

METAL-TO-PLASTIC CONVERSION · A TECHNICAL GUIDE FOR OEM ENGINEERS

FROM METAL TO ENGINEERED PLASTIC

How OEM design and engineering teams can evaluate, justify, and execute successful metal-to-plastic conversions, from feasibility analysis through first-article validation.

ABSTRACT

Engineered plastics now replace metal in applications once considered off-limits for polymers. This paper examines the engineering science behind metal-to-plastic conversion, covering resin selection, structural redesign principles, design for manufacturability, total cost of ownership analysis, and a proven implementation roadmap. The goal is to give OEM engineers and procurement leaders a rigorous, practical framework for evaluating conversion opportunities across medium and heavy truck, powersports, HVAC, and industrial applications.

EXECUTIVE SUMMARY

THE CASE FOR CONVERSION

For decades, metal was the default material in demanding OEM applications. Not because it was always the right choice, but because engineered polymers had not yet matured enough to compete on performance. That calculus has changed. Hundreds of engineered polymer formulations now match or exceed metal across thermal, mechanical, and chemical performance axes, while offering capabilities metal cannot provide: part consolidation, integral design features, built-in corrosion resistance, and geometric freedom that unlocks improvements simply not possible in fabricated metal.

The financial case is equally strong. Industry programs across sectors report average total cost savings of 25 to 50 percent on successful conversions. The savings come not from cheaper raw material but from eliminating secondary machining, welding, coating, and multi-step assembly operations. Across the full production lifecycle, a well-executed conversion is rarely just a cost story. It is a performance, quality, and supply chain story.

RL Hudson's engineering team works with OEM design and procurement leaders to evaluate conversion opportunities from concept through production. This paper presents the technical and economic framework behind that process, along with outcomes from RL Hudson programs across heavy truck, powersports, HVAC, and industrial applications.

25-50% Total cost savings reported across industry conversion programs	40% Typical weight reduction vs. equivalent steel components	10× Longer average tooling life for injection molds vs. metal stamping dies	8→1 Metal components replaced by one molded part in a single heavy equipment OEM program
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SECTION 01

WHY CONVERSION WORKS: THE ENGINEERING SCIENCE

Metal-to-plastic conversion is not a materials substitution exercise; it is a redesign exercise. The goal is not to recreate a metal component in plastic, but to use engineered polymer properties to produce a component that performs better, costs less to manufacture, and simplifies assembly. Engineers who treat conversion as a direct material swap routinely hit manufacturability and performance problems; those who redesign for polymer mechanics from the start get better outcomes on every dimension.

Modern engineering resins have closed the gap with metal. Glass-fiber-reinforced nylon (PA66-GF30) reaches tensile strengths above 180 MPa, near mild steel, at roughly one-sixth the weight. Polyphenylene sulfide (PPS) handles continuous service at 200 to 220°C with near-zero moisture absorption, outperforming many cast alloys in underhood environments. Polyphthalamide (PPA) extends nylon's range above 150°C, where standard PA66 would soften.

Injection molding enables geometric complexity metal fabrication cannot economically match: integral snap features, undercuts, draft-optimized ribs, overmolded inserts, and walls as fine as 0.030 inches, all in one cycle with no secondary operations. Where a metal assembly needed welding, grinding, painting, and multi-piece fastening, a properly designed molded part arrives ready to install

PART CONSOLIDATION

Collapsing multi-component metal assemblies into a single molded part removes structural weak points (weld zones) and reduces assembly labor, tolerance stack-up risk, and failure exposure with every fastener eliminated.

Two RL Hudson programs illustrate this: a throttle coupling program for a medium and heavy duty truck OEM that replaced a six-piece metal assembly with one molded component, and a hydraulic access port cover program for a major heavy equipment OEM that consolidated eight metal parts into one, saving \$50 per assembly at production volume. Full program detail appears in the case evidence in Section 06.

WEIGHT REDUCTION: BEYOND THE PART ITSELF

The weight advantage of plastics over metal compounds across the program. At the material level, glass-fiber-reinforced PA66 weighs roughly 1.35 g/cm³ versus 7.8 g/cm³ for steel and 2.7 g/cm³ for aluminum. A structural plastic component designed for equivalent performance will typically weigh 40 to 60 percent less than its steel predecessor

Weight savings also compound when conversion eliminates secondary components required in metal design. A high-temperature PPA tube, for example, provides inherent thermal insulation that eliminates the need for a separate heat-protection sleeve around it. The conversion saves the tube weight, the sleeve weight, and the assembly labor for both.

CORROSION RESISTANCE AND FINISH ELIMINATION

Engineering plastics do not oxidize. They require no protective coating, primer, or plating to perform in aggressive environments. In heavy truck, HVAC, and marine applications where corrosion is a significant failure mode for metal components, this is a structural engineering advantage, not just a cost item. Pigment and UV stabilizer can be compounded directly into the resin, removing the paint line from the production process entirely.

KEY ENGINEERING ADVANTAGES

- ▶ **Part consolidation:** Multiple stamped or welded metal subcomponents redesigned into one molded part, removing assembly steps and weld-zone weakness.
- ▶ **Integral features:** Ribs, bosses, clips, threads, bearing surfaces, and fluid passages molded directly into the part with no secondary machining.
- ▶ **Corrosion resistance:** Engineering plastics do not oxidize, need no protective coating, and hold up well in high-humidity and chemically aggressive environments.
- ▶ **Cycle time:** A complex plastic component is molded in seconds. Equivalent metal fabrication at the same complexity takes minutes to hours per part.
- ▶ **Tooling longevity:** Injection molds average ten times the service life of stamping or die-cast tooling at comparable production volumes.
- ▶ **Design freedom:** Complex geometry that is cost-prohibitive to machine or stamp can be molded at no added per-part cost once the tool is built.
- ▶ **Color and finish:** Pigment is compounded into the resin. No painting, no coating, no rework from surface defects or chip-out.
- ▶ **Weight savings:** Engineered plastic components average 40 to 60 percent lighter than equivalent steel parts, with real fuel economy and payload benefits at the vehicle level.

SECTION 02

FEASIBILITY ASSESSMENT: WHEN CONVERSION CREATES VALUE

Not every metal part is a conversion candidate. The engineering team must evaluate five dimensions before committing to a conversion program. Moving too quickly on an unsuitable part is costly. Failing to convert a genuinely suitable part leaves real value unrealized.

DIMENSION	FAVORABLE	CAUTION	DISQUALIFYING WITHOUT MITIGATION
Thermal Load	Ambient to 150°C; cyclical rather than sustained; convective, not conductive	150 to 220°C sustained; thermal shock cycling; high CLTE mismatch risk	Continuous above 260°C; advanced high-temperature resin evaluation and validated thermal modeling required
Mechanical Load	Moderate static or dynamic load; fiber reinforcement viable; acceptable fatigue life	High cyclic impact; continuous fatigue loading; precision bearing or gear mesh loads	Extreme structural load paths requiring metal's ductile failure mode for safety compliance
Chemical Exposure	Water, engine oils, fuels, mild acids; most engineering resins perform well	Strong solvents; concentrated aromatic hydrocarbons; mixed aggressive streams	Aggressive chemical immersion without full qualification testing using PVDF or PPS
Production Volume	More than 5,000 units per year; tooling investment recovered within 18 to 24 months	1,000 to 5,000 units per year; multi-year amortization; bridge tooling may be viable	Fewer than 500 units per year without a bridge tooling or hybrid manufacturing strategy
Part Complexity	Multi-subcomponent assemblies; heavy secondary operations including welding, grinding, painting	Simple geometry with minimal secondary processing and low assembly labor content	Thin sections requiring metal's ductility; applications requiring electrical conductivity

The question is not whether plastic can handle the job. With the right resin and proper redesign, it almost always can. The real question is whether the total value gained in cost, weight, performance, and supply chain simplicity justifies the program investment.

WHEN THE ANSWER IS NO

Some applications genuinely belong in metal. Primary structural members in crash-load paths, components requiring electrical grounding or thermal conductivity, and very-low-volume specialty parts with insufficient tooling payback are legitimate exceptions. When RL Hudson's engineering team identifies that a proposed conversion is not a good fit, we typically begin by asking a series of clarifying questions to make sure we have the full picture. If the assessment holds after that conversation, we provide a written or verbal response that explains specifically why we believe the conversion is not viable at that time. The goal is to leave room for information that has not yet been shared and that could change the outcome, rather than simply closing the door. A clear early decision protects program timelines and avoids costly mid-project reversals.

INSERT MOLDING: THE HYBRID PATH

Some components need plastic for most of their geometry but have a genuine metal requirement: threaded inserts for high-torque fastening, EMI shielding, or press-fit bearings. Insert molding addresses this directly. Metal inserts are placed in the mold before injection; plastic flows around and encapsulates them in a single operation. RL Hudson has applied insert molding across multiple OEM programs where this approach resolved design requirements that full conversion alone could not.

SECTION 03

RESIN SELECTION: A PERFORMANCE FRAMEWORK

Resin selection is the most consequential engineering decision in a metal-to-plastic conversion program. The wrong resin, chosen on cost alone, produces field failures. The right resin, chosen against the application's actual performance requirements, routinely outperforms the metal it replaced. With hundreds of engineered polymer formulations available, selection must be systematic and application-driven, not guided by familiarity or procurement convenience.

RESIN SYSTEM	TENSILE STR.	CONT. SVC. TEMP	CHEM. RESIST.	SHRINK RATE	PRIMARY ADVANTAGE	METALS TYPICALLY REPLACED
PA66-GF30/50 Glass-filled nylon	160–210 MPa	130–160°C	Good	0.4–0.8%	Broadest strength-to-weight ratio; most widely used metal replacement resin	Aluminum die casting, steel stamped brackets, zinc housings
PPS Polyphenylene sulfide	175–200 MPa	200–220°C	Excellent	0.15–0.5 %	Underhood thermal and chemical resistance; near-zero moisture absorption	Zinc die cast, stainless steel, magnesium alloy housings
PPA Polyphthalamide	180–220 MPa	180–210°C	Very good	0.3–0.6%	High-heat nylon alternative; superior to PA66 above 150°C	Aluminum underhood components, zinc die cast thermal parts
PC/ABS Polycarbonate blend	50–60 MPa	100–115°C	Moderate	0.4–0.7%	High impact resistance; excellent surface quality; colorability without painting	Sheet metal stampings, cast housings where surface finish matters
PP-GF Glass-filled polypropylene	60–100 MPa	110–130°C	Very good	0.3–0.7%	Low density; excellent chemical resistance; cost-effective for large structural components	Steel fluid reservoirs, light structural stampings, access covers

Temperature ratings reflect published continuous service values from major supplier datasheets (BASF, Solvay, DuPont, Celanese). Values vary by grade, load, and media exposure. Always validate against the specific resin datasheet for your application.

Resin selection drives everything downstream: part geometry, wall thickness, gate strategy, tooling deign, and field performance. Get it right early or pay to fix it later.

FIBER REINFORCEMENT AND ANISOTROPY

Glass and carbon fiber reinforcement substantially increases tensile and flexural strength but introduces directional variation in mechanical properties based on fiber orientation during fill. Fibers align with flow direction; cross-flow strength is noticeably lower. Gate location, runner layout, and fill strategy must be engineered to orient fibers along the primary load direction. Mold flow simulation with fiber orientation output is required for structural fiber-reinforced applications, not optional.

SECTION 04

STRUCTURAL REDESIGN: YOU CANNOT COPY METAL IN PLASTIC

The most common cause of conversion failure is treating the exercise as a direct material swap. A steel bracket 6mm thick cannot be reproduced in nylon at 6mm and expected to perform equivalently. Plastic components must be engineered for polymer mechanics, not adapted from metal geometry. Shrinkage, fiber anisotropy, creep, and moisture absorption behave very differently from metal fatigue and yield, and each must be accounted for at the design stage.

WALL THICKNESS AND RIB DESIGN

Injection-molded walls typically range from 1.5 to 4.0mm depending on resin flowability and structural requirement. Uniform wall thickness minimizes warpage and sink. Where stiffness is needed, ribs are more efficient than thick walls. Standard practice: rib thickness at 50 to 60 percent of nominal wall, height no more than three times the wall, spacing at two to three times wall thickness intervals, with a minimum base radius of 0.5mm to reduce stress concentration at the root.

DRAFT ANGLES AND MOLD RELEASE

All vertical surfaces need draft, typically 1 to 3 degrees, for clean mold release without dragging or surface damage. Draft must be designed in from the start of the geometry. Textured surfaces require 3 to 5 degrees depending on texture depth.

WELD LINES, GATE STRATEGY, AND FILL ANALYSIS

Gate location determines where flow fronts meet inside the mold cavity, forming weld lines. In unfilled or lightly filled resins, weld line strength typically runs 70 to 90 percent of bulk tensile strength. In fiber-reinforced materials, which represent most RL Hudson conversion programs, the reduction is far greater: glass fibers align parallel to the weld line during fill rather than bridging it, so heavily glass-filled grades can fall to 30 to 60 percent of bulk strength depending on fiber content, resin, and process conditions. Gate placement is therefore a structural design decision, not just a processing variable. Simulating fiber orientation before tooling is cut is far cheaper than repositioning gates after a first article reveals a load-path problem.

CREEP AND THERMAL EXPANSION

Unlike metal, plastics exhibit creep, a slow dimensional change under sustained load over time. Fastener preload, press-fit retention, and joint geometry must be designed to maintain function over the full service life, not just at initial assembly. The coefficient of linear thermal expansion in plastics is typically three to eight times higher than steel. Differential expansion at metal-to-plastic joints must be managed through clearance design, floating fastener holes, or flexible joint geometry.

COMPRESSION LIMITERS

At fastened joints, a compression limiter is the standard solution to creep. Without one, a fastener torqued into a plastic boss relaxes over time as the material creeps under load, reducing clamp force and risking joint looseness or leakage. A compression limiter, typically a short stainless steel or aluminum sleeve insert-molded or pressed into the boss, lets the fastener clamp against metal instead of plastic while the surrounding plastic provides alignment and load distribution. See Section 06 for an applied example combining compression limiters with conductive inserts for galvanic protection.

REDESIGN CHECKLIST

- ▶ Wall uniformity: Remove thick sections; transition gradually (max 3:1 ratio) to prevent sink marks and internal voids.
- ▶ Rib sizing: Height no more than 3x wall; thickness 50 to 60 percent of wall; base radius at least 0.5mm.
- ▶ Draft angles: 1 degree minimum on all vertical surfaces; 3 to 5 degrees for textured surfaces.
- ▶ Weld line placement: In fiber-reinforced parts, weld line strength can drop to 30 to 60 percent of bulk strength. Simulate fill, validate fiber orientation, and gate away from load-bearing zones before cutting steel.
- ▶ Insert molding: Where metal threads or bearing surfaces are needed, overmold stainless inserts directly in one operation.
- ▶ CLTE management: Plastic expands 3 to 8 times more than steel. Account for this in joint design and floating fastener geometry.
- ▶ Creep allowance: Design fastener preload and joint geometry to maintain function across the full service life.
- ▶ Sink mark control: Bosses and ribs must follow the 60 percent rule or sink marks appear on the opposite show surface.
- ▶ Shrinkage compensation: Resin shrink rates range from 0.1 to 2.5 percent. Build the correct value into tool dimensions before cutting steel.
- ▶ Compression limiters: At fastened joints, insert-mold or press-fit metal sleeves into bosses so fasteners clamp against metal, not plastic. Prevents creep relaxation and joint looseness over the service life.

SECTION 05

TOTAL COST OF OWNERSHIP: BUILDING THE FULL BUSINESS CASE

Comparing unit price between a metal component and its plastic equivalent produces a misleading picture. The correct metric is total cost of ownership: raw material, secondary operations, assembly labor, surface finishing, warranty exposure, and tooling lifecycle cost combined. Conversion programs that look marginal on a per-part basis often deliver 25 to 50 percent system cost reductions when the full picture is evaluated.

COST CATEGORY	METAL COMPONENT	PLASTIC CONVERSION
Raw material	Steel and aluminum commodity pricing is subject to significant market fluctuation and tariff exposure. Verify current pricing with your procurement team for program-specific analysis	Commodity resins (PP, PA66, PC/ABS): \$1 to \$3 per pound. High-performance grades (PPS, PPA): \$4 to \$10+ per pound. Mass per part is 80 to 90 percent lower than steel, which offsets the higher per-pound resin cost at the system level for most programs
Secondary operations	Machining, deburring, and grinding can represent a large share of total part cost in complex stamped or cast assemblies	Molded net-shape. Secondary operations are typically eliminated; trimming only where flash occurs
Surface finishing	Painting, plating, or powder coat adds meaningful per-part cost and introduces yield loss at the coating stage	Color and surface texture compounded into the resin. No separate coating operation, no coating-related scrap
Assembly labor	Multi-piece metal assembly adds direct labor to every unit and creates opportunities for assembly error	Part consolidation reduces assembly to a single-part installation. Snap features remove fasteners and torque operations
Corrosion and warranty	Coating degradation, rust initiation, and oxidation-driven failures accumulate over service life; warranty reserve is required	Plastics do not corrode. No coating to degrade, no oxidation mechanism. Lower warranty reserve is defensible
Tooling investment	Progressive stamping dies: \$80K to \$300K+. Die-cast tools: \$40K to \$200K+. Shorter tool life and higher maintenance cost per cycle	Injection molds: \$30K to \$300K+ depending on complexity, cavitation, and feature requirements. Tooling lasts significantly longer than stamping or die-cast tooling at comparable volumes
Supply chain	Multi-step supply chain across casting, machining, coating, and assembly with multiple suppliers and multiple lead times	Single integrated supplier from resin to finished assembly. One purchase order, one lead time, one quality relationship

At volume, a well-executed conversion does not just reduce part cost. It restructures the entire cost architecture of the component program.

BUILDING THE BUSINESS CASE

RL Hudson's engineering engagement begins before the purchase order. Our engineering group works directly with OEM design teams from the first conversation about conversion potential, evaluating feasibility, recommending resin options, reviewing part geometry for moldability, and helping build the financial case that supports the internal conversion decision. You know your products and application requirements; we know rubber and plastic components and how to manufacture them. **Let the RL Hudson team be an extension of your own design team.**

For engineering teams evaluating conversion for the first time, RL Hudson offers on-site Lunch and Learn sessions covering metal-to-plastic conversion fundamentals, material selection, design for manufacturability, and total cost of ownership analysis. Sessions are practical and application-specific, working through examples from your product line.

SECTION 06

CASE EVIDENCE: RL HUDSON CONVERSION PROGRAMS

The programs below represent metal-to-plastic conversion outcomes from RL Hudson customer engagements across heavy truck, powertrain, thermal management, and marine applications. Each was carried through feasibility evaluation, design review, tooling, and production validation.

APPLICATION	ORIGINAL METAL DESIGN	RESIN	REDESIGN ACTION	OUTCOME
EGR Cooler Stub Connector Pipe Heavy-duty powertrain OEM	Carbon steel stub pipe at \$4.10/unit. D-ring o-ring damaged during installation, causing coolant leaks at assembly. \$15,958/month in combined warranty and repair costs across two production plants	PA66-GF30 Glass-filled nylon	Flare OD increased from 46mm to 49mm to protect D-ring during assembly. Composite construction validated by FEA: max displacement 0.003mm at 30 psi; Von Mises stress 1.48 MPa (2% of failure stress). DFMEA, thermal shock, and sawtooth fatigue testing completed	Part cost from \$4.10 to \$0.67 (84% reduction). \$68,600 annual savings. Coolant leak quality issue eliminated. D-ring damage resolved. Assembly ease confirmed by production operators at both plants
Throttle Coupling Medium and heavy duty truck OEM	Six-piece metal connection between charge air cooler and throttle body. Multiple metal interfaces created tolerance stack-up and assembly complexity. Operated to 100 psi peak intermittent boost and 240°F ambient	PA66 glass-fiber nylon with overmolded rubber seal	Redesigned as a single injection-molded plastic component with overmolded rubber. Six-part metal assembly replaced in one molded component. All assembly steps and metal-to-metal tolerance interfaces eliminated	Six metal parts consolidated to one molded component. Significant cost reduction achieved. Assembly complexity eliminated. No secondary operations required. Operating spec fully met including boost pressure and thermal requirements
Hydraulic Access Port Cover Heavy equipment OEM	Multi-component metal cover assembly with separately attached fittings. High fastener count increased assembly cost and time. Customer sought manufacturability guidance	Engineering thermoplastic	Multiple fittings incorporated into one molded component in orientations optimized for customer assembly. FEA used to reduce fastener count. Full DFM advisory provided to customer engineering team throughout program	Cost and weight reduction achieved. Per RL Hudson engineering team: 8 metal parts to 1 molded component; approx. \$50 savings per assembly.
Heater Hose Manifold Automotive / truck coolant system	12-component metal manifold assembly. High assembly difficulty and part count. Multiple metal-to-metal joints required for coolant routing and structural integrity	Engineering thermoplastic with retained metal components	Metal-to-plastic conversion reduced assembly from 12 components to 3. Coolant flow paths and structural rigidity maintained in redesigned geometry. Assembly process greatly simplified	Assembly reduced from 12 to 3 components. Greatly reduced assembly difficulty and overall cost. Coolant flow and structural rigidity maintained throughout production and service
Marine Heat Exchanger End Cap Marine application	Metal end cap assembly requiring separate components for corrosion protection. Galvanic protection of aluminum heat exchanger required additional measures. Fastened joint presented creep risk in marine environment	Engineering thermoplastic with stainless metal inserts and compression limiters	Insert molding incorporated metal inserts and compression limiters directly into molded end cap. Conductive path established between inserts for anodic protection of aluminum heat exchanger body. Compression limiters prevent creep relaxation at fastened joints in service	Cost and weight reduction achieved. Anodic protection of aluminum heat exchanger incorporated without separate components. Compression limiter design eliminates fastener creep relaxation over product service life

Each of these programs shared a common starting point: RL Hudson's engineering team was engaged before the design was finalized. Resin selection was driven by the application's most demanding performance requirement, not unit cost. And the component geometry was purpose-built for injection molding, not adapted from the metal design. Those three conditions are repeatable. They are the foundation of every RL Hudson conversion engagement.

SECTION 07

IMPLEMENTATION ROADMAP: FEASIBILITY TO FIRST ARTICLE

A metal-to-plastic conversion is a program, not a purchase order. In product development generally, decisions made early in the design process carry the most downstream consequence, and conversion programs are no exception.

01 Feasibility and Load Environment Definition

Define thermal range, chemical exposure, mechanical load paths, regulatory requirements, and annual production volume. Screen resin candidates against all five feasibility dimensions. Produce a go/no-go recommendation with supporting rationale before any design investment is committed.

02 Collaborative Design Review at Concept Stage, Not at RFQ

Bring RL Hudson's engineering team in before CAD is finalized. Review wall thickness, draft requirements, gate strategy, rib design, part consolidation opportunities, and insert requirements together. Design changes at this stage cost nothing. The same changes after tooling is cut cost thousands of dollars and weeks of program delay.

03 Mold Flow Simulation and Finite Element Analysis

Run resin-specific mold flow simulation to validate fill pattern, weld line locations, fiber orientation, warpage risk, and cooling channel design. Adjust gate location before steel is committed. Run FEA in parallel to validate structural performance under service loads.

04 Tool Build and Process Development

RL Hudson's tooling team, including Rapid Production Tooling in Colorado, builds production-intent tooling with scientific injection molding process development embedded from the first shot. Fill, pack, hold, and cooling parameters are optimized systematically using a data-driven decoupled molding approach. Process capability is documented before samples go to the customer.

05 Design Verification, Bench Testing, and PPAP

RL Hudson works with the customer to develop a Design Verification Plan and Report (DVP&R) for the converted component, then performs the bench testing directly, including pressure, thermal cycling, chemical resistance, and application-specific functional tests, leaving the customer responsible only for on-engine or in-vehicle validation. This absorbs a significant share of the customer's validation burden, accelerates their timeline, and gives RL Hudson direct performance data before production. Full PPAP dimensional layout, material certification, and AIAG functional validation follow, with safe-launch protocol on the first three production lots. Nothing ships without a signed Part Submission Warrant.

06 Continuous Improvement After Launch

After production launch, RL Hudson's quality team monitors process capability (Cpk), scorecard metrics, and field performance data. Programs often surface additional cost reduction opportunities in Year 2 through cycle time optimization, multi-cavity tooling expansion, or assembly integration improvements.

LET'S FIND THE VALUE IN YOUR NEXT COMPONENT

How many metal components in your current product line were specified before engineered plastics could do the job? Some of them are carrying costs in weight, assembly labor, corrosion warranty, and production lead time that a conversion program would eliminate. Identifying which ones qualify, and building the financial case for the ones that do, is exactly what RL Hudson's engineering team does.

RL Hudson's engineering team helps you identify those opportunities, build the financial case, and execute the conversion from design through first article. Let the RL Hudson team be an extension of your own design team. We also offer on-site Lunch and Learn sessions for engineering teams evaluating conversion for the first time.

(918) 259-6600 • info@rlhudson.com • www.rlhudson.com

ISO 9001

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A Note on Data and Sources: Resin performance specifications reflect published continuous service temperature ratings and mechanical property ranges from major supplier datasheets including BASF, Solvay, DuPont, and Celanese. Actual values vary by specific grade, load, and media exposure; always validate against the resin datasheet for your application. Industry cost savings figures of 25 to 50 percent are drawn from multiple independently published OEM program reports and represent reported ranges, not guaranteed outcomes. Tooling cost ranges are representative of commonly quoted single-cavity production tooling and vary significantly by part complexity, cavitation, hot runner requirements, and supplier. All case study outcomes in Section 06 reflect verified RL Hudson program data.