THE WHITFORD GROUP OF COMPANIES

A slightly different approach to the business
Whitford manufactures the largest, most complete line of fluoropolymer coatings in the world. We have manufacturing sites in major markets of the world, offices in more, and work with long-standing agents in many other markets.

But size is not what distinguishes Whitford from its competitors.
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IN THE BEGINNING

Whitford is a worldwide organization operating in every major market in the world whose products are selling in more than 100 countries. We make the largest, most complete line of fluoropolymer coatings in the world — along with many other related products.

It wasn’t always that way.

Out of the ashes

Whitford Corporation was founded in 1969.

Two friends, former classmates, had been working at the same company for several years. Suddenly, three days before Christmas, both were fired.

They went to lunch. It was a long one. By the time they finished coffee they had decided to start their own business. They had no clients; no products to sell; all they had was a dream.

Today, that dream has become Whitford Worldwide.

It’s an unusual company. This, briefly, is its story.

Tomorrow, the world

Soon after the two founders of Whitford Corporation opened for business, they hired a third friend (and former classmate), equally entrepreneurial in bent. After completing a project in the United States, he returned to his native England. Six months later, he opened Whitford Plastics Ltd. in Cheshire.

From its very beginning, Whitford has taken a global approach to its business — a point of view that has been key to what success the company has enjoyed.

Where it all began: Whitford’s first home in West Chester, Pennsylvania.
Our first home, in the United States, was a small cinder-block building on the wrong side of the tracks in West Chester, Pennsylvania. Inside were two bare tables, one telephone, a two-horsepower mixer and 5,000 square feet filled with little but hope.

England got off to a similarly auspicious start: Whitford’s first office was the living room of the founder.

**Our first product:** still going strong

March of 1969 witnessed the creation of Whitford’s first product: Xylan® 1010, a matrix coating based on an alloy of engineered polymers. We sold a grand total of five gallons to Xomox Corporation for use on valve actuators. It was designed specifically to solve two problems:

- Provide a tough, very low-friction film that could withstand the constant wiping of a rubber seal,

- Yet be capable of being cured at temperatures sufficiently low to avoid distorting or blistering the aluminum casting of the actuator housing.

It worked. And Xylan 1010 remains one of our most popular products today.

We had launched the first of a series of products designed to compete with the goliaths of the high-performance-coatings industry.

But Whitford’s first product had been launched with one important difference.
SELLING PRODUCTS OR SOLVING PROBLEMS?

Some companies develop products in the abstract — and then bend problems to fit the products. We at Whitford take the opposite point of view.

To date, the genius of man has not been able to devise anything as good as fluoro-polymer coatings to solve the combined problems of friction, corrosion, wear and lack of release. One reason is that such coatings can be adjusted endlessly to match the precise demands of different problems.

Which brings us to a statement of our philosophy.

We believe that the way to a better product is to start with a specific problem, then create a product specifically designed to solve it. So long as we remember that our business is solving problems, the selling of our products will take care of itself.

Due to their extreme adaptability, (and Whitford’s policy of adjusting formulae to match the problem at hand), these coatings offer a wide variety of benefits. They include: low friction, outstanding release, superior resistance to wear and abrasion, extensive resistance to corrosion and chemicals, a wide operating temperature range, UV stability, thermal stability, pliability, machinability, outstanding adhesion to most substrates, electrically conductive and static dissipative systems, EMI/RFI shielding, no shrinkage or warpage, available in many colors, UL® listings, NSF approvals, FDA, REACH and other worldwide regulatory compliance, etc.

Today, our products are solving problems in many important markets, such as:

*Developed by Whitford for waffle irons, the first low-cure one coat with the release of most two coats brought a smile to the face of an old friend.*
Housewares

Whitford’s Xylan®, Skandia®, Quantum2®, QuanTanium®, Eclipse®, HALO®, Excalibur®, and Eterna™ brands (among others) have established worldwide consumer recognition. These products are found at every level of the market, from opening-price-point to the top end.

They are used on cookware, bakeware, small appliances, personal care items. Applications range from frying pans, cake pans, toaster ovens, grills, irons and griddles to items such as curling wands and straighteners. These coatings are easily applied using a variety of cost-effective techniques and offer price/performance options for various market levels.

Industrial

Whitford’s first product was a matrix coating engineered for the industrial market. These high-performance fluoropolymer coatings are low-friction, dry-lubricant materials that achieve remarkable synergy by combining the capabilities of at least two types of engineering plastics to provide wear-resistant, long-life coated surfaces.

Our industrial products are generally marketed under the Xylan trade name, and serve myriad markets such as:

1. Automotive/flexible substrates: Whitford makes the world’s largest line of fluoropolymer coatings for automotive components. These coatings solve problems of abrasion, corrosion, noise (itch and squeak), friction, release, sealing, weathering and decoration.
Auto manufacturers who have specified Whitford coatings range from Audi through the alphabet to Volkswagen.

Whitford’s line of specialty automotive coatings offers a complete list of benefits to solve the many problems mentioned above on flexible substrates. Some are sold under the Xylan name (solvent-borne) and others under the Resilon® name (waterborne).

There are very few automotive problems that Whitford coatings cannot solve.

2. Oil and gas: Xylan coatings have been the first choice of many engineers in the offshore industry for more than 35 years. You’ll find Xylan hard at work above and below the sea and in the splash zone, wherever severe conditions demand the finest performance from protective coatings.

Many of these Whitford products have also proven extremely beneficial in the chemical processing industry.

3. Reprographics: These coatings offer many benefits for fuser rollers in copiers and laser printers. These include superior toner release, dissipating static electricity, and extending service life dramatically.

4. Molds: Whitford offers a wide range of Xylan, Xylar®, and Dykor® coatings for all types of molds and materials, designed to simplify and make more efficient the manufacture of many different kinds of products.

Typical mold applications include tires, foods, belts, auto headliners, shoes, cutting disks, packaging, etc.

Whitford is world leader in the off-shore oil industry in terms of thin-film coatings.

Whitford coatings help bring better reproduction with longer wear life to copy rollers around the world.
5. **Waterworks**: Whitford coatings offer a long list of advantages, especially compared with stainless steel, whose price has risen significantly. They include resistance to rust/corrosion and galvanic corrosion, plus lower cost, controlled torque, easy removal of nuts, wide range of operating temperatures, UV stability, resistance to hot soil, ease of application, many colors for color coding, and compliance (in many cases) with stringent worldwide regulations on use with potable water.

6. **Industrial bakeware**: Whitford offers a “Cafeteria Plan” of Xylan coatings for industrial bakeware. Customers can pick and choose, designing and combining to suit whatever their needs may be — from liquid or powder primers to powder midcoats to powder or dispersion topcoats.

   These include our fluoropolymer “+” (“Plus”) systems and Xylan XLR liquid systems, both with better, longer-lasting release (along with worldwide regulatory food compliance).

7. **Medical**: The inherent chemical resistance, lubricity, and stability in most sterilization environments make Whitford’s coatings a cost effective solution for many medical applications. Our coatings make guidewires slide more easily, insulate medical device handles against electrical impulses and give them a warmer feel. They eliminate tissue sticking to surgical blades, and provide a smoother feel for cleaner cutting. Some of our coating systems can even facilitate replacement of stainless steel with coated carbon steel, with improved performance at lower cost.

8. **Textiles**: Whitford has adapted its technology to the technical textiles market. Enhancing the performance of fabrics, these advanced coatings offer superior performance in release, low friction, resistance to abrasion, water repellency (increasing both
the degree and longevity), a superior combination of tensile strength and flexibility, outstanding protection against oils and ultra-violet damage, and superior overall performance for all types of textiles.

**Adhesives and sealants**

In 2004, Whitford purchased Polymeric Systems, Inc., a leading manufacturer of adhesives and sealants, and creators of the famous hand-kneadable epoxy repair putty sticks in concentric stick form that do-it-yourselfers use for thousands of repairs.

PSI also developed an impressive line of sealants that includes silicones, butyl- and acrylic-based products, urethanes, polysulfides, oxygen-cure polyurethanes and MS polymer sealants. PSI was the first small manufacturer to produce acetoxy-based RTV silicone sealants.

The bulk of Polymeric Systems’ business falls into two categories: tolling and private labeling for manufacturers. That’s why PSI is known as the “manufacturer’s manufacturer”, committed to working closely with customers to develop, produce and package the products that best suit the customer’s needs.

PSI is managed as a separate entity, but is housed in the same offices, laboratories and factory facility at Whitford’s headquarters in Elverson, Pennsylvania.
THE SECRET WEAPON

By definition, solving new and difficult problems demands an investment in research and development. This, in fact, may be our chief competitive advantage.

Whitford is a privately held company, so we can control our destiny, which includes allocating funds as we see fit.

In fact, Whitford commits one of the highest (and probably the highest) percentages of company sales to R&D in the entire coatings industry, an annual average approaching ten percent, with about 100 people worldwide dedicated to R&D.

We maintain complete R&D centers at each of our manufacturing facilities. The sole responsibility of our skilled chemists (many holding PhDs) and technicians is to solve our customers’ problems, frequently by designing tailor-made products.

We’re committed to staying at the forefront of research and technology. This includes chemical testing and analysis for a wide variety of industries, using a unique combination of analytical capabilities, instrumentation, technical expertise and quality systems.

It includes precise coatings characterization and failure-analysis capabilities that enable researchers to solve a variety of coating problems.

The research and development laboratory at corporate headquarters in Pennsylvania helps keep Whitford’s R&D on the cutting edge. Our available laboratory space is more than ten times larger than at our previous headquarters. In total, Whitford offers fully staffed laboratories in eight of its facilities around the world.
We offer full capabilities including deformation (reverse engineering) and contaminant identification. The Whitford Analytical Laboratory also provides a broad range of services, including problem-solving, failure and chemical analysis, formulation, troubleshooting, consulting, experimental design and analysis, and independent laboratory studies.

In our laboratories you’ll find the more commonplace testing methods as well as an expansive array of research-grade instrumentation not found in most laboratories. Due to the complex nature of coatings and our growing needs, we continuously upgrade laboratory equipment and enhance our services.

Our repertoire includes the scanning electronic microscope, particle-size measurer (to 20 nm), rheometer, TGA-FTIR, Laser Confocal Microscope and a state-of-the-art sound room that is the most advanced in the country as of this writing.

**Quality control: How much is enough?**

Engineered polymers are a chain: the weakest link in the polymeric chains we concoct will determine the strength of the coating.

It would be patently absurd to invest the funds we do in developing coatings without making sure that every single component that goes into them, and the manner in which the components are combined, are as close to flawless as possible.

So our quality control begins with the specification process, testing raw materials to eliminate any potential weak links.
before we begin assembling the chain. We test ingredients and their combinations every step along the way to the finished product, until it’s packed and ready to ship.

There is never enough control in quality control. It takes time, costs money and isn’t perfect. But the closer we come to perfection, the happier our customers are — and the better our business becomes.

**Testing one...**
**Testing two...**

Whitford’s testing program is extensive, running a wide gamut from standard ASTM, BS, DIN, JIS methodologies for acid rain, salt fog, accelerated weathering to some methods unique to Whitford.

We have codified more than 100 different test procedures to determine as many characteristics as possible, including film thickness, release life, completeness of cure, gloss, opacity, hardness, adhesion (including intercoat adhesion), flexibility, impact/drawability, abrasion, staining, mar resistance, coefficient of friction, contact angle, resistance to chemicals, weather, UV, etc.

Our test procedures are designed to examine different dimensions of coating performance, since each facet of a product that can be examined offers another opportunity to fine-tune the product. Unlike our competitors, we make our test procedures — and even the designs of our proprietary test equipment — available to anyone interested. (For a copy of our test procedures, please contact any of our offices.)

In keeping with our expenditures on R&D is the investment we make in state-of-the-art equipment itself, without which it would not be possible to dig as deeply into...
While our investment in testing equipment may appear significant for a company the size of Whitford, it becomes insignificant when compared to the benefits for our customers in terms of better coatings.

And that, in turn, is significant for Whitford.

Our scanning electron microscope can magnify up to 300,000 times. The SEM provides a wealth of useful information on surface topography, composition, electrical conductivity, etc. We use it to check coating uniformity, detect surface defects, identify contaminants. It also permits viewing samples in cross-section to check additive dispersion, surface thickness, adhesion and others. Shown here is a 1,000-power photograph of a plant leaf, part of a study on the "lotus" effect (to create hydrophobic properties in a coating).
Whitford’s sound lab is, as of this writing, the most advanced for NVH control of automotive weatherstripping in the United States. It “floats” on seven feet of fine sand, isolated from the building in which it is housed. It is capable of measuring background noise as low as 10dBA. The inset shows where an electromagnetic energizer stimulates the interface to simulate on-road noise conditions.
Training: Building the Future on the Past

Whitford maintains more active formulae for fluoropolymer coatings than any of our competitors. Working with so many customers in so many countries with so many products for so many years has led to a surprising accumulation of knowledge concentrated within the worldwide organization.

In 1990, we decided to share what we have learned with our customers — and founded “Whitford University”, a lofty name for an intensely practical training program of several days held in many of our offices on an annual basis.

With turnover and growth, our customers are often hiring new people, many of whom are novices in the rather complicated business of handling and applying high-performance coatings. Further, there is generally little formal training available related to the technology.

Our raison d’être

The objectives of Whitford University are three-fold:

• To share our knowledge,

• To help our customers become more highly skilled in the application of fluoropolymer coatings,

• To help familiarize the attendees with the proper handling of the myriad products we manufacture (more enlightened self-interest).

Each program lasts several days and combines classroom lectures with hands-on, practical exercises in the laboratory.

Lectures cover such subjects as product testing, quality-control, surface preparation, environmental regulations, basic “paint math” (calculations of coating coverage) as well as other subjects specific to the particular audience. Laboratory work includes familiarization with all types of application equipment and techniques, color matching, troubleshooting typical problems, demonstrations of testing equipment, etc.

Since the inception of Whitford University, we have graduated several thousand individuals from more than 40 countries.
Training at Whitford University is intense at both the theoretical and practical levels. Each graduate is awarded a diploma.
MICROCOSMICS AT WORK

Whitford products sell in more countries than we can count (due to resellers, we don’t know the total number), frequently to customers who are not yet skilled in the application of high-performance coatings. Further, our business is not immune to the rule of Murphy’s Law.

So we are often called by customers with coating problems. They need help, and they need it fast.

In some instances, we will dispatch a technician to the customer’s facility (which, in more than a few cases, is several thousand miles away). In others, we will attempt to replicate the problem in our laboratories, which are set up to be microcosms of the real world in which our customers operate.

First we subject retained samples of the coating in question to a battery of tests, just to make sure the problem is not the product itself. Then, we reproduce the basic conditions of the customer’s plant on our own equipment.

For this purpose, Whitford maintains a variety of processing equipment: metal-treatment lines, etching lines, standard air spray, HVLP, electrostatic spray, powder-coating facilities, roller coating, curtain coating, dip/spin, ovens, etc. This permits us to simulate the entire application project process and pinpoint precisely where the problem is occurring — quickly and efficiently.

Pioneering processes and products

Maintaining such equipment provides us with another opportunity:
the enhanced ability to develop new, better, more efficient and environmentally friendly coatings. Here are three of many examples:

1. **Reinforced coatings**: Over the years, Whitford R&D has been able to extend dramatically the resistance to abrasion and scratching of many of our products, a project that continues as a priority, especially in the industrial area where coatings are subjected to harsh environments and rough treatment.

2. **Extending release life**: Technology patented by Whitford led to the discovery of the holy grail in nonstick coatings: not only superior but also longer-lasting release which, at first, extended the release of Whitford’s product by a factor of as much as 26 times compared to some of the most popular coatings of the day. This led to the launch of the Eterna brand and a variety of successive products based on the same revolutionary technology.

3. **Coatings for the curtain coater**: There is nothing new about curtain coating, a technology used outside the coating industry for years. What Whitford pioneered was the development of specific coatings that not only withstand but also perform consistently and well under the demanding conditions of the curtain coater. With a finish as attractive as that achieved by spray, but a transfer efficiency of close to 99 percent, these coatings have been bringing significant savings to customers.

The ability to duplicate the customer’s process — from substrate treatment through application with actual production equipment to the final cure — accelerates and simplifies the problem-solving process.

It also leads to important performance improvements in coatings that work better and save money for our customers as they reduce significantly the contamination of the environment.
A Few Firsts

Our focus on solving problems has led to a series of “firsts” within the industry. Here are a few examples:

• First fluoropolymer dry-film lubricant to operate consistently at 260°C/500°F and above (Xylan 1010, our very first product).
• First thin-film lubricant to withstand pressures of 150,000 psi (Xylan 1052).
• First corrosion-resistant dry-film lubricant (Xylan 1070).
• First bright white fluoropolymer coating (Xylan 1514).
• First bulk coating material to deliver consistently 400 hours of resistance to salt spray, later improved to more than 1,000 hours (Xylan 5251).
• First one-coat that cures at lower temperatures and offers the release of most two-coats (Xylan 8460).
• First high-temperature-resistant wood-grain finish (Xylan 8885).
• First coatings designed for use on the curtain coater for economical application of non-sticks to cookware (Xylan 7900 series).
• First fluoropolymer system to adhere to pyroceram (Xylan 8231/8232).
• First internally reinforced basecoat dedicated entirely to adhesion to the substrate to provide greater durability for cookware coat-
• First thin (0.0002 inches) metallic coating to be bulk-applied and survive more than 1,000 hours in salt spray (Xylar).

• First internally reinforced nonstick coating to provide increased durability for coil-coated bakeware (Quantum for coil).

• First externally reinforced coating system to provide significantly greater durability, justifying nonsticks on top-end cookware (Excalibur).

• First waterborne VOC-compliant coating for use on rubber substrates for glass-run and freeze-release applications (Xylan 1238/1239).

• First to use titanium as a special internal reinforcing system (QuanTanium).

• First internally reinforced nonstick to achieve over 1 million cycles of abrasion testing (Eclipse).

• First to discover technology that led to extending the release life of nonsticks by as much as 26 times over popular coatings of the day (Eterna).

• First coatings for severe-duty cordage (mooring ropes) that impart improved durability and service life to ropes by reducing damage incurred by both external and internal abrasion (fiber-to-fiber abrasion) (Eternitex® 66-001).

• First powder coating with improved release compared to PFA powder that not only improves release but adds significantly to the life of the release itself (the PFA+ Series).

Unless we lose our way, there will be many more “firsts” in the future.
THE GREENING OF WHITFORD

When we published our corporate brochure in 1996 (well before “green” became a fad and then morphed into an important movement), we featured a chapter with the same title you see above. Following is what we said, exactly as we said it then.

Historically, high-performance coatings such as those we manufacture have been made with solvents, which have been a crucial ingredient in achieving the performance of such coatings.

But solvents are ‘volatile organic compounds’, and ‘VOCs’ contaminate the atmosphere.

Many years ago, recognizing the damage to the environment caused by pollutants, and acutely aware of what we were contributing to the damage, we began to look for safer alternatives to our solvent-borne products (one of the reasons we spend so high a percentage of our sales on R&D). This search gave us the jump on the industry.

Today, we make environmentally acceptable analogues for most of our product lines, with hundreds of ‘green’ formulae available to our customers. The VOCs of these coatings are less than (and, in some cases, significantly less than) the limits permitted by the toughest environmental legislation found in any of the markets in which we sell.

With five manufacturing facilities around the world, it is our policy to apply the most stringent environmental regulations to all of our locations, no matter how less demanding the local laws may be.

More enlightened self-interest

Our decision to develop coatings with low VOCs may have been based on a concern for the environment, but it was also
based on what we believed to be sound business judgment.

It was obvious that regulations governing the emissions in most areas in which our customers conduct their businesses were going to get stricter. They have, and they will continue to be tightened. Being a leader in ‘green’ options gave Whitford a head start.

We continue to develop low-VOC options, and look forward to the day when our entire product line is ‘green’.

Doing what’s right is good for the environment. But it’s also good business, since it helps our customers — and that, in turn, helps us.

**Plus ça change...**

Many years have passed since we codified our view on the environment, and we see no reason to alter anything we wrote. It remains our policy to comply with the strictest environmental regulations in all the countries in which we do business, as well as to maintain our on-going search for new and better ways to minimize pollutants as we improve our products and create new ones.

We maintain fully staffed departments of regulatory affairs in the offices in which we manufacture. As the worldwide head of this department recently reported, “Our record of environmental compliance is flawless”.

We intend to keep it that way.
WORDS WE LIVE BY

Successful organizations tend to have several things in common: clear direction, the will to excel, a sense of urgency and a distinctive personality.

Collectively, these are frequently referred to as “corporate culture”.

Many years ago, soon after Whitford was founded, we wrote down our thoughts about the kind of company we wanted to be, the principles that should guide us, the kind of environment we wanted to create for our people. We boiled these down to six simple statements and printed them. Called “The Whitford Ethos”, these are displayed in all our offices around the world. This is what it says:

THE WHITFORD ETHOS

1. **We believe in making superior products.** Our products must be better than those of the competition in some way: properties, price, or both. This makes it easier for the customer to choose Whitford — and harder for him to choose a competitor.

2. **We believe in serving our customers better.** While we sell products, we are in the business of people: people whose jobs may depend on the support they receive from their suppliers. In times of diminishing product differences, service can set us apart. We must place our customers’ interests above our own. It is difficult to fire someone who serves you well.

3. **We believe in leading the way.** We must commit a higher percentage of our sales, interest and talent to research and development than our competitors do. We must blaze new trails.

4. **We believe in high personal ethics.** No lying, cheating or stealing. We despise politics, the pastime of small people. We embrace equal opportunity: Everyone must have the same right to succeed.

5. **We believe in being happy.** We spend a lot of time at our jobs. It should be happy time. Life is short. We agree with the Scottish proverb: “Be happy w’er leevin, for y’er a lang time deid”.

6. **We believe in divine discontent.** Self-satisfaction is the first step toward failure. Remember: “Good enough is not good enough”.

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The past is generally a signpost to the future.

We intend to continue to be the company that manufactures the largest, most complete line of fluoropolymer coatings in the world. We continue to believe that problems are only solutions in hiding — and we enjoy the seeking.

It’s possible you may have a problem that one of our many coatings could solve. If so, we’d like to hear from you.

Please tell us about the problem in sufficient detail so we can determine whether we have a product that could solve it.

If we don’t, we’ll make one.
WHITFORD’S
MISSION STATEMENT

We combine superior service with innovative solutions to our customers’ problems via our products and related technology.

Contact Whitford at whitfordww.com
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