

CHEMISTRY THAT MATTERS™



AN INTRODUCTION OF LNP™ NMT SOLUTION

NOV 2022



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- Case Study

NMT SOLUTION BASIC INTRODUCTION

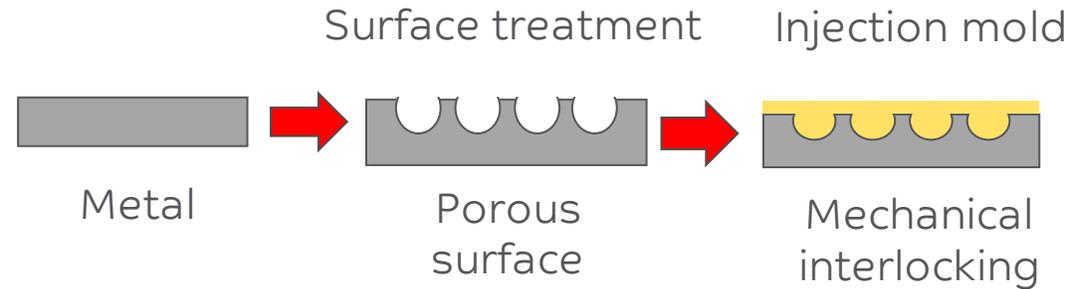
Types of Metal/Plastic Hybrid Design



What is NMT?

Nano molding technology (NMT) is an innovative technology wherein plastic resin is injected into metal surface which has been treated by the special chemical solution. This process is developed from the integration technology of metal and plastic. It is an excellent way to make key parts of consumer product and replace the traditional insert molding or die casting process.

Bonding Mechanism



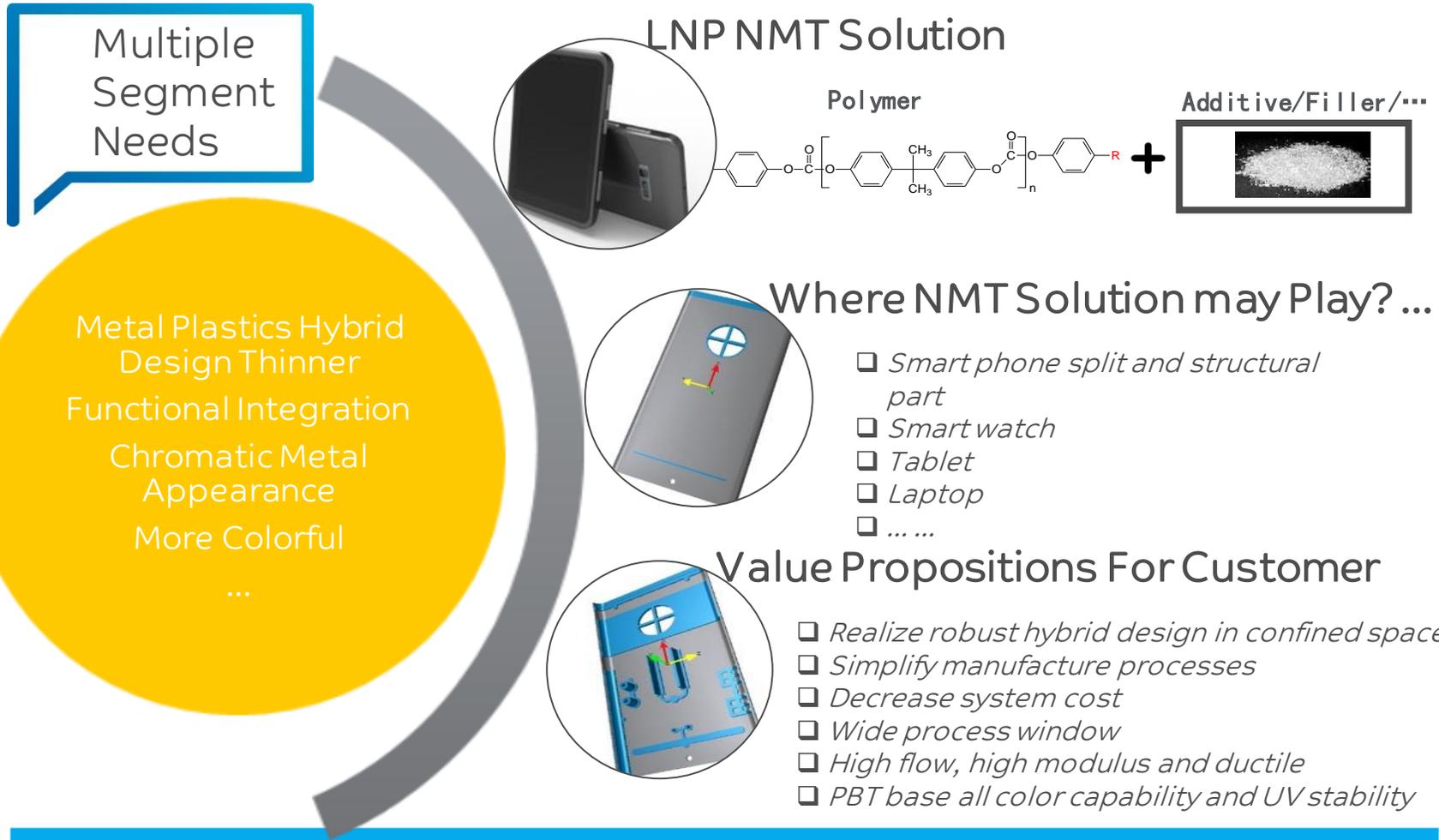
Customer Benefit

- Reduce product thickness and weight
- Excellent mechanical structure
- Achieve multi-functionalities
- Bonding strength reliability vs. glue adhesion
- Variety of surface decoration process alternatives



LNP™ THERMOTUF™ NMT COMPOUNDS INTRODUCTION & VALUE PROPOSITION

LNP™ NMT SOLUTION INTRODUCTION



LNP NMT Solutions Can Help Improve Smart Phone Hybrid Designs

LNP™ THERMOTUF™ NMT PRODUCT PORTFOLIOS

		Bonding Force	Dk	Df@ 1.9GHz	NII(J/m)	FM(MPa)	Key Feature	
LNP NMT Portfolio	PBT	WF006N	~30MPa (T) ~33MPa (TRI)	3.54	0.011	165	6600	Excellent impact , good warpage control
		WF006NIQ	~33MPa (T)	3.62	0.012	137	7700	>25% PCR, good warpage control
		WF008N	~34MPa(T) ~37MPa (TRI)	3.76	0.0096	145	11000	High modulus , good bonding force and color stability
		WF008NA	~38 MPa (TRI)	3.96	0.01	132	11100	High modulus, good impact, bonding force ,warpage control, and color stability
		WF008NXQ	~37 MPa (TRI)	3.84	0.0097	130	11000	High adhesive strength with glass screen , high modulus , high bonding force
	NEW!	WF008NiQ	~38 MPa (TRI)	3.97	0.012	150	10800	20% PCR version of WF008NXQ
		WF008NXPiQ	~38 MPa (TRI)	3.95	0.011	140	11200	10% PCR version of WF008NXQ, improved color stability
		WF009NA	~40 Mpa (TRI)	4.01	0.0077	120	13400	High modulus , good warpage control , high bonding strength (TRI)
		WF009NAR	~42 Mpa (TRI)	3.92	0.007	100	13700	High modulus, good surface, high bonding force (TRI)
		WF004N	~31 Mpa (T)	2.93	0.009	120	5300	Low DK(,=3.0), color stability
	PPS	OF006N	~45 MPa (T)	3.82	0.004	120	10200	High bonding strength, low warpage, FR V0-0.8 mm
		OF00AN	~40 MPa (T)	4.3	0.005	150	15200	High modulus and impact, low warpage, FR V0-0.4 mm

LNP™ ELCRIN™ WF008NIQ(ER009737) INTRODUCTION

A red rectangular badge with the word "NEW!" in white, tilted slightly upwards to the right.

LNP ELCRIN WF008NiQ(ER009737) compound is based on PBT resin utilizing ELCRIN iQ upcycling technology and containing 40% glass fiber targeted for NMT application, >20% Post Consumer Recycled content

Features:

- High adhesive strength with glass screen
- Chemical resistance
- High Stiffness
- Impact modified
- Sustainable (Advanced Recycling)

Potential Applications:

- Personal accessory
- Electrical devices and displays, Electrical components and infrastructure

LNP™ ELCRIN™ WF008NXPIQ(ER016388) INTRODUCTION

A red rectangular badge with the word "NEW!" in white, slanted text.

LNP ELCRIN WF008NXPIQ(ER016388) compound is based on PBT resin utilizing ELCRIN iQ upcycling technology and containing 40% glass fiber targeted for NMT application, >10% Post Consumer Recycled content

Features:

- High adhesive strength with glass screen
- Chemical resistance
- High Stiffness
- Impact modified
- Sustainable (Advanced Recycling)

Potential Applications:

- Personal accessory
- Electrical devices and displays, Electrical components and infrastructure

LNP™ THERMOTUF™ OF006N(ER015127) INTRODUCTION

A red rectangular badge with the word 'NEW!' in white, tilted slightly to the right.

LNP THERMOTUF OF006N(ER015127) compound is a 30% glass fiber reinforced PPS. Added features include: heat resistance and impact strength, excellent chemical resistance, low chloride contents, good warpage control and inherently flame-retardant.

Features:

- Flame Retardant
- Chemical resistance
- Low warpage
- Dimensional stability
- High temperature resistance

Potential Applications:

- Personal accessory
 - Electrical, Material handling
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LNP™ THERMOTUF™ OF00AN(ER010767) INTRODUCTION

A red rectangular badge with the word 'NEW!' in white, slanted upwards to the right.

LNP THERMOTUF OF00AN(ER010767) compound is a 50% glass fiber reinforced PPS. Added features include: heat resistance and impact strength, excellent chemical resistance, low chloride contents, good warpage control and inherently flame-retardant.

Features:

- Flame Retardant
- Chemical resistance
- Low warpage
- Dimensional stability
- High temperature resistance
- High Stiffness

Potential Applications:

- Electrical, Material handling

CASE STUDY

CASE STUDY - LNP™ THERMOTUF™ WF009NA COMPOUND

Application: Smart phone antenna splitter

Application Requirements:

- Bonding force: 40 MPa
- UL YC listing as HB at 0.7mm
- No whitening mark after injection
- Low warpage
- Good chemical leakage

Value Proposition with LNP THERMOTUF WF009NA Compound:

- Bonding force 42 MPa with TRI treatment
- Better chemical leakage performance
- Better whitening performance
- Better rigidity

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THANK YOU

