



**Liveo Research S.r.l.**  
Via XXIV Maggio, 1  
21043 Castiglione Olona  
(VA) - Italy

Tel +39 0331 853 111

[cs.eu@liveoresearch.com](mailto:cs.eu@liveoresearch.com)  
[liveoresearch.com](http://liveoresearch.com)



## CARDS SOLUTIONS

think globally  
act locally



The history of Liveo Research begins in 1953. During the years the company has advanced its technical expertise, expanded its global reach through acquisition and natural growth and continued to develop, refine and launch new value added products into the marketplace.

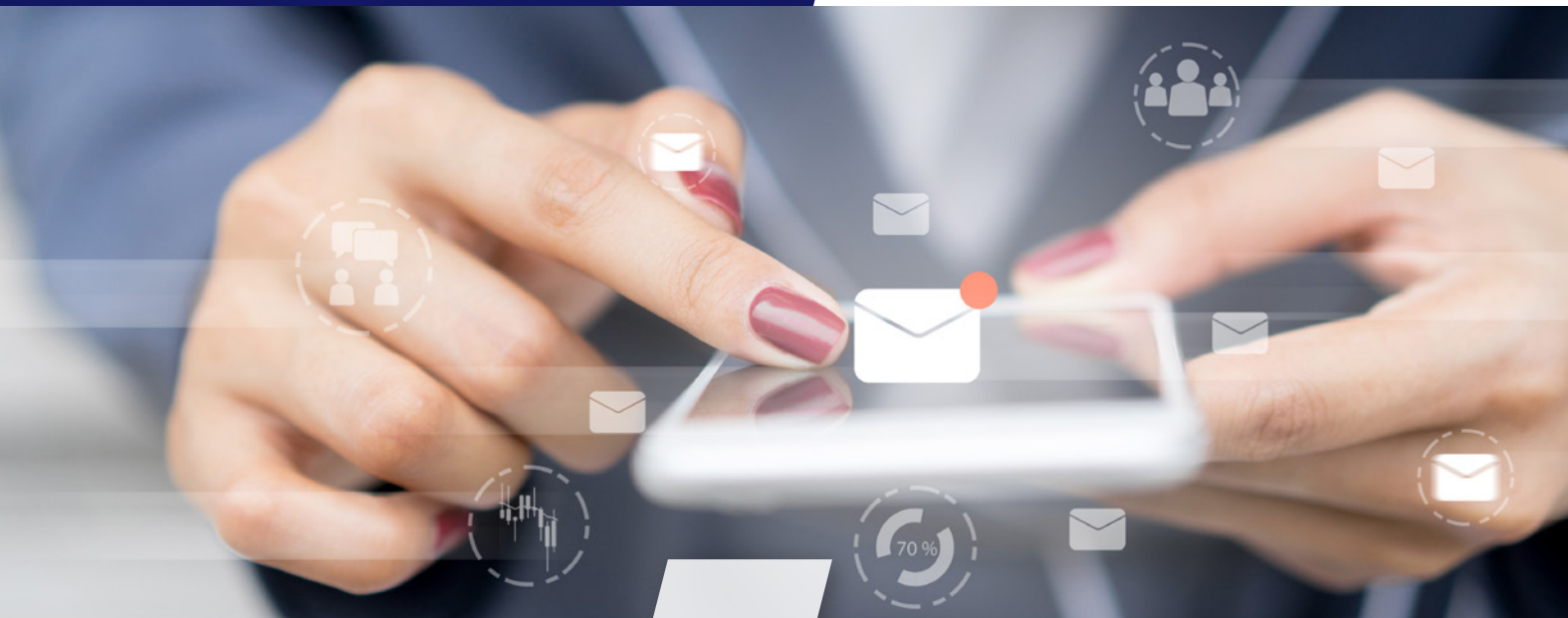
It holds a leading global position in the markets for high performance films for your credit cards and travel documents. The company is focused on high quality value added products, strong customer relationship, R&D and excellent service.



High Quality Films manufacturer  
for Banking and ID Cards since 1953



# Product guide



## our skills



Direct contact with the customer



First choice for innovative solutions



Technical and sales team fully dedicated to the cards market



Wide product portfolio



Passion and flexibility



Continue improvements to become the most efficient producer of high quality products

BY FINAL USE		SICOSMART	SICOFFSET	SICOFFSET COATED	SICOLEX	SICOECO	SICO-R	SICOREG	SICOPLAST
Secure	Financial (contact dual)	■		■		■	■		■
	SIM	■							
	Government/Health	■							■
	Access control		■	■		■	■		
	ID membership		■	■	■	■	■		■
	Biometric cards	■		■					■
	Inlay	■	■			■	■		■
Non secure	Gift				■	■	■	■	■
	Transportation		■	■		■	■		■
	Retail/Gas			■	■	■	■	■	■
	Unprinted blanks		■		■	■	■		■
	Loyalty/Promo		■	■	■	■	■	■	■

BY PRODUCTION PROCESS		SICOSMART	SICOFFSET	SICOFFSET COATED	SICOLEX	SICOECO	SICO-R	SICOREG	SICOPLAST
Printing method	UV invisible	■							■
	Offset	■	■		■	■	■	■	
	Digital			■					
	Toner	■	■	■	■	■			
	Screen	■	■		■	■	■	■	■
	Inkjet (solvent inks)	■	■		■	■	■	■	■
Personalization	Chip embedding capability	■	■	■		■	■		
	Hologram hot stamp								■
	Re transfer								■
	Thermo transfer								■
	Laser								■
	D2T2								■
Sustainability requirements	Degradable material					■			
	Recycled material						■		
	Regrinded material							■	
Compatibility	Metallic foil								■
	PC	■	■						■
	PETF	■							■

# Sicosmart

- White and colored PVC films
- Excellent quality and tight tolerances
- Excellent printability on both sides
- Several formulations available designed for long life cards (5-10 or more years)

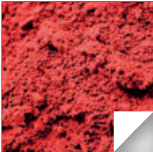
THICKNESS TOLERANCES	90-99 µm	± 15% on 100% of readings
	100-149 µm	± 10% on 100% of readings
	150-179 µm	± 5% on 100% of readings
	180-299 µm	± 3% on 90% of readings
	300-820 µm	± 3% on 100% of readings
SURFACE	Surface 6060 (opaque)	Ra 1,4 - 2,2 µm (cut-off 2,5 mm)
	Surface tension (core)	Best printing side > 40 dynes/cm
		Reverse side > 37 dynes/cm
COLOR TOLERANCES	Colored opaque	Delta E max 1,5
	White	Delta E max 1 and Delta L,a,b max 0,8
DIMENSIONS	Size tolerance	± 0,5 mm
	Squareness tolerance	± 1 mm/m
	Reel width tolerance	± 1 mm

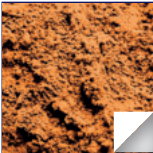
PVC	986_T0	227_T0	307_T1*
Thickness µm	90-400	100-410	100-820
VICAT A50	74 ± 2°C	81 ± 2°C	83 ± 2°C
VICAT B50	68 ± 2°C	77 ± 2°C	80 ± 2°C
Recommended colors	1176 white	1173 bluish white 1140 high opacity 1356 bluish high opacity	1173 bluish white 1357 bluish white

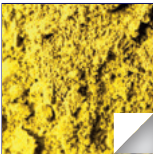
ABS-PVC	817_T0	C35_T0	C38_T0*
Thickness µm	100-820	150-820	130-400
VICAT A50	82 ± 2°C	98 ± 2°C	98 ± 2°C
VICAT B50	78 ± 2°C	95 ± 2°C	95 ± 2°C
Recommended colors	1190 yellowish white	1565 yellowish white	1668 white

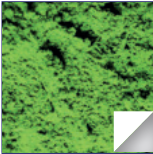
\* Designed for long life cards

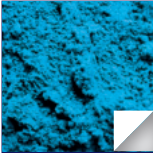
# Sicosmart colors

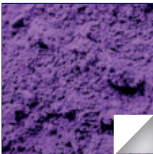
	Red	PMS	186 C	193 C	805 C neon	805 C no fluo
		COLOR	4927	4926	4933	4096


	Orange	PMS	144 C	152 C	165 C	804 C	2024 C	NA
		COLOR	3326	3913	3324	3321	3323	3319-3912

	Yellow	PMS	101 C	113 C	116 C/123 C	123 C	125 C	611 C
		COLOR	2862	2864	2861	2863	2870	2871

	Green	PMS	328 C	349 C	368 C	340 C	389 C	361 C	341 C
		COLOR	7234	7227	7229	7231	7966	7968	7226

	Blue	PMS	Process cyan	Process blue C	285 C	287 C	299 C	300 C
		COLOR	6966-6970	6967	6017	6973	6972	6015

	Violet	PMS	229 C	2627 C
		COLOR	5952	5951

	Black	PMS	Grey	Black
		COLOR	9684	9812

# Sicoffset

- White and transparent PVC films
- High quality and tolerances
- High printability on both sides
- Digital printing version
- Several formulations available

THICKNESS TOLERANCES	90-99 µm	± 15% on 100% of readings
	100-170 µm	± 10% on 100% of readings
	171-820 µm	± 5% on 100% of readings
SURFACE	Surface 6060 (opaque)	Ra 1,4 - 2,2 µm (cut-off 2,5 mm)
	Surface 5050 (clear)	Ra 0,7 - 1,4 µm (cut-off 2,5 mm)
	Surface tension (core)	Best printing side > 40 dynes/cm
		Reverse side > 36 dynes/cm
COLOR TOLERANCES	White opaque	Delta E max 1
	Clear	Visual
DIMENSIONS	Size tolerance	± 1 mm
	Squareness tolerance	± 1,2 mm
	Reel width tolerance	± 1 mm

OPAQUE	785_00	986_00	347_00	227_00	307_00
Thickness µm	100-400	90-400	100-410	100-410	100-820
VICAT A50	56 ± 2°C	74 ± 2°C	77 ± 2°C	81 ± 2°C	83 ± 2°C
VICAT B50	NA	68 ± 2°C	73 ± 2°C	77 ± 2°C	80 ± 2°C
Recommended colours	1955 white	1176 white	1173 bluish white	1173 bluish white 1140 high opacity 1356 bluish high opacity	1173 bluish white 1880 yellowish white

CLEAR	157_R1	207_R1	765_R1*	207_R2*
Thickness µm	100-380	100-380	100-380	100-380
VICAT A50	74 ± 2°C	81 ± 2°C	75 ± 2°C	81 ± 2°C
VICAT B50	68 ± 2°C	77 ± 2°C	NA	77 ± 2°C
Recommended colours	0073 clear bluish 0078 UV stable	0034 clear	K073 clear bluish	K073 clear bluish

\* Designed for long life cards

# Sicoffset coated

THICKNESS TOLERANCES	100-170 µm	± 10% on 100% of readings
	171-410 µm	± 5% on 100% of readings
SURFACE	Surface 6060 (opaque)	Ra 1,4 - 2,2 µm (cut-off 2,5 mm)
	Surface 5050 (clear)	Ra 0,7 - 1,4 µm (cut-off 2,5 mm)
	Surface tension (core)	Best printing side > 40 dynes/cm
		Reverse side > 36 dynes/cm
COLOR TOLERANCES	White opaque	Delta E max 1
	Clear	Visual
DIMENSIONS	Size tolerance	± 0,5 mm
	Squareness tolerance	± 1 mm
	Reel width tolerance	± 1 mm

DIGITAL PRINTING	157_BC	287_B7	307_B7	C20_B7
Thickness µm	100-380	100-400	120-400	100-410
VICAT A50	74 ± 2°C	75 ± 2°C	83 ± 2°C	95 ± 2°C
VICAT B50	68 ± 2°C	69 ± 2°C	80 ± 2°C	91 ± 2°C
Recommended colors	0073 clear	1173 bluish white 1140 high opacity	1173 bluish white	1614 fluorescent white
Recommended coatings	DPC1L1 (one side coated)	DPC1L1 (one side coated)	DPC1L2 (double side coated)	DPC1L1 (one side coated) DPC1L2 (double side coated)





# Sicoeco

- Degradable PVC Films
- White, transparent and colored
- Printable on both sides
- External protective layer (overlay) available (coated or uncoated)
- Several formulations available

THICKNESS TOLERANCES OVERLAY	50-59 µm	± 12% on 100% of readings
	60-79 µm	± 10% on 100% of readings
	80-99 µm	± 8% on 100% of readings
	100-119 µm	± 6% on 100% of readings
	> 120 µm	± 5% on 100% of readings
THICKNESS TOLERANCES CORES	150-170 µm	± 10% on 100% of readings
	171-810 µm	± 5% on 100% of readings
SURFACE	Surface 6060 (opaque)	Ra 1,4 - 2,2 µm (cut-off 2,5 mm)
	Surface 5050 (clear)	Ra 0,7 - 1,4 µm (cut-off 2,5 mm)
	Surface tension (core)	Best printing side > 40 dynes/cm
		Reverse side > 36 dynes/cm
COLOR TOLERANCES	White opaque	Delta E max 1
	Clear	Visual
DIMENSIONS	Size tolerance	± 1 mm
	Squareness tolerance	± 1,2 mm
	Reel width tolerance	± 1 mm

	CORES			OVERLAYS	
	H37_00	H03_00	H57_R1	H67_00	H67_B0
Thickness µm	100-410	200-820	100-380	50-300	50-300
VICAT A50	78 ± 2°C	83 ± 2°C	74 ± 2°C	74 ± 2°C	74 ± 2°C
Recommended colors	1253 white	1253 white	0073 clear bluish	K081 clear K010 laserable	K081 clear K010 laserable

# Sico-R

- Film made with 100% Recycled PVC
- Printable on both sides
- External Protective layer (overlay) available (coated or uncoated)

THICKNESS TOLERANCES OVERLAY	80-99 µm	± 10% on 100% of readings
	100-120 µm	± 8% on 100% of readings
THICKNESS TOLERANCES CORES	200-710 µm	± 7% on 100% of readings
SURFACE	Surface 6060 (opaque)	Ra 1,4 - 2,2 µm (cut-off 2,5 mm)
	Surface 5050 (clear)	Ra 0,7 - 1,4 µm (cut-off 2,5 mm)
	Surface tension (core)	Best printing side > 38 dynes/cm
		Reverse side > 36 dynes/cm
COLOR TOLERANCES	White 1897	Delta E max 5
	Clear	Visual
DIMENSIONS	Size tolerance	± 1,5 mm
	Squareness tolerance	± 1,5 mm
	Reel width tolerance	± 1,0 mm



# Sicoreg

- Films made with max 40% virgin PVC
- White opaque PVC films
- Printable on both sides

THICKNESS TOLERANCES	280-800 µm	± 8% on 100% of readings for loyalty/gift cards
SURFACE	Surface 6060 (opaque)	Ra 1,4 - 2,2 µm (cut-off 2,5 mm)
	Surface tension (core)	Best printing side > 40 dynes/cm
		Reverse side > 36 dynes/cm
COLOR	White 1411	Delta E max 5
DIMENSIONS	Size tolerance	± 1,5 mm
	Squareness tolerance	± 1,5 mm

# Sicoplast

- High transparent PVC external protective layer (overlay)
- Excellent flex performances
- Smooth roughness for easy lamination
- Coated or uncoated
- Different coating types available
- Laser engraving version available

THICKNESS TOLERANCES	40-49 µm	± 15% on 100% of readings
	50-59 µm	± 12% on 100% of readings
	60-79 µm	± 10% on 100% of readings
	80-99 µm	± 8% on 100% of readings
	100-119 µm	± 6% on 100% of readings
	120-299 µm	± 5% on 100% of readings
SURFACE	Surface 5050 (clear) Ra 0,7 - 1,4 µm (cut-off 2,5 mm)	
COLOR TOLERANCES	Visual	
DIMENSIONS	Size tolerance	± 1 mm
	Squareness tolerance	± 1,2 mm
	Reel width tolerance	± 1 mm

GRADES	UNCOATED		COATED	
	167_00	147_00	167_B0	147_B0
Thickness µm	50-300	40-299	50-300	40-299
VICAT A50	74 ± 2°C	79 ± 2°C	74 ± 2°C	79 ± 2°C
Recommended colors	0073 clear bluish	0073 clear bluish	0073 clear bluish	0073 clear bluish
	0083 laserable		0083 laserable	

COATING TYPES	LOW TEMPERATURE	HIGH TEMPERATURE	SPECIAL APPLICATION
Lamination temperature range	120-145°C	140-165°C	110-140°C
Standard printed surfaces	S1L1	HP1L1	U1L1
Fully printed surfaces bonding	LT2L1	HP2L1	

# Special overlays

- PVC Overlay with excellent flex performances

THICKNESS TOLERANCES	50-59 µm	± 12% on 100% of readings
	60-79 µm	± 10% on 100% of readings
	80-99 µm	± 8% on 100% of readings
	100-119 µm	± 6% on 100% of readings
	120-299 µm	± 5% on 100% of readings
SURFACE	Surface 5050 (clear) Ra 0,7 - 1,4 µm (cut-off 2,5 mm)	
COLOR TOLERANCES	Visual	
DIMENSIONS	Size tolerance	± 1 mm
	Squareness tolerance	± 1,2 mm
	Reel width tolerance	± 1 mm

GRADES	UNCOATED	COATED
	735_00	735_B0
Thickness µm	50-299	50-299
VICAT A50	80 ± 2°C	80 ± 2°C

RECOMMENDED COLORS	STANDARD	STD + ANTIAGING + UV NEUTRAL
Standard	K073 bluish	K107
Laserable	K083	K008 (70-89 µm) K009 (110-159 µm)

- PVC Overlay film for foil cards

THICKNESS TOLERANCES	60 µm	± 10% on 100% of readings
SURFACE	Surface 2020 (glossy)	glossy/glossy
COLOR TOLERANCES	Visual	
DIMENSIONS	Size tolerance	± 1 mm
	Squareness tolerance	± 1,2 mm
	Reel width tolerance	± 1 mm

GRADES	UNCOATED		COATED HO2L1**	
	740_00		740_B0	
Thickness µm	60		60	
VICAT A50	82 ± 2°C		82 ± 2°C	
Available colors	K040 clear	K043 laserable	K040 clear	K043 laserable

\*\* Lamination temperature 140°C - 165°C

# Sicolex

- White PVC film
- Standard quality and tolerances
- Printable on both sides

THICKNESS TOLERANCES	200-800 µm	± 5% on 100% of readings
SURFACE	Surface 6060 (opaque) Surface tension (core)	Ra 1,4 - 2,2 µm (cut-off 2,5 mm) Best printing side > 38 dynes/cm Reverse side > 36 dynes/cm
COLOR TOLERANCES	White opaque Colored	Delta E max 1,5 Visual
DIMENSIONS	Size tolerance Squareness tolerance	± 1,5 mm ± 1,5 mm

OPAQUE	S46_00	S04_00
Thickness µm	200-410	250-820
VICAT A50	77 ± 3°C	83 ± 3°C
VICAT B50	73 ± 3°C	80 ± 3°C
Available colors	1863 bluish white	1863 bluish white

SET UP	S66_00
Thickness µm	200-840
VICAT A50	NA
Available colors	Yellow - Rainbow

# Storage shelf life

## Transport and stacking instructions

### UNCOATED FILMS

- No stacking for horizontal reels packaging
- Max 2 stacked pallets for vertical reels packaging (according to reels distribution on the pallet)

### COATED FILMS IN SHEETS

- No stacking

### UNCOATED FILMS IN SHEETS

- Up to 2 stacked pallets

### MAX ALLOWED WEIGHT during stacking

- 1200 kg for not reusable pallets (wooden or plastic)
- 1800 kg for reusable plastic pallets

## Storage conditions

### PVC and PVC/ABS are sensitive to cold

- To be stored in the original packaging at temperatures > 15°C up to 30°C (> 59°F up to 86°F) and 40-60% max relative humidity
- Avoid exposure to moisture and direct sunlight
- Conditioning 24-48 hours before using at room temperatures (15-30°C/59-86°F)
- Stock rotation is recommended

## Product shelf life

### UNCOATED FILMS

- Max 24 months from production-date (shown on the label), kept in the original packaging and stored according to the guidelines above

### COATED FILMS

- Max 12 months from production-date (shown on the label), kept in the original packaging and stored according to the guidelines above
- Suitability test for purpose after that period is strongly recommended

Values presented have been determined by standard test methods and are average values not to be used for specification purposes.  
Our recommendations on the use of our products are based on tests believed to be reliable but we would advise you to conduct your own test to determine their suitability for your applications.  
This is because we cannot accept any responsibility or liability direct or consequential for loss or damages as results of our recommendations.