrivalled film quality even for high throughput rates and minimum purging times during material changeovers.



› The spiral distributor provides a high melt homogeneity

Other benefits:

- Reduced raw material loss during material changeovers
- High output rates due to low operating pressure in the die head
- Easy access for cleaning
- All wetted surfaces are coated and hand polished
- Self-cleaning design ensures maximum uptime due to reduced die clean intervals
- Full free flow IBC supply and exhaust provides most efficient bubble cooling.

HIGHLY EFFICIENT COOLING SYSTEMS FOR MAXIMUM OUTPUT RATES

Cooling systems for both outer and inner cooling of the bubble. The system is matched to your application and bubble shape. Alpine's ongoing development of highly efficient cooling systems delivers the maximum output production rates.



» For us, standard solutions are not enough. We develop customized line configurations that are tailored to our customers' requirements.

Alexandra Endres, Dipl.-Ing. (FH),
Area Sales Manager

➤ **Mono die heads**

Type	Die Ø in mm
BF 10-25 K2	100 – 250
BF 14-35 K2	140 – 400
BF 40-63 K2	400 – 630

➤ **3-layer die heads**

Type	Die Ø in mm
TBF 16-32 X	160 – 400
TBF 25-50 X	250 – 500
TBF 56-71 X	560 – 710

➤ **5-layer die heads**

Type	Die Ø in mm
FBF 16-40 X	160 – 400
FBF 40-56 X	400 – 560
FBF 50-63 X	500 – 630
FBF 63-80 X	630 – 800

➤ **7-layer die heads**

Type	Die Ø in mm
SBF 16-40 X	160 – 400
SBF 40-56 X	400 – 560
SBF 50-63 X	500 – 630

➤ **9-layer die head**

Type	Die Ø in mm
NBF 40-56 X	400 – 560

➤ **11-layer die head**

Type	Die Ø in mm
EBF 40-56 X	400 – 560

➤ *Alpine's X-Dies are available in diameters from 160 mm and 710 mm for the production of mono-layer through 11-layer co-extrusion blown films.*



➤ **Efficient standard cooling:** CR cooling ring with dual-lip AX insert for low stalk bubbles (l) and dual lip LX insert for high stalk (ml).

➤ **Height-adjustable cooling systems for maximum output rates:** CRV cooling ring with triple lip insert VX (mr) and additional maximizers for better film-handling TMX (r). These systems are able to increase outputs by as much as 40%, depending upon materials, blow up ratios, etc.

HOSOKAWA ALPINE ORIGINAL COMPONENTS

The art of efficient film production.

CRP SEGMENT COOLING RING

Alpine's auto-gauging air ring (CRP) reduces film gauge variation by controlling cooling air temperatures at specific points around the bubble. This technology provides the most advanced film output production and gauge control for both low and high stalk.



➤ Cooling ring CRP for film thickness control.

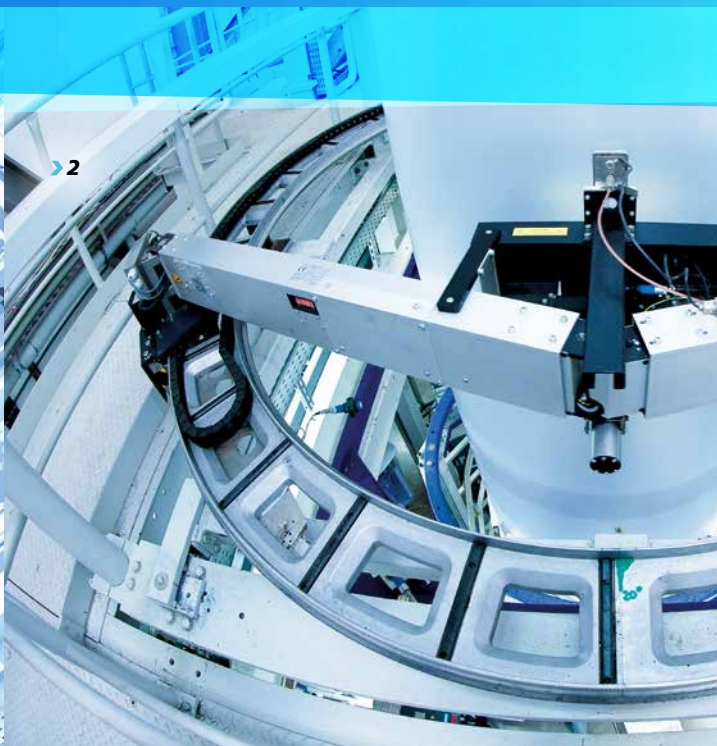
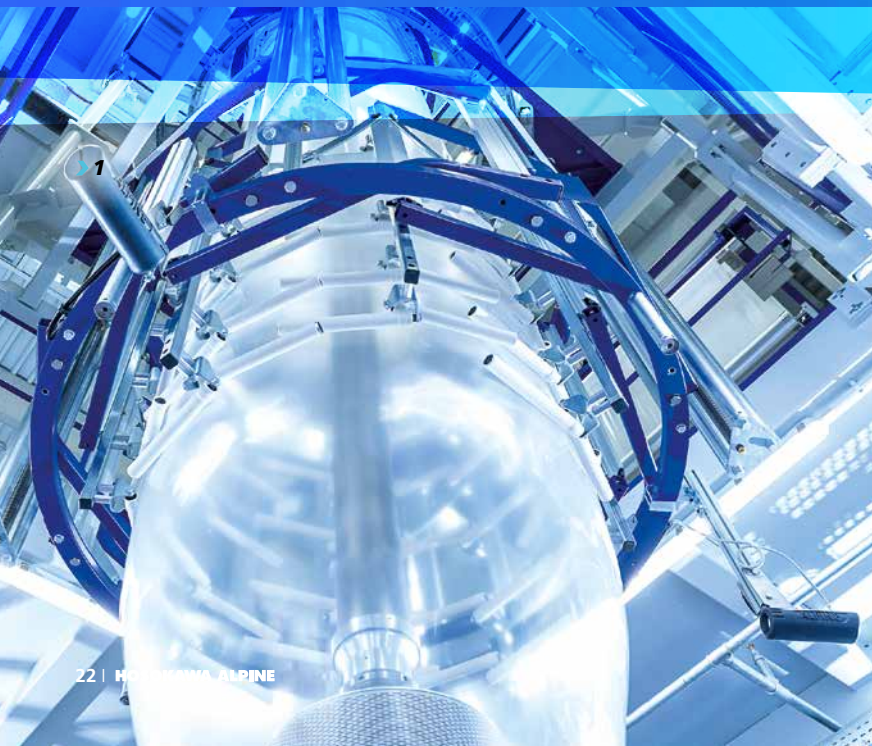
AUTOMATIC BDC BUBBLE DIAMETER CONTROL

Our blown film lines are typically equipped with IBC internal bubble cooling. Combined with the BDC system for automatic bubble control, this system ensures an exacting layflat width.

BUBBLE CALIBRATION

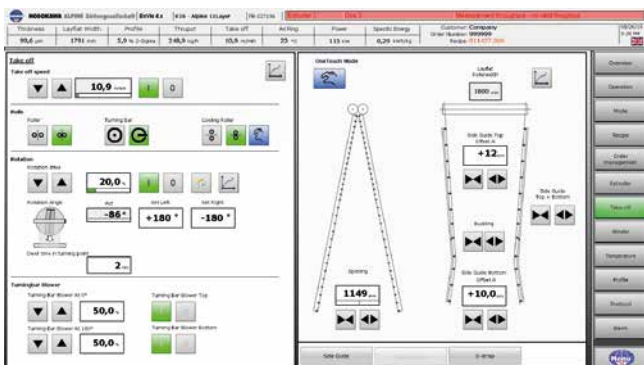
The calibration basket stabilizes the film bubble after the frost line and before entering the collapsing frames. Sonar sensors monitor

and maintain layflat width. Hosokawa Alpine offers a variety of bubble calibration cage sizes of film bubbles up to 3500mm layflat width. We also offer a variety of roller materials.



ExVis PROCESS VISUALIZATION

Operator friendly, organized, dependable.



► Available as an option: the "ONE Touch" software package allows fast changeovers from one film program to the next.

THICKNESS PROFILE MEASURING AND CONTROL

Online and continuous film gauge profile measuring, control and recording on the ProVis profile visualisation system provide the tightest blown film thickness profile. The more reliable and extensive the control and monitoring of your film production process is, the higher the film quality becomes. The ExVis Extrusion visualization system provides complete control, trending, and reporting, on all product, processes and operations.

Operators can change parameters during the production process. Film formulations and the corresponding operating data can be stored in a database and retrieved at any time. All processors are connected to the central PLC via Profibus. The system can also be integrated into the customer's home network.

- 1 The bubble calibration basket is component of the bubble diameter control
- 2 The profile measuring system monitors the film thickness online for instant feedback.
- 3 User-friendly process control is provided by the ExVis visualization system.





FILM TAKE-OFF AND FILM WINDER

Precision web handling.

- **1** Bubble collapsing is available with side guides or gusset boards.
- **2** We offer a various winder options.
- **3** The ATW stacked turret winder has a very small footprint.
- **4** and is available with reverse wind capability.


Film take off systems are designed for your specific application. Oscillating haul off nips improve roll geometry while maintaining wrinkle free film. Oscillating nip systems can be mounted on revolving frames (AON); or suspended in a hanging design (AHN).

Collapsing frames are constructed with either carbon fiber rollers, wood slats, or a combination of both depending on friction/tension requirements. Side guides or gusset boards can also be provided depending on your exact film application.



➤ We offer winders with layflat widths of up to 3,500 mm.




 Our film winders are easy to operate and deliver excellent roll geometry.

Albert Schiffelholz, Project Engineering

HIGH-PRECISION FILM WINDING WITH FLATBED WINDERS

The film winder is the final stage of the blown film production process. Hosokawa Alpine designs and develops this critical component to exacting performance specifications. Several winder models are available, with multiple options to serve your specific application.

Winder series:

- Contact winder
- Contact, central, gap winder
- Contact, central, gap winder with reverse winding option
- Turret winders, stacked or dual station

Winders are available in a single-station configuration; or as dual winders in face-to-face or back-to-back configurations. Auxiliary take-offs are either integrated or can be retrofitted.

Pressure rolls provide precise pressure on sensitive film. They are available as cross grooved rolls as well. Options include driven bowed rolls with adjustable bow, and reverse winding.

Alpine winders are available up to 2.600 mm in width.

MDO FILM ORIENTATION LINES

Film finishing for excellent optical and mechanical properties.

Hosokawa Alpine MDO (Machine Direction Orientation) mono-axial film orientation lines allow enhancement of selected film properties such as stiffness, shrinkage or tear resistance to suit your specific application. Oriented film has superior mechanical and optical properties. Barrier film orientation reduces its gas and vapor permeability.

ORIENTING = FINISHING + SAVING COSTS

Film orientation has an impressive cost saving potential. For example, you can produce packaging film with a lower thickness, i.e. less

required material, but achieve properties similar to non-oriented film. The Hosokawa Alpine OrVis software (orientation-visualization-program) reliably monitors the quality and properties of oriented film.

Other benefits of the orientation process:

- Optical properties, haze and clarity
- Stiffness
- Machinability
- Improved barrier properties
- Improved shrink properties

The MDO film orientation process in detail:

➤ **Heating phase**

The film is conveyed along on heated rolls until it has the ideal temperature.

➤ **Stretching phase**

The heated film is stretched between two rolls until it has reached the required stretching ratio.

➤ **Annealing phase**

Annealing rolls reduce any tension built up during the orientation process.

➤ **Cooling phase**

Film cooling and shrinking compensation.

THE PATENTED TRIO SYSTEM

Less trim waste and improved film flatness for the MDO inline stretching process. During the inline orientation process of blown film, the film is stretched or oriented in the machine direction, this process results in thick edges that must be trimmed.

The patented TRIO system optimizes the film thickness profile in-line, while compensating for haul off nip oscillation. The result: minimum thickness variation across the entire layflat width. Compared to systems without TRIO, edge trim is reduced by up to 50%, while the film flatness is greatly improved for converting.



➤ We are your specialist for film orientation lines – since 2000.



HOSOKAWA ALPINE MDO

› The OrVis software package allows the easy and intuitive operation of film orientation lines.



SERVICE MADE IN GERMANY

Hosokawa Alpine offers a comprehensive service package.

- > 1 Construction with CAD 3D.
- > 2 Extruder assembly.

Comprehensive support from the very beginning is our trademark. We provide you a customized service package for your production lines. The benefit is continued service and profitability from your Hosokawa Alpine blown film line.

TEN POINTS OF FOCUS: OUR SERVICE COMMITMENT TO YOUR BLOWN FILM LINE

1 SALES

Our sales department is trained and qualified to assist you throughout the entire process of your equipment purchase.

2 PLANNING

We engineer your blown film line to exacting detail and ensure that it is designed to your specific application requirements.

3 CUSTOMIZATION

Alpine welcomes customer requests of all types. Whether you require custom line specifications or advanced training packages, we can help – contact us!

4 PRODUCTION & LINE AUTOMATION

Our mechanical production department in Augsburg/Germany operates a wide range of state-of-the-art production lines. Our line automation department applies processing expertise to software and hardware development.

5 DELIVERY

All delivery options are available; Transport by ship, truck or aircraft: our shipping department will organize a safe and reliable delivery of your line.

6 ON-SITE ASSEMBLY

Installation and assembly is provided by experienced Hosokawa Alpine technicians. Depending on the agreement, you may receive turnkey assembly or installation supervision for your technicians.



7 START-UP

Line start-up is achieved as outlined in our contract. We assist you during the production of the first formulation and help you with a successful transition from line approval to real production conditions.

8 SERVICE

Our technical after-sales service is a crucial part of our care and quality commitment for your Hosokawa Alpine blown film line. Maximum uptime is ensured by our highly skilled, trained and experienced support team.

Our service commitment includes:

- > Supply of spare parts including long-term availability via express delivery
- > Support hotline & remote diagnostics via modem or DSL (via the internet)
- > Full Service & maintenance contracts
- > On-site service team if required
- > Pre-emptive maintenance and inspection
- > Die head service & die head cleaning

- > In-house repair service or on-site assistance
- > Extensive consultancy services
- > Line update and process optimization
- > On-site training directly on the line

9 UPDATES- RETROFITS

We make every effort to ensure that our technological advancements are retrofittable. Contact us for potential updates and retrofitting options for all process areas, from more efficient cooling systems to state-of-the-art profile optimization – we will increase your output rates to expand your production options.



10 FLEXIBILITY RESULTS IN INNOVATION

Hosokawa Alpine's engineering group is open to all new and developing ideas. Our flexibility to industry needs fosters innovation. Innovation insures your profitability.

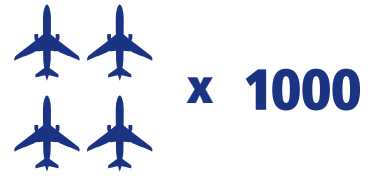
» *Contact us, we provide a detailed proposal for your specific application.*

» *We will organize the complete project to ensure that you can start your production right on schedule.*

Uwe Seidel, After-Sales-Service Technician

1956

FIRST ALPINE
EXTRUDER FOR PROFILE
EXTRUSION.



1,86 MIO. TONS

The global demand for high barrier film reached 1,86 Mio. tons in 2016 – which is equivalent to a weight of four times thousand Airbus A380 airplanes – and shall continuously grow by almost 5 percent per year (Smithers Pira, 2016).

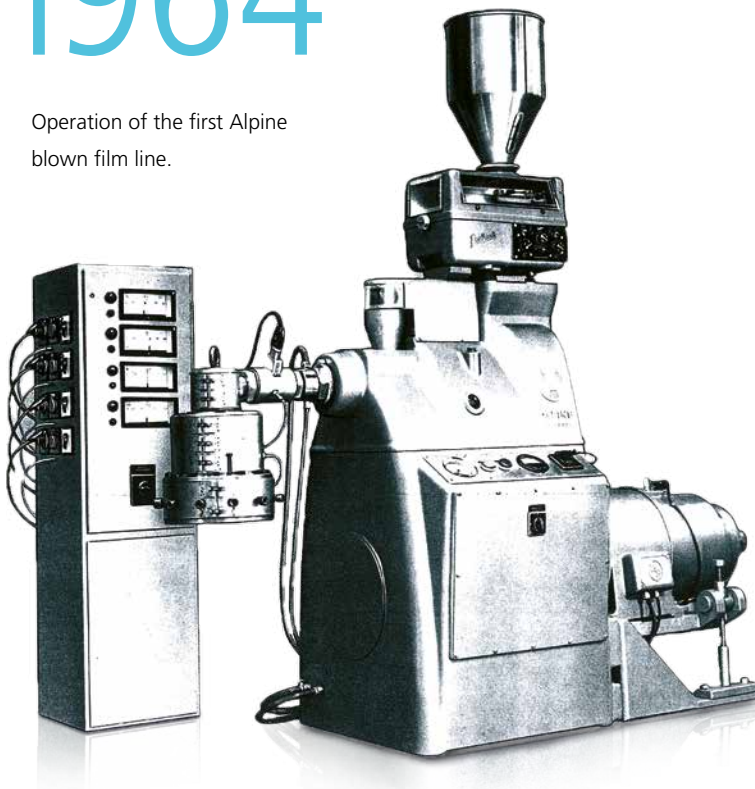


ONLY **30 MINUTES**
FOR A COMPLETE
PRODUCTION CHANGE-
OVER ON A 9-LAYER LINE.

Our die heads have the shortest purging times in the market. Shorter purging times, means quicker job changes, this can result in savings of hundreds of thousands of Euros.

1964

Operation of the first Alpine
blown film line.



50%

LESS TRIM-WASTE

thanks to our MDO + TRIO in-line technology.



5 µm is the thickness measurement of the thinnest film (PEHD) produced on Alpine blown film lines. For comparison: thickness of a human hair is **60–100 µm**.

HIGH-BARRIER FILM

In Germany alone an estimated amount of **20 mio. tons** of food are lost to spoilage every year. The positive properties of **high-barrier film** prolong the storage time of food and help to reduce this waste.



250,000 / h

MAXIMUM OUTPUT RATES AMOUNTED TO MORE THAN 1000 kg/h. THAT IS THE EQUIVALENT OF **250,000** STANDARD 20-LITER-DISPOSAL BAGS PER HOUR.

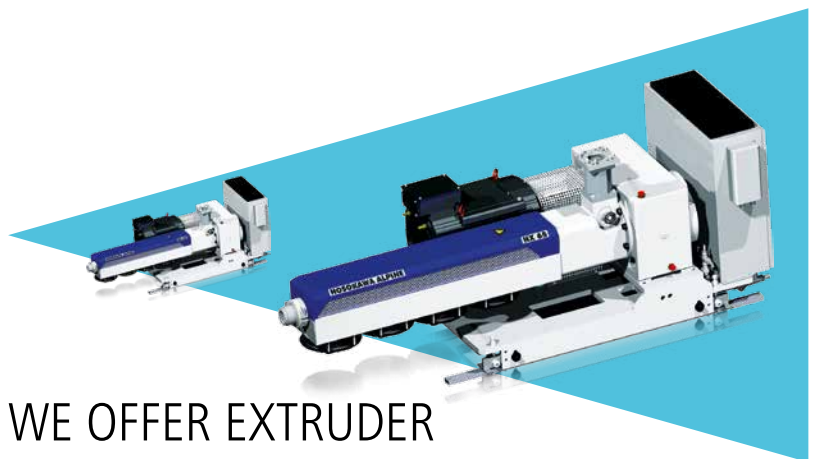


15-20 METERS

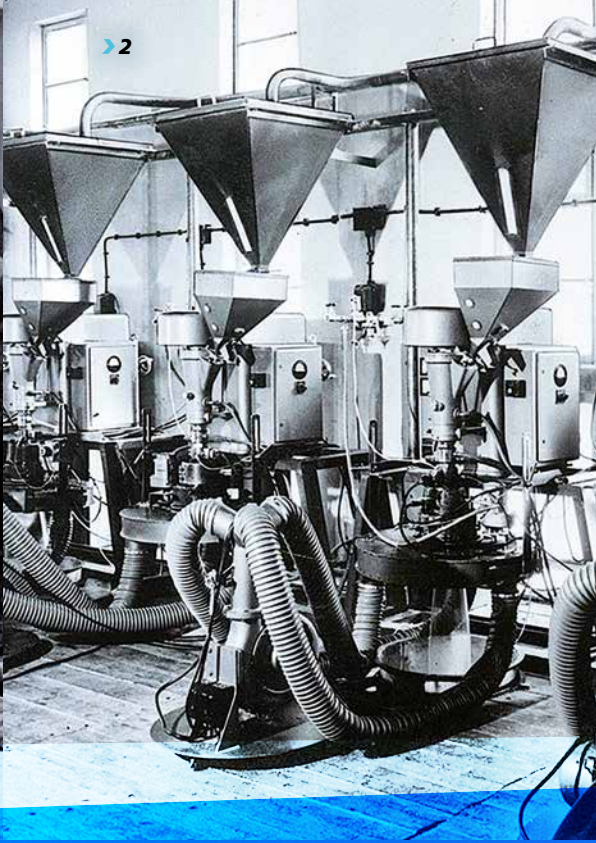
Larger blown film lines produce higher output rates: blown film lines with overall heights from **15 to 20 meters** are standard.



HOSOKAWA ALPINE DIE HEADS WEIGH BETWEEN **160 kg** AND **9 t**.



WE OFFER EXTRUDER SIZES FROM **50 mm** TO **135 mm** IN DIAMETER.



PROCESS TECHNOLOGIES FOR TOMORROW

The success story of the Hosokawa Alpine Group.

▶ **In 1898**, Otto Holzhäuer founded his machine shop in Augsburg, Germany: this is the beginning of "Alpine". Powder and particle processing became a focus in the early years, Alpine received its first patent for its "Triumph" general-purpose shredder in 1903.

▶ **Since the beginning of the 1960s**, Alpine has been developing blown film lines for premium-quality films.

▶ **In 1987**, the company became a member of Hosokawa Micron Group with headquarters in Osaka, Japan, and has been operating

under the name of Hosokawa Alpine AG ever since.

▶ **Today** the Group is leading global markets in powder and particle processing and is one of the leading supplier of blown film plastics processing machinery.



▶ 1898

ALPINE



▶ 1950

Alpine



▶ 1970



HOSOKAWA ALPINE

▶ 1987



- **1** Company founder and staff in 1900.
- **2** Alpine screw press HS 25 with film die head from 1954.
- **3** Test center in Augsburg, Germany.

FIT FOR THE FUTURE

Cost-efficient and environmentally-friendly production.

A sustained vision of excellence has produced a continuous stream of incremental improvements in the blown film process; the result is superior blown film quality at the highest rates:

➤ **MORE LAYERS** = **INTELLIGENT PRODUCTION**

Our multi-layer film lines with up to eleven layers allow you to save costs through strategic film structures, improving film performance and reducing material costs.

➤ **IN-HOUSE RESEARCH** = **PROFITABLE SOLUTIONS**

Alpine's lab facilities are your source for innovative and profitable solutions for your customers.

➤ **PRECISE METERING** = **LESS CONSUMPTION**

Intelligent control of raw material supply to monitor every pellet.

➤ **FILM ORIENTATION** = **LESS MATERIAL**

Material savings and enhance physical properties.

➤ **TRIO** = **50% LESS TRIM WASTE**

TRIO reduces trim scrap in the MDO by more than 50%.



HOSOKAWA ALPINE INTERNATIONAL

Your Global Partner.

› **HOSOKAWA ALPINE GROUP**

1 **GERMANY**

HOSOKAWA ALPINE Aktiengesellschaft
Peter-Doerfler-Str. 13–25
86199 Augsburg

Phone: + 49 821 5906-0

Fax: + 49 821 5906-129

E-Mail: plastics@alpine.hosokawa.com



HOSOKAWA ALPINE

Process technologies for tomorrow.

2 GERMANY

HOSOKAWA KOLB GMBH
Spicher Str. 40–42
53859 Niederkassel

Phone: + 49 22 08 9 44 70
Fax: + 49 22 08 9 44 79
E-Mail: info@hosokawa-kolb.de

3 USA

HOSOKAWA ALPINE AMERICAN INC.
455 Whitney Street
Northborough, MA
01532 USA

Phone: + 1 508 655 1123
Fax: + 1 508 655 9337
E-Mail: daven@hosokawaalpine.com

4 MALAYSIA

HOSOKAWA MICRON (Malaysia) SDN BHD
No. 109C, Jalan SS 21/1A
Damansara Utama
47400 Petaling Jaya Selangor

Phone: + 603-7725 7433
Fax: + 603-7725 6433
E-Mail: alpine.filmdivision@hmm-hosokawa.com.my



HOSOKAWA ALPINE

Process technologies for tomorrow.

HOSOKAWA ALPINE AKTIENGESELLSCHAFT

Peter-Doerfler-Strasse 13 – 25
86199 Augsburg
Germany

Phone: + 49 821 5906-0
Fax: + 49 821 5906-129
E-mail: plastics@alpine.hosokawa.com

www.hosokawa-alpine.com

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