

KIMVA

Additive Manufacturing by ARMOR





1. ABOUT KIMYA

WHY KIMYA?

Kimya originates from the Arab word الكيمياء, alkīmiyā, from which the word alchemy derives. The goal is to combine additive manufacturing with this art of transmuting metals. Our name is evocative, it carries the promise of transformation from initial material to something wonderful: the 3D material becomes the finished object.

OUR MISSION

To offer solutions to specific needs of industrialists and 3D printer manufacturers thanks to materials formulated and developed on demand.

With its Kimya offer, ARMOR commits to additive manufacturing stakeholders by offering 3D material solutions whose precision and tailored formulation perfectly support the production process and the expected use value of the produced object.

To achieve this ambition, we employ the expertise of a multi-disciplinary team of engineers and technicians: materials, formulation, transformation, process and 3D printing.

OUR EXPERTISE



Portfolio products and on-demand materials



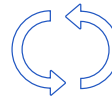
Dedicated R&D laboratories and teams



Chemical manufacturer since 1922



Co-industrialisation partner



Range of products from the circular economy



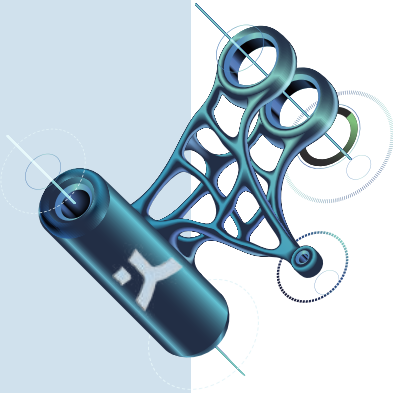
Compliant with industrial certifications and standards





2. EMBEDDING ADDITIVE INTO MANUFACTURING

KIMYA is developing a 360° vision and is committing to its industrial clients and printer manufacturers by offering three products & services packages:



KimyaLab

- Specific development
- Characterisation laboratory
- Customize production lines

To formulate and produce custom materials in accordance with a set of specifications agreed with a team of chemists based at the production site in Nantes (France).



KimyaMaterials

- Kimya technical filaments
- Eco-designed filaments
- Collection program

A range of technical materials for professionals as well as a range of eco-designed filaments, combined with a collection service for your 3D print waste (available via our distribution network).



KimyaFactory

- 3D print services
- Training
- Design and modelling support

To support professionals in their additive manufacturing projects for the production of prototypes and preproduction.



3. MATERIAL APPLICATIONS

PROPERTIES	ABS CARBON	ABS-ESD Natural	ABS KEVLAR	PC-S	PEI-1010 ^a	PEI-9085 ^a	PEKK-A ^a	PEKK CARBON	PETG CARBON
Ease to print	**	**	**	**	**	**	**	**	***
Shrinkage (No, Low, Yes)	L	L	L	L	N	N	N	N	N
Rigid	**	*	**	**	***	***	**	**	***
Elasticity	*	**	*	**	**	**	**	**	*
Impact Strenght	*	**	*		*	*	*	*	**
Hydrophobic	**				*	*	***	***	**
Solvent resistance	**	**	**	**	***	***	***	***	**
Abrasion resistance	**	*	**		*	*	***	***	
UV resistance	*		*		***	***	***	***	**
Weather resistance					**	**	***	***	**
CERTIFICATIONS	ABS CARBON	ABS-ESD Natural	ABS KEVLAR	PC-S	PEI-1010 ^a	PEI-9085	PEKK-A ^a	PEKK CARBON	PETG CARBON
RoHS	N	Y	N	Y	Y	Y	Y	N	N
EU 10/2011	N	N	N	N	N	N	N	N	N
FDA	N	N	N	Y	N	N	N	N	N
UL94 - V0 ^c	N	N	N	N	Y	Y	Y	Y	N
ESD protection	N	Y	N	N	N	N	N	N	N
	ABS CARBON	ABS-ESD Natural	ABS KEVLAR	PC-S	PEI-1010 ^a	PEI-9085	PEKK-A ^a	PEKK CARBON	PETG CARBON
PROS	Better interlayer adhesion, no shrinkage, light-weighted, better tensile modulus and abrasion resistance than ABS.	Good flexibility and impact resistance, easy to print, ESD protection.	Smooth surface, light-weighted, low warping, No Shrinkage.	High temperature resistant (140°C), sterilizable, food contact certified.	High temperature resistant, Chem T., flam retardant, excellent dimensional stability.	High temp. resistant, Chem T., excellent dimensional stability, flame retardant : UL94 V0 & FAR 25.853	Easier to print compared to PEEK and PEI High temp. R., Chem T., flam retardant.	Easier to print compared to PEEK and PEI, high temp. R., Chem T., flam retardant, abrasion resistant	Possible post-production, humidity resistance.
CONS		Sensitive to humidity and UV rays	Sensitive to humidity and UV rays	Sensitive to humidity and UV rays	Higher temperature printer required than PEKK and PEEK.	High temperature printer required			Abrasive; sensitive to UV rays.

^a Based on injected plates, printed parts are in progress

^b Depending on colors, please for more information contact us

^c UL 94 is the standard for safety of flammability of plastic materials. From lowest (least flame-retardant) - to highest (most flame-retardant) HB < V2 < V1 < V0 < 5VB < 5VA .

PROPERTIES	PETG-S	PLA-HI	PLA-R	PLA-S	PPSU-S	PS	TPC-91A	TPU-92A
Ease to print	***	*****	*****	*****	**	***	***	***
Shrinkage (No, Low, Yes)	N	N	N	N	N	L	N	N
Rigid	**	**	**	**	***	**	*	*
Elasticity	**	*	*	*	**	**	****	***
Impact Strength	*	**	*	*	***	*	***	***
Hydrophobic	**	*			***	**	***	***
Solvent resistance	**				***	**	***	***
Abrasion resistance					*	*	***	***
UV resistance	**				***		***	***
Weather resistance	**				**		***	***
CERTIFICATIONS	PETG-S	PLA-HI	PLA-R	PLA-S	PPSU-S	PS	TPC-91A	TPU-92A
RoHS	Y	N		Y		N	N	Y
EU 10/2011	Y	Y	N	Y	N	N	N	Y
FDA	Natural only	N	N	N	N	N	N	Y (except black)
UL94 - V0 ^c	N	N	N	N	Y	N	N	N
	PETG-S	PLA-HI	PLA-R	PLA-S	PPSU-S	PS	TPC-91A	TPU-92A
PROS	Odorless, no shrinkage, high flexibility and impact strength, food contact, hydrophobic.	Sensitive to UV rays and scratches.	≥ 99 % Recycled material, ≥ 99 % Biosourced material, easy to print, odorless.	Odorless; biosourced material; easy to print; no heat-bed needed.	High temp. R., Chem T., Flam retardant, impact resistant, resistance to hydrolysis.	Partly recycled, smooth surface, easy post-production, fast printing.	Elongation > 500%, easy to print, printability.	Resistant to solvents, elastic.
CONS	Sensitive to UV rays and scratches.	Sensitive to UV rays and scratches.	Sensitive to humidity and UV rays.	Sensitive to humidity and UV rays; medium durability; hard post-production.	High temperature printer required.			

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4. PRINTING SETTINGS AND TECHNICAL PROPERTIES

PRODUCTS	GLASS TRANSITION TEMP.	MELTING TEMP.	MAX TEMP. USAGE	DENSITY	RESISTANCE TO IMPACT	ELONGATION AT BREAK	MODULE TRACTION	MODULE BENDING	HARDNESS SHORE
	Tg	Tf		ISO 1183	ISO 179	ISO 527	ISO 527	ISO 178	ISO 868
	DSC	DSC			Charpy	5A	5A		
	°C	°C	°C	g/cm ³	Notched	50mm/min	1mm/min		
					kJ/m ²	%	MPa	MPa	
ABS CARBON	100	-	90	1.032	7.3	3.1	2,189	1,822	72.2D
ABS-ESD Natural	107	-	90	1.03	10.9	6.4	1,121	856	66.7D
ABS KEVLAR	100	-	90	1.037	8.86	4.9	1,775	1,509	65.2D
PC-S	140	-	140	1.193	7.9	4.8	2,172	1,640	79.2D
PEI-1010 ^a	215	-	200	1.27	10	60	3,200	3,300	-
PEI-9085 ^a	217	-	170	1.34	11	-	-	-	-
PEKK-A ^a	159	308	150	1.261	2.5	>5	2,510	1,660	-
PEKK CARBON ^a	160	300	< 260	1.27	5.0	80	2,900	3,000	-

PRINTING SETTINGS	Extrusion Temperature	Bed Temperature	Chamber Temperature	Printing speed	Recommended bed surface
	°C	°C	°C	mm/s	
ABS CARBON	250-270 (260)	90-110 (100)	Without 70-80	40-70 (50)	Glass + adhesive product or PEI
ABS-ESD Natural	250-270 (260)	100	Without or 70	40	Glass + adhesive product or PEI
ABS KEVLAR	250-270 (260)	90-110 (100)	Without or 70	40-70 (50)	Glass + adhesive product or PEI
PC-S	280-320 (295)	100-120 (105)	Without or 70	40-70 (45)	Glass + adhesive product (dimafix)
PEI-1010 ^a	360-400	140-170	100-120	100-120	Glass or PEI
PEI-9085 ^a	350-380	120-160	100-120	20-35	Glass or PEI
PEKK-A ^a	350-400	110-170	Without or up to 120	20-40	Glass + PET tape
PEKK CARBON ^a	350-390	110-150	Without or up to 120	20-40	Glass + PET tape
PETG CARBON	220-260	60-100	Without 70-80	40-70 (50)	Glass + blue tape 3M or PEI + blue tape

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	GLASS TRANSITION TEMP.	MELTING TEMP.	MAX TEMP. USAGE	DENSITY	RESISTANCE TO IMPACT	ELONGATION AT BREAK	MODULE TRACTION	MODULE BENDING	HARDNESS SHORE
PRODUCTS	Tg	Tf		ISO 1183	ISO 179	ISO 527	ISO 527	ISO 178	ISO 868
	DSC	DSC			Charpy	5A	5A		
					Notched	50mm/min	1mm/min		
	°C	°C	°C	g/cm ³	kJ/m ²	%	MPa	MPa	
PETG-S	80	-	70	1.274	4	24.3	1,833	1,641	72.5D
PLA-HI	60	156	55	1.210	16.5	4.2	2,491	2,097	76.8D
PLA-R	61	150	55	1.24	3.22	4.0	2,963	2,675	79.1D
PLA-S	60	155	55	1.246	3.5	3.2	2,862	2,285	77.3D
PPSU-S	220	-	180	1.29	-	-	-	-	-
PS	96	-	85	1.009	7.5	18.3	1,679	1,526	74.7D
TPC-91A	-	159	125	1.22	No break	> 500	67	66	91A
TPU-92A	-	-	-	1.159	No break	351.6	90	81	92A
PRINTING SETTINGS	Extrusion Temperature		Bed Temperature		Chamber Temperature		Printing speed		Recommended bed surface
	°C		°C		°C		mm/s		
PETG-S	195-230 (225)		35-60 (60)		-		40-70 (50)		Glass + blue tape 3M or PEI + blue tape
PLA-HI	190-210 (200)		20-60 (60)		-		40-150 (50)		Glass + blue tape 3M or PEI + blue tape
PLA-R	190-210 (200)		20-60 (60)		-		40 - 150 (50)		Glass + blue tape 3M or PEI + blue tape
PLA-S	190-210 (200)		20-60 (60)		-		40-150 (50)		Glass + blue tape 3M or PEI or Buildtak
PPSU-S	360-400		140-170		100-120		15-30		Glass or PEI
PS	200-260 (250)		60-100 (95)		-		40-150 (50)		Glass + adhesive product or PEI
TPC-91A	230-270 (260)		60-85 (60)		-		20 - 60 (44)		Glass + blue tape 3M or PEI + blue tape
TPU-92A	210-250 (225)		20-90 (85)		-		20-70 (25)		Glass + blue tape 3M or PEI + blue tape

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KIMYA, EMBEDDING ADDITIVE INTO MANUFACTURING



Kimya Materials

Kimya Lab

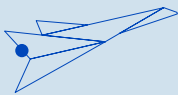
Kimya Factory

ADDITIVE MANUFACTURING SOLUTIONS FOR ALL ACTIVITIES

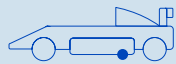
With continually improving technology, 3D printing solutions to the needs of industry are getting better and better, and relieve the biggest actors of the constraints which their manufacturing processes have always been subject to.

The objective?

Increased reactivity and autonomy. With the Kimya's 3D materials, reducing the costs of large-scale production and storage is immediately achievable. The result of fine-tuned production: an increase in profits and on-demand manufacturing without the risks.



Aeronautics



Automotive



Railway



Luxury



Medical



5. KIMYA PARTNERS

Kimya works in collaboration with 3D printer manufacturers and chemists to serve international industrial groups.

Industrial customers

ALSTOM

Continental

AIRBUS

Specialty chemicals company

ARKEMA
INNOVATIVE CHEMISTRY

High temperature 3D printer manufacturers

MINIFACTORY

3DGENCE

don3D

3ntr
ADDITIVE MANUFACTURING SYSTEMS

HAGE3D

Dynamical
3D

Lynxter

CINCINNATI

Kimya filaments certifications

Ultimaker

RAISE3D
RAISE THE STANDARD

MakerBot



6. PRICE LIST 2019

Find our full range of technical and high performance materials:

FILAMENTS	MATERIAL	COLORS	DIAMETER (mm)	WEIGHT (g)	MSRP (EXC. TAXES)
ABS CARBON	ABS carbon fibers	●	1.75 / 2.85	500	48.00 €
ABS-ESD	ABS ESD Electrostatic	○	1.75 / 2.85	500	45.00 €
ABS KEVLAR	ABS aramid fibers	●	1.75 / 2.85	500	48.50 €
PC-S	Polycarbonate	○	1.75	750	39.00 €
PEBA-S	PEBA filament made from Arkema's PEBAX®	○	1.75	500	69.00 €
PEI-1010	PEI (ULTEM™ 1010)	●	1.75 / 2.85	500	298.00 €
PEI-9085	PEI (ULTEM™ 9085)	●	1.75 / 2.85	500	155.00 €
PEKK-A	PEKK filament made from Arkema's KEPSTAN® PEKK	●	1.75	500	365.00 €
PEKK CARBON	PEKK carbon fibers	●	1.75 / 2.85	500	430.00 €
PETG CARBON	PETG carbon fibers	●	1.75 / 2.85	500	51.00 €
PETG-S	PETG	5 colors	1.75 / 2.85	750	33.00 €
PLA-HI	Biosourced PLA-HI high impact	3 colors	1.75	750	37.46 €
PLA-R	Recycled PLA	6 colors	1.75 / 2.85	750	24.96 €
PPSU-S	PPSU	●	1.75	500	239.00 €
TPC-91A	Thermoplastic copolyester	5 colors	1.75 / 2.85	750	49.50 €
TPU-92A	TPU	2 colors	1.75	750	36.25 €

For any custom-made request or to find the list of our resellers: www.armor-group.com/kimya



7. ABOUT ARMOR GROUP

HUMANISM

CUSTOMER FOCUS

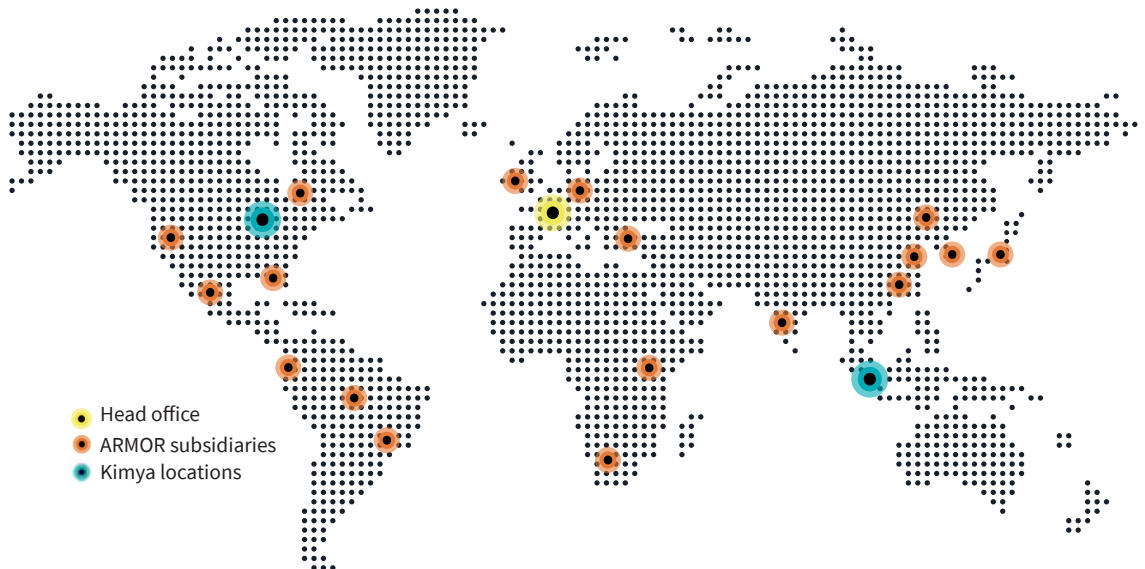
INNOVATION

COMMITMENT



We are passionate about integrating socially responsible innovation at the very heart of our business model

Hubert de Boisredon, ARMOR CEO.



7.1. KEY FIGURES

€256M
global turnover
(80% produced for export)

1900
Employees worldwide

Since 1922

26
Manufacturing
and logistics sites

€100M
Investments in R&D
(over the 2014-2018 period)

Nantes,
France
Head office

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