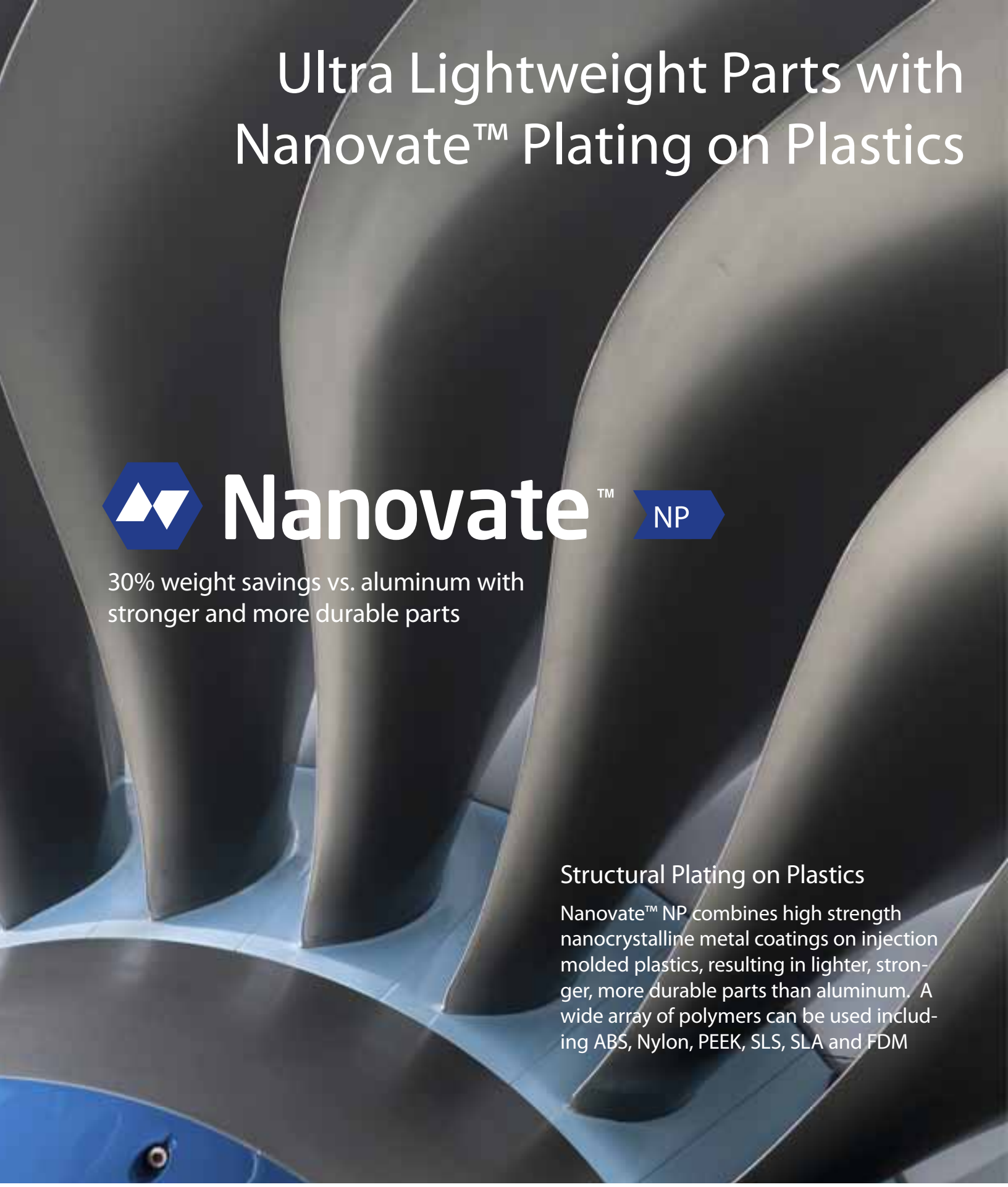


Ultra Lightweight Parts with Nanovate™ Plating on Plastics

Nanovate™ NP

30% weight savings vs. aluminum with stronger and more durable parts

Structural Plating on Plastics

Nanovate™ NP combines high strength nanocrystalline metal coatings on injection molded plastics, resulting in lighter, stronger, more durable parts than aluminum. A wide array of polymers can be used including ABS, Nylon, PEEK, SLS, SLA and FDM

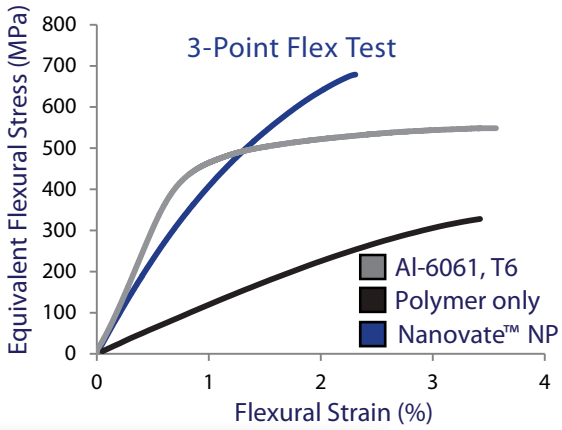
INTEGRAN | Tel: 416.675.6266 | integran.com crm@integran.com

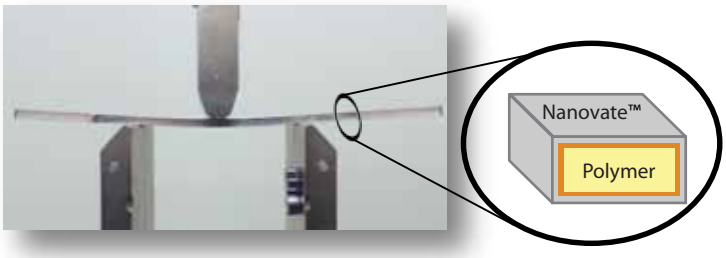
THE NEXT GENERATION OF HIGH PERFORMANCE MATERIALS

Nanovate™ NP

Stronger and Lighter than Aluminum . . .

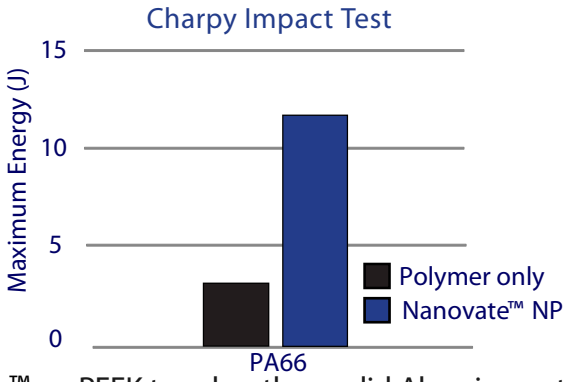
100 µm of Nanovate™ on GF Nylon comparable to Al with 30% reduction in weight





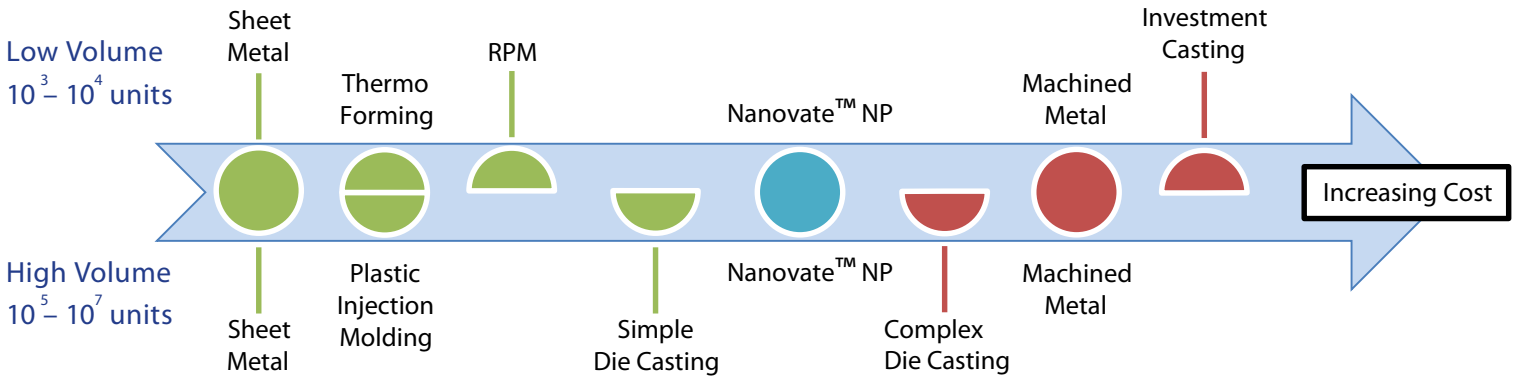
And More Durable

Nanovate™ adds impact resistance to polymers



Nanovate™ on PEEK tougher than solid Al on impact

Cost Comparison



Example Applications

Jet Engine Components

Aircraft Interiors

Consumer Electronics

Medical Devices

INTEGRAN

Call our engineers now to discuss your application at 416.675.6266

Replace Metal using Nanovate™ Structural Plating on Plastics

Design & Manufacturing Process

1 Design
A preliminary technical and commercial feasibility discussion followed by design feedback on CAD models. Corners are rounded to avoid build-up.

2 Plastic and Coating Selection
Optimizing for strength, weight, and functional properties the best plating grade polymer and Nanovate™ alloy complement is selected.

3 Injection Molding
The part is injection molded with no mold release and optimized for surface quality. Initial parts are checked for platability

4 Plastic Activation
The part is activated using proprietary processes for the selected polymer and is ready for the first metallic layer

5 Copper Plating
The activated part is given a thin layer of copper to act as a conductive base ready for the Nanovate™ process

6 Nanovate™ Plating
The key step in the manufacturing process, Nanovate™ is applied providing the structural and functional properties for the part. The coating thickness is typically 30 - 100 µm

7 Finishing
If required a thin layer of chrome, clear coat, paint, or a variety of other finishes can be applied

Applications

PING

Abu Garcia

TRUE TEMPER

COMBAT

UNION BINDING CO.

Selective Plating

Paint masking over a well defined edge

Two-shot molding with plating and non-plating polymer

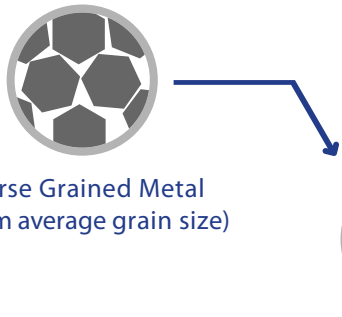
INTEGRAN | Tel: 416.675.6266 | integran.com | crm@integran.com

Nanovate™ NP

About Integran

Integran is a world leader in Nanocrystalline Metal Plating and has a 10 year track record of developing high performance coatings for military and environmental agencies.

Our nanotechnology enabled coatings take advantage of small grain size effects to provide superior performance at reduced weight vs conventional materials



Coarse Grained Metal
(10 µm average grain size)

Nanovate™ Metal
(10 -100 nm grain size)
5x Stronger

Integran's Toronto, Canada facilities include:

- R&D, prototyping and development facility
- ITAR compliant (Canadian controlled goods program)
- AS9100C certified by 2012
- Fully equipped test lab

Integran is also a leader in commercializing nanotechnology:

- Open to licensing for mass production opportunities
- Already licensed to manufacturing partners in Mexico and China

Nanovate™ NP is a Green Technology supported by SDTC

Platable Resins

ABS	PEI CF/GF
ABS-GF	PEEK CF/GF
Nylon	PPA
Nylon-GF	PPS
PAA	SLA
PAI	SLS

Featured Resins

DuPont™ Zytel® HTN53G40LWMF
Metafuse™ Nanometal/Polymer Hybrids

Victrex® PEEK™ 450CA30
Platable advanced engineering polymer

Harvest Technologies Nylon GF HST
Rapid prototyping polymer

Recent Awards

2011 JEC Innovation Award (w/ partner ACG)
2010 Frost & Sullivan's North American Enabling Technology of the year
2010 Boeing SURFAIR Innovation Award
2009 Lux Research Global Leader in Nano-coatings
2008 ASM Canada - Corporate Innovation Award

Selected Partners

Government and Defense

Commercial

CleanTech Initiatives

Integran Technologies Facility

Other Highlighted Technologies

CO

Functional Coatings

EM

Magnetic & EMI Shielding

NS

Composite Tube Liners