



Finishing and Lapping Films with diamond
and aluminum oxide on polyester foil

1A - For your final finish!





We satisfy!

Superfinishing with polyester films

As one of the leading suppliers in the sector of flexible abrasives on polyester film, the company 1A-Abrasives GmbH is differentiated with a wide product range of Finishing and Lapping Films. Knowledge of abrasives technology for individual customer solutions as well as very fast and reliable delivery times are the basis for our success.

Superfinishing with films has become increasingly important within many industrial sectors. This finishing capability makes it possible to use an absolutely reproduceable process and achieve precise surface finish on peripheral- and plane surfaces in micrometer range. Reduced processing times allow an enormous saving of costs while achieving absolutely reliable results.

The product range of the 1A-Abrasives GmbH includes Lapping Film (slurry coated) and Finishing Film (electrostatic concentrated) which are made of polyester foil coated with diamond- and aluminum oxide grit. As additionally, silicon carbide can be provided on rolls with cores or as pre-cut sheets.

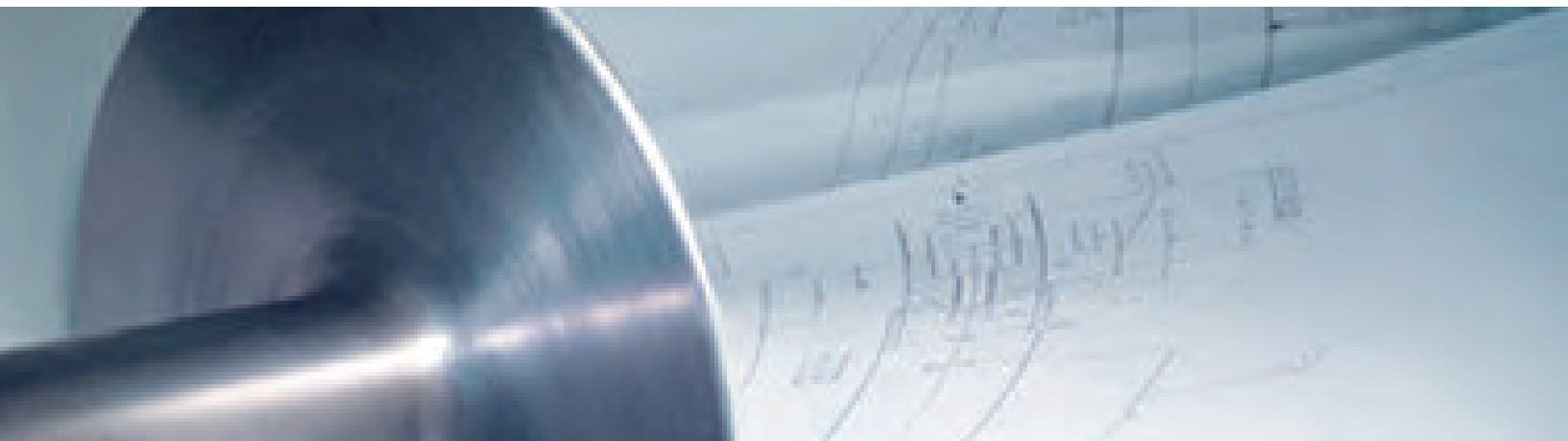
Finishing – the term for quality

for an efficient process, to achieve repeatable, appropriate surfaces on first go.

Finishing has become increasingly important, as the requirements on defined surface qualities are continuously increasing and the required results have to be achieved in a stable and time efficient manner. Despite clever tool techniques while grinding and complex production methods during turning, this is for more and more products inadequate. That is why finishing is rapidly evolving as the innovative alternative of the traditional process of grinding and polishing.

Finishing with films

Continuous feed of virgin (new) abrasive is the basis for constant finishing results and repeatable qualities. Through an additional work piece rotation and tool oscillation the abrasive particles design a sine wave which is characteristic for this process. Compared to dedicated machines for finishing, superfinishing attachments are price competitive and make the use of finishing technology possible with ordinary turning machines. If necessary, the needed surface roughness values can be achieved by multi-level processes. Generally it is possible to reduce the R_a -values by 50% with each machining step.



The advantages

- reducing the R_a -value by 50% with each machine step (empirical formula)
- absolute repeatable surfaces and defined surface structures
- lower wear of the work piece surfaces
- short processing times of the work pieces
- low friction coefficient are reducing the noise level of the parts in later use
- environmentally sound, as ordinary lubricants and even water can be used
- no grit attack (no scratches or commas)
- thermally neutral working process
- improvement of the working behavior (surface stressed parts)
- avoidance of softening, free of surface tensions and micro cracking



Process assurance in production

The process

Finishing – How to use: Compared to stone finishing, finishing with films enables a consistent and constant surface right from the start. Through a controlled, continuous feed of the film, new abrasive grit is always being used. In connection with the correct feed rate, rotational speed of the work piece and the correct contact pressure an absolute precise and repeatable surface result will be achieved. The grain protrusion and therefore the stock removal rate will be defined by the grit size, the grit type and the layer thickness of the bonding.

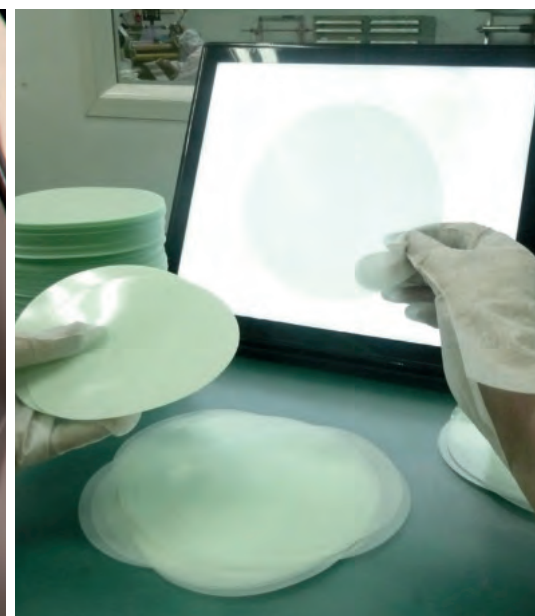
Furthermore variations in hardness of the pressure rolls from soft to hard makes it possible to optimize the size of the contact area between film and work piece according to the material consistency. The requirements for waste removal and processing treatment of the cooling lubricants is much lower in cost, cleaner and more environmental friendly by finishing with films (compared to stone finishing), as ordinary lubricants can be used.



1A – the convincing quality

... of the 1A-Finishing Films is a result of steady control of the used crystals: diamond, aluminum oxide or silicon carbide.

- constant grit sizes and grit shapes
- close grit distribution
- strong bonding of the resin bond layer on the base foil
- very good bonding of the grit through a resin bond adhesive agent
- uniform grit distribution
- avoiding of agglomeration – no clumping of several grains
- sufficient strength of the polyester base material (PET base foil)

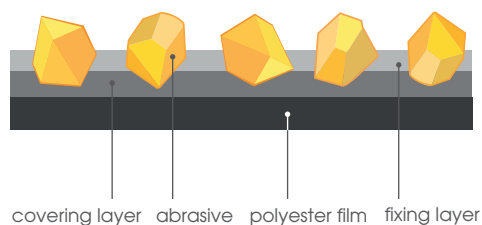


Superfinishing Film - production

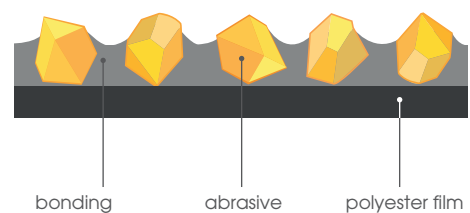
Our films typically consist of the **backing material**, the **abrasives particles** and the **bonding agent**.

- Backing material: a tear and stretch resistant base film, usually polyester foil
(3Mil = 75µm | 4Mil = 100µm | 5Mil = 125µm)
- Abrasives: The particles are selected according to their dimension and slurry coated (LF) or electrostatically spread (FF) on the base film
- Bonding agent: A bonding agent based on synthetic resin secures the abrasive particles to the backing material
- fixing layer: to stabilize the composition, an additional adhesives agent will be sprayed on after electrostatical deposition of the grit

electrostatic concentrated type FF



slurry coated type LF





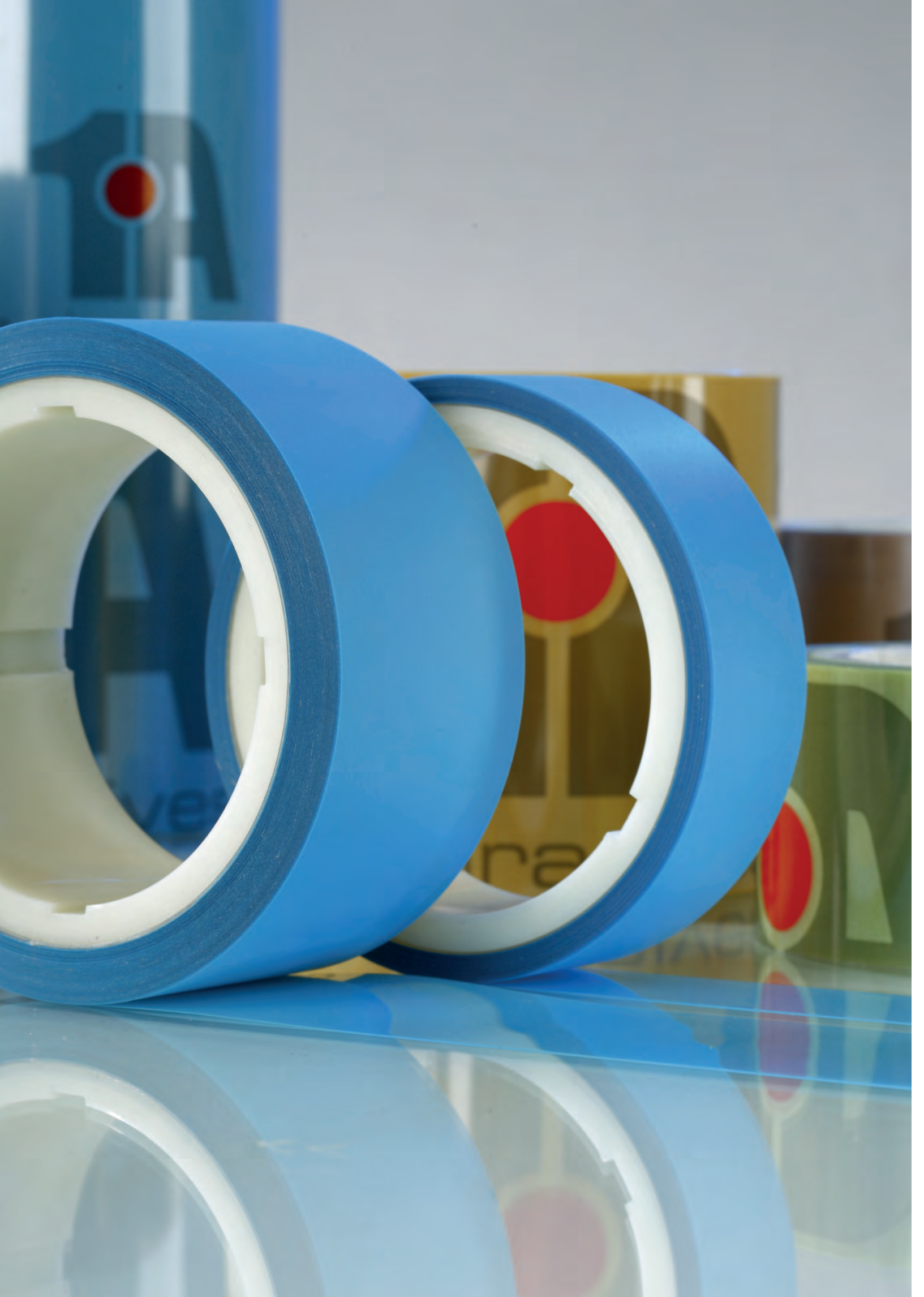
Diamond – the premium quality

Superfinishing Films - types

To achieve a well-defined and constant, repeatable surface, stable working parameters are necessary. Contact pressure and therefore the stress of individual grit will be achieved through the use of polyester foil as base material. This foil will be coated with abrasive, which will be selected according to CIS-norm (Calibration for industrial standards) and then fixed with a special bonding.

Control values in use

- contact pressure
- hardness of the draw roll
- feed of the superfinish attachment
- speed of film feed
- grit size of the film
- oscillation rate
- rotational speed of the work piece



1A-DLF Diamond Lapping Film

(Diamond)

... offers a reliable finish on hard surfaces. The backing material is a water resistant, tough and consistent polyester foil. The resin bond between the particles and the film ensures utmost repeatability and permanent and consistent surface processing. The integrated diamond micron powder bonds firmly on the polyester film substrate. 1A-Diamond Lapping Film is ideal for fine lapping and polishing of the hardest metallic or ceramic surfaces. It offers a repeatable and precise surface finish on extremely hard and hardened materials.

Application

Materials:	carbides, metals, ceramics, glass, rocks and minerals, titanium, gem stones
Work pieces:	rollers, fiber optic connectors, magnetic heads, metallurgical devices, engine and machine parts, computer hard discs, chrome-plated work pieces, high alloy surfaces
Industries:	roller manufacturer and roller coating services, automotive, ophthalmic, fiber optic, ceramic and computer peripherals

Spezification

Grit sizes (µm)	0,5	1	3	6	9	12	15	30	40	45	60	80	100
Abrasives	Diamond - slurry coated												
Backing material	Polyester film (3Mil = 75µm)												
Abrasive side/rolls	outside (ASO; standard)												
Dimensions	standard rolls 100mm x 16m other sizes according to customers specification												
Backing	discs and sheets also with self adhesive tape available (PSA)												
Core	3 inch with notches and 1 inch												

1A-FF Finishing Film

(Aluminum Oxide)

... is a concentrated aluminum oxide abrasive, precision coated on a water resistant and tough polyester foil. The bonding of the abrasive particles provides flexibility and a steady hold on the film substrate. It provides a reliable finish on hard surfaces. The resin bond between the particles and the film ensures an absolute permanent and consistent processing of the surface. The integrated aluminum oxide bonds with accuracy onto the polyester backing material. 1A-Finishing Film offers a repeatable precision finish on extremely hard and hardened materials.

Application

Materials:	metals, plastic, rubber, wood, composite material, fiber-glass
Work pieces:	cam shafts, crank shafts, paint spot repair, rolls for superfinishing, glasses, chrome rolls, hardened rolls, rubber rolls, ball bearings, hydraulic components, copper rolls, steering rod, lenses, oxide panes, plasma coated rolls, pneumatic components, shock absorber, watch components, valves, racks, ceramic and chrome-plated work pieces
Industries:	automotive industry, roller manufacturer, roller coating services, ophthalmic industry, watch manufacturer, wood industry, etc.

Specification

Grit sizes (µm)	9	12	15	20	30	40	50	60	80	100
Abrasives	Aluminum oxide - electrostatically spread									
Backing material	Polyester film (5Mil = 125µm and 3Mil = 75µm)									
Abrasive side/rolls	outside (ASO; standard)									
Dimensions	standard rolls 100mm x 50m other sizes according to customers specification									
Backing	with/without anti-slipping-backing (ARB) discs and sheets also with self adhesive tape available (PSA)									
Core	3 inch with notches and 1 inch									





1A-LF Lapping Film

(Aluminum Oxide)

...is suitable for industrial processing of metal and non-metal surfaces. The water resistant and tough polyester film is combined with a flexible abrasive slurry coating of aluminum oxide grit for nano-fine, constant polishing. Our bonding system and the consistent grit size ensures the processing of reliable and uniform surfaces. The use of 1A-Lapping Film – from coarse to fine, eliminates the need to contain and remove polishing slurries and polishes to a finer and defined surface finish on hard materials.

Application

Materials:	plastic, hardwood, metals, non-ferrous metals, glass, rubber, gem stones
Work pieces:	fiber optic connectors, magnetic heads, windshields, CDs, thin film discs, oxide discs, floppy discs, gear and train components, optic connectors, metallographic preparations, engine and machine parts, chrome rollers, hardened rollers, hydraulic components, pneumatic components, ball bearings, watch components, ceramic and chrome plated work pieces
Industries:	ophthalmic and fiber optic industry, automotive industry, roller manufacturer and roller coating services, rolls in the printing and paper industries, watch industry

Specification

Grit sizes (µm)	0,3	0,5	1	2	3	5	9	12	15	20	30	40
Abrasives	Aluminum oxide – slurry coated											
Backing material	Polyester film (3Mil = 75µm)											
Abrasive side/rolls	outside (ASO; standard)											
Dimensions	standard rolls 100mm x 50m other sizes according to customers specification											
Backing	discs and sheets also with self adhesive tape available (PSA)											
Core	3 inch with notches or 1 inch											

1A-FF Finishing Film

(Silicon Carbide)

... is a with concentrated silicon carbide abrasives, precision coated, water resistant and tough polyester film. The bonding of the abrasive particles provides flexibility and a steady hold on the film substrate. The resin bond between the particles and the film ensures an absolute permanent and consistent processing of the surface. Our 1A-Finishing Film (SiC) offers a repeatable and precise finish on hard and soft surfaces and provides an aggressive grinding pattern.

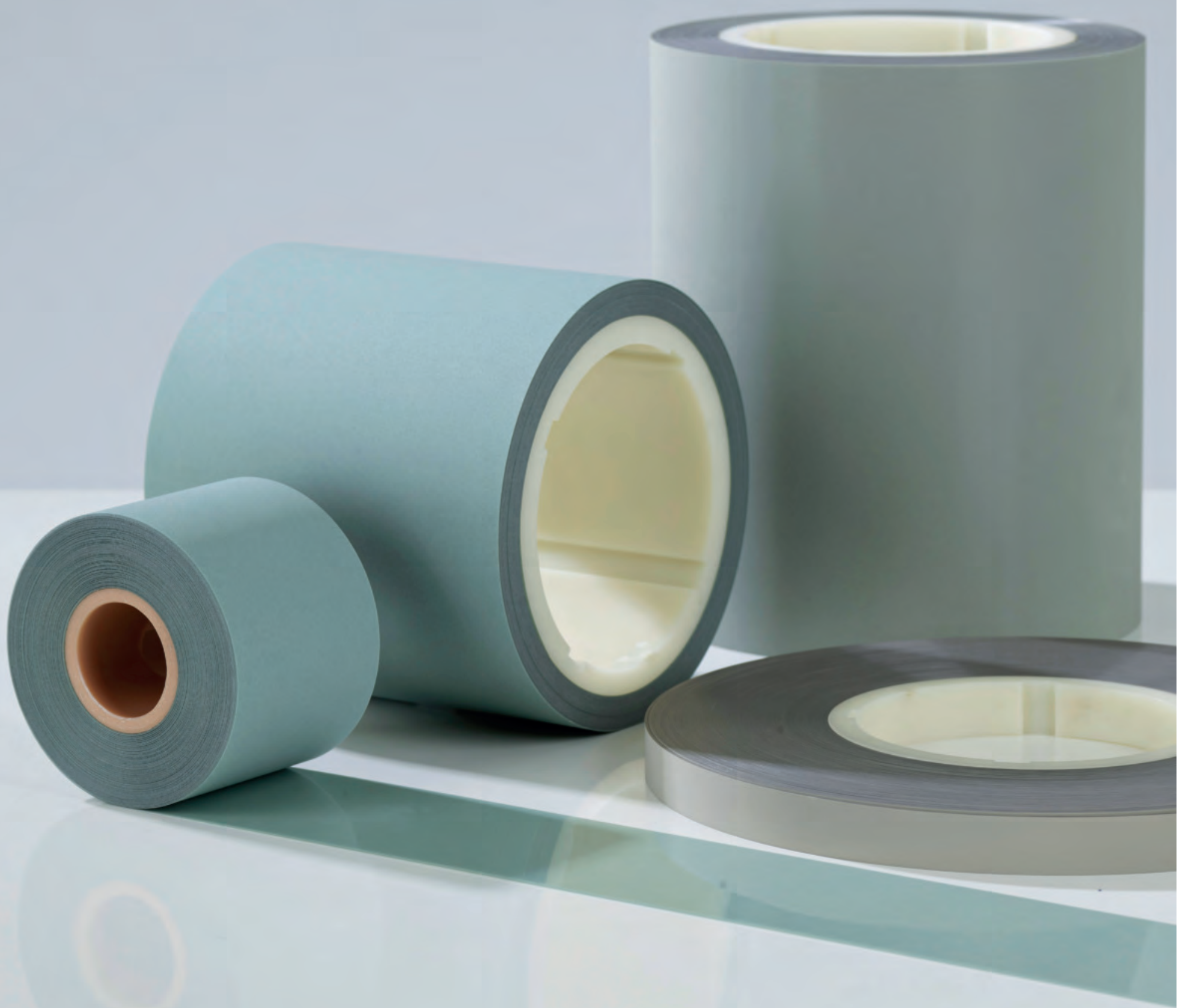
Application

Materials: rubber, plastic, glass, stone, wood, metal, non-ferrous metal, composite, plexiglass
 Work pieces: rubber rollers, plastic rollers, teflon rollers, lacquer parts, wooden parts
 Industries: roller manufacturer, roller coating services, automobile industry, print- and paper industry, instrument manufacturer, furniture industry, stone industry

Spezification

Grit sizes (µm)	9	15	20	30	40	60	80
Abrasives	Silicon carbide - electrostatically spread						
Backing material	Polyester film (4Mil = 100µm)						
Abrasive side/rolls	outside (ASO; standard)						
Dimensions	standard rolls 100mm x 50m other sizes according to customers specification						
Backing	with anti-slipping-backing (ARB) discs and sheets also with self adhesive tape available (PSA)						
Core	3 inch with notches or 1 inch						





1A-LF Lapping Film

(Silicon Carbide)

... offers a repeatable and precise finish on mild and hardened surfaces. The slurry coated grits are equably fixed on a polyester foil by a resin bond. Silicon carbide Lapping Films are suitable for polishing and fine lapping processes. The difference compared to the aluminum oxide is the more aggressive and very effective cutting grit shape.

Application

Materials: rubber, brass, copper, stainless steel, titanium, mild steel, plexiglass
 Work pieces: rubber rollers, plastic rollers, shafts, lacquer parts, fiber optic connectors
 Industries: roller manufacturer, roller coating service, metallurgy, automotive industry, furniture industry, fiber optics

Spezification

Grit sizes (µm)	1	3	5	9	15	30
Abrasives	Silicon carbide - slurry coated					
Backing material	Polyester film (3Mil = 75µm)					
Abrasive side/rolls	outside (ASO; standard)					
Dimensions	standard rolls 100mm x 50m other sizes according to customers specification					
Backing	discs and sheets also with self adhesive tape available (PSA)					
Core	3 inch with notches and 1 inch					

Our extensive
1A-product range



Diamond slurry coated

1A-Diamond Lapping Film I 1A-DLF

Color	µm	FEPA P	base foil
beige	100	150	75µm
beige	80	180	
beige	60	240	
orange	45	320	
dark green	40	360	
green	30	500	
sandy	15	1200	
old rosa	12	1500	
blue	9	2000	
yellow	6	3000	
salmon	3	8000	
grey	1	-	
light brown	0,5	-	

Aluminum Oxide

electrostatic concentrated, with/without anti-slipping-backing (ARB)

1A-Finishing Film (Alox) I 1A-FF (Alox)

Color	µm	FEPA P	base foil
magenta	100	150	125µm and 75µm
blue	80	180	
beige	60	240	
purple	50	280	
yellow	40	360	
blue	30	500	
green	20	1000	
apricot	15	1200	
light rosa	12	1500	
beige	9	2000	

Aluminum Oxide slurry coated

1A-Lapping Film (Alox) I 1A-LF (Alox)

Color	µm	FEPA P	base foil
white	40	360	75µm
green	30	500	
white	20	1000	
brown	15	1200	
yellow	12	1500	
light blue	9	2000	
white	5	3500	
pink	3	8000	
light green	2	-	
blue	1	-	
white	0,5	-	
white	0,3	-	

Silicon Carbide

electrostatic concentrated, with anti-slipping backing (ARB)

1A-Finishing Film (SiC) I 1A-FF (SiC)

Color	µm	FEPA P	base foil
black	80	180	100µm
black	60	240	
black	40	360	
black	30	500	
black	20	1000	
black	15	1200	
black	9	2000	

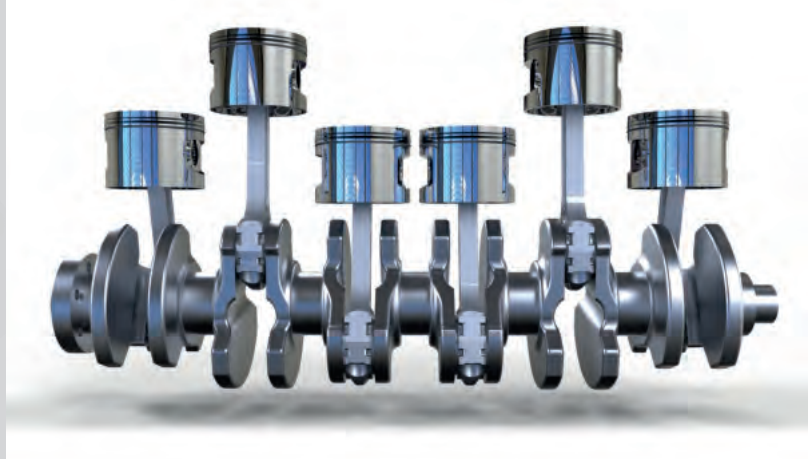
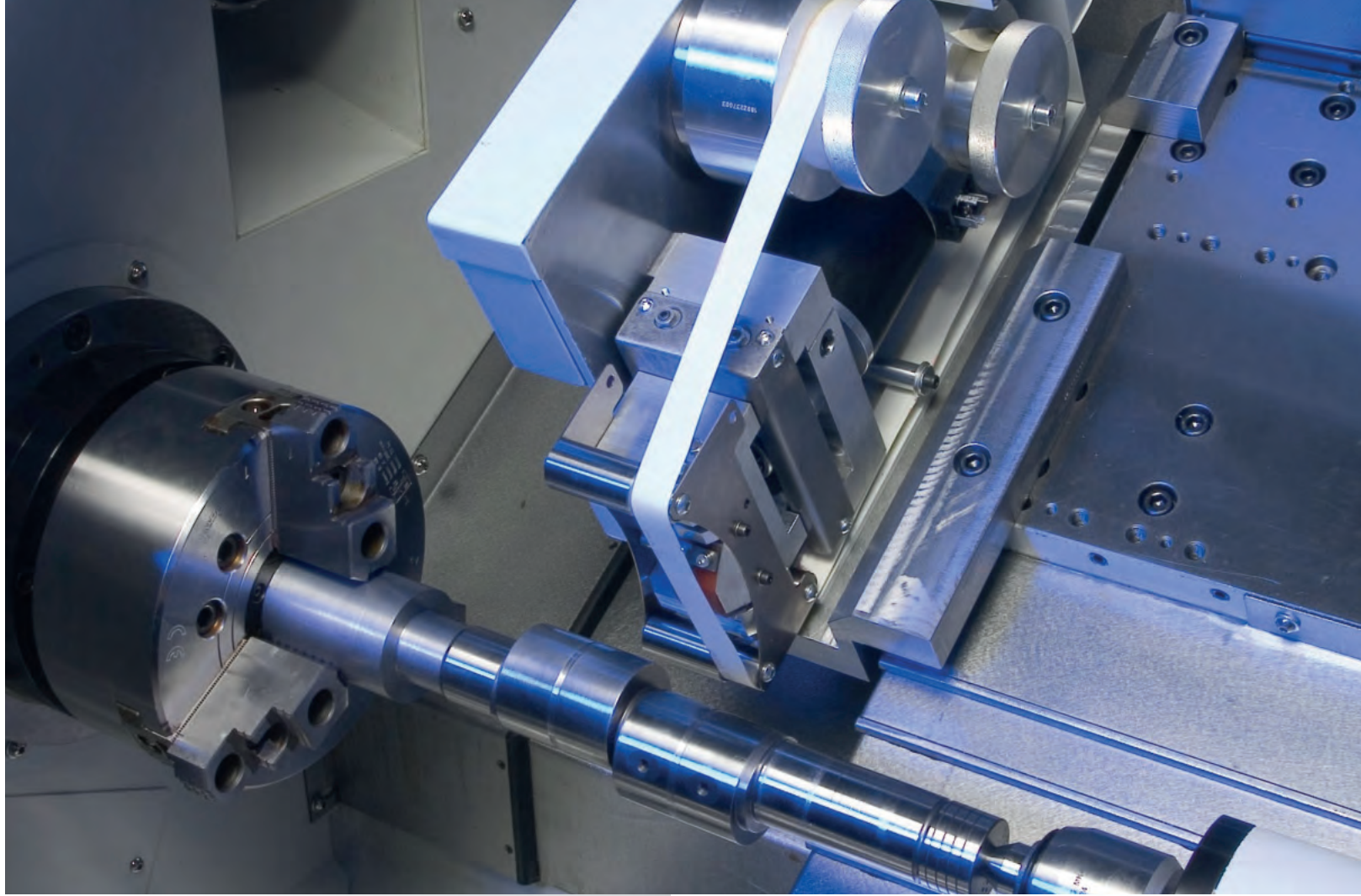
Silicon Carbide slurry coated

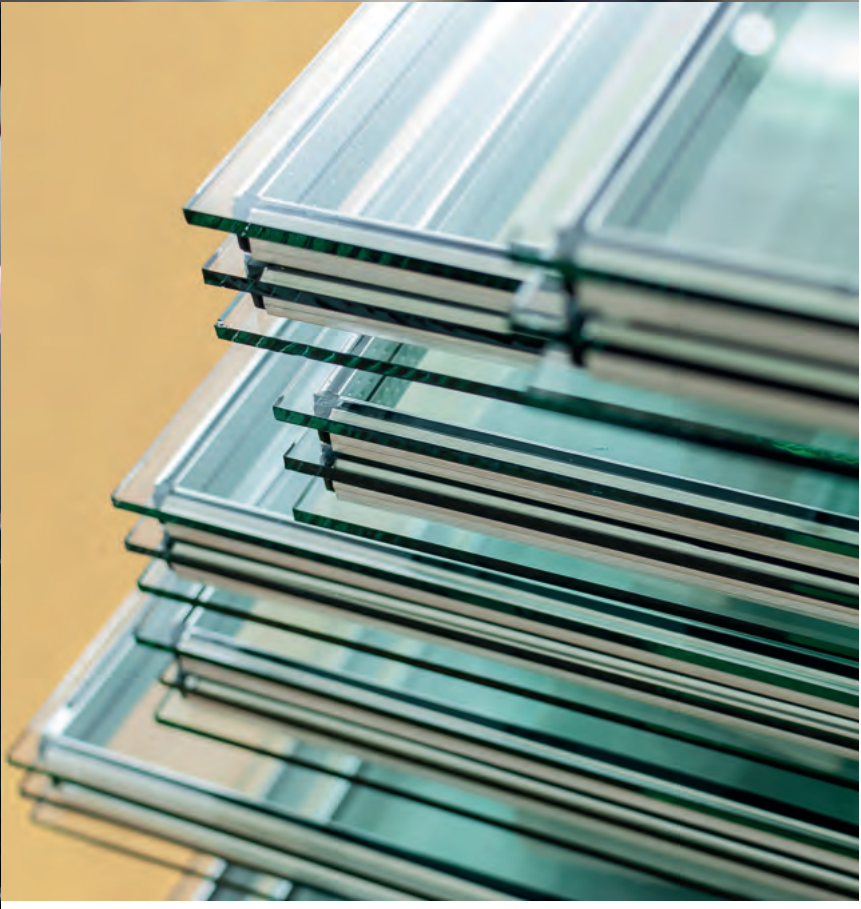
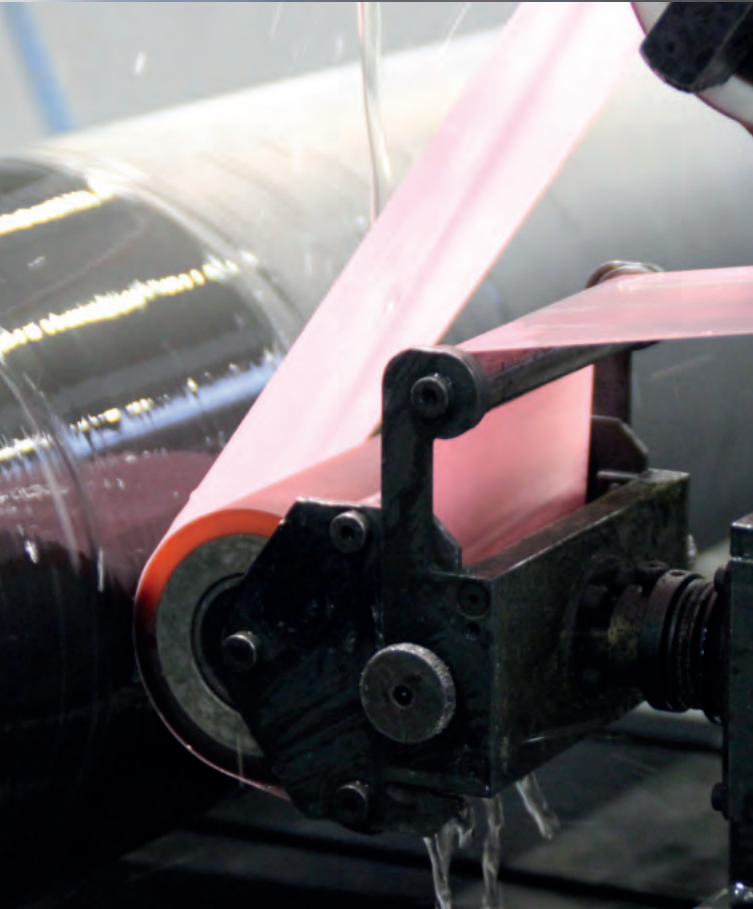
1A-Lapping Film (SiC) I 1A-LF (SiC)

Color	µm	FEPA P	base foil
grey	30	500	75µm
grey	15	1200	
grey	9	2000	
grey	5	3500	
grey	3	8000	
grey	1	-	

Application areas

Film types	1A-DLF	1A-FF (Alox)	1A-LF (Alox)	1A-FF (SiC)	1A-LF (SiC)
Roller manufacturer					
hardened rolls (ceramic, tungsten, carbide...)	•				
chrome rolls/hard chrome rolls	•	•	•		
zinc rolls			•	•	•
hardened steel rolls	•	•	•		
copper rolls		•	•	•	•
rubber and plastic rolls		•		•	•
teflon rolls		•			
composite materials	•		•	•	
Automotive industry and machines					
cam shaft		•	•		
crank shaft		•	•		
steering rod		•	•	•	•
shock absorber		•	•	•	•
valves	•	•	•		
hydraulic components	•	•	•	•	•
pneumatic components		•	•	•	•
gear train components		•	•		
ball bearing	•	•	•		
magnetic head	•		•	•	•
Computer industry					
data medium	•				
Optics					
glasses	•		•	•	•
lenses	•		•	•	•
fiber optic industry	•		•		
glass fiber connections	•		•		
optical connectors	•		•	•	•
Watches					
watch cases, watch strap	•	•	•		









Material

Film types	1A-DLF	1A-FF (Alox)	1A-LF (Alox)	1A-FF (SiC)	1A-LF (SiC)
ceramic	•				
metals and alloys	•	•	•	•	•
composite material	•	•	•	•	•
glass	•		•	•	•
fiber optic	•		•		
rubber		•		•	•
carbide	•			•	•
aluminum	•		•	•	•
gem stones	•		•		
minerals	•				
nonferrous metals	•		•	•	•
plastic		•	•	•	•
titanium	•				•
stone	•		•		

Available forms and dimensions

Forms	Dimensions
 rolls	8-205mm x 16-50m
 sheets	230mm x 280mm
 discs	25-420mm
 endless belts	on request

Further dimensions on request.



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