

# The Westland Corporation

# PROCESSOR

## Disastrous Wear

Dave Larson, President of Westland Corporation

The website Active.com published an article by a professional of the American Running Association that stated: "To say running shoes wear out between 300 to 500 miles is like saying all car tires wear out between 10,000 and 30,000 miles without taking into consideration car make and model, driving conditions, driver and other factors. Changing your tires too early will waste money unnecessarily, but waiting too long could result in disaster. The same can be said when evaluating the life of a shoe."



Dave Larson

The same can also be said for evaluating the life of a screw and barrel.

There are many factors that need to be taken into account when considering wear on components. The first factor is starting out with the right components.

When purchasing a screw and/or barrel, one needs to consider:

Are they designed for my particular application?

Are they manufactured from the correct material?

Processing with a poorly designed screw and/or barrel can have a major effect on your results.

Processing with a worn screw and/or barrel can be disastrous to your bottom line.

The article inside this newsletter defines (with pictures) examples of adhesive wear, abrasive wear and corrosive wear. Also included is a table indicating common causes of each.

Can you or your maintenance department distinguish between expected normal wear versus premature wear? Was the machine aligned properly? Were the correct start-up and shut-down procedures followed? Was there excessive residence time?

The key point to remember is that all of the causes of excessive wear can

be prevented. It takes the right screw and barrel plus a knowledgeable maintenance and processing department.

If you are experiencing premature or excessive wear on your components, we can help.

**All of the causes of excessive wear can be prevented.**

Westland has a strong reputation for being more than a screw and barrel supplier. Our goal is to work with our customers, not only in their barrel and screw needs, but also in understanding their processing requirements. This experience, combined with a quality product and timely service, we believe, offers the best value for your dollar.

Call us today. We want to prove this is more than just a sales pitch.

## WEARING YOUR MONEY OUT!

Our present sized currency measures 2.61 inches wide by 6.14 inches long, and the thickness is .0043 inches. Currency paper is composed of 25% linen and 75% cotton.

Have you ever wondered how many times you could fold a piece of currency before it would tear? About 4,000 double folds (first forward and then backwards) are required before a note will tear.

**Do you know the average life** of a one dollar bill in circulation? Answer inside.

## Westland Corporation

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Dan Johnson, Wayne Hook & Dave Larson

## Wayne Hook Receives 20 Year Award

Wayne Hook, Director of Engineering and Sales, was recently honored for 20 years of exemplary service at Westland Corporation.

Wayne started at Westland as a part time maintenance assistance and has held several different positions over the years.

Currently Wayne oversees all sales activities to ensure a smooth flow from purchase order receipt and print verification to scheduling. Wayne also directs the activities of the Design Engineers whose innovative design capabilities and processing knowledge have enhanced Westland's ability to better serve our customers.

**Westland can rebuild your worn screws and reline your worn barrels ... for a**



**SMOOTH RIDE WHEN THE HEAT IS ON**

## COMPONENT WEAR

### Knowledge of Wear Can Help In Its Prevention

There are three types of wear that occur, often in combination, in barrels, screws, valves and other components. An understanding of the nature and causes of adhesive, abrasive and corrosive wear is essential to the selection and use of these components.

#### Adhesive Wear

Adhesive wear occurs when two metals rub together with sufficient force to cause the removal of material from the less wear resistant surface. If the two metals have a comparable chemical analysis and hardness, a galling action can occur where one metal is actually welded to the other, causing high and low spots where material is added or removed.

The screw and barrel can come into contact with each other during operation. The screw is cantilevered in the barrel and is supported only at its shank and by the plastic in the barrel. When conditions cause excessive contact between the two components, adhesive wear and/or galling will occur on the screw flight outside diameter and the barrel walls.



Example of a Screw with Adhesive Wear

#### Abrasive Wear

Abrasive wear occurs when foreign or abrasive particles in the resin come into contact with the screw or barrel. The scouring effect of the hard particles wears away the metal in the screw or barrel, most often in the transition section of the screw. Foreign particles such as screw flight particles, chrome plating and other objects can also gouge the barrel or screw or even break segments out of the screw flights.

The abrasive particles in the resins can be reinforcements, such as glass fibers or spheres, calcium carbonate and powdered metals or ceramics. All will cause abrasive wear, especially if the components are not made from high quality wear resistant materials.

Abrasive wear can also occur when processing nonreinforced materials if too much of the energy required to melt the resin is generated by shear. Cold pellets moving into the transition section of the screw are compressed and sheared causing a scrubbing action that results in abrasive wear.



Example of a Screw with Abrasive Wear

#### Corrosive Wear

Corrosive wear results from acids and other chemicals that are generated in plastics processing which attack the surfaces of barrels and screws. Corrosive wear is characterized by pitting and usually occurs in the last few flights of the transition zone and in the metering zone. The pits can also collect melt, burn or degrade it, and result in black or burned particles in the parts.

(Continued next page.)

There are several resins that can generate acids at high temperature. They include polyvinyl chloride (which releases hydrochloric acid), acetals (formic acid), fluoroplastics (hydrofluoric acid) and cellulose (acetic, butyric and propionic acids).

In addition, flame retardants, coupling agents and some foaming agents release acids, including bromic and sulphuric acids.



**Example of a Screw with Corrosive Wear**

Despite their acid-generating characteristics, these resins can be successfully processed using the proper screw designs and corrosion-resistant component materials.

**Answer to Do you know ...**

The following information regarding the average life of a Federal Reserve Note was provided by the Federal Reserve System :

- \$ 1 ..... 22 months
- \$ 5 ..... 24 months
- \$ 10 ..... 18 months
- \$ 20 ..... 25 months
- \$ 50 ..... 55 months
- \$100 ..... 60 months

From The Bureau of Engraving and Printing website.

<b>Wear Chart</b>			
Premature, excessive wear of any type is costly to your bottom line. The chart below outlines, with a brief explanation, causes of the three types of wear you may be experiencing on your components.			
	<b>ADHESIVE</b>	<b>ABRASIVE</b>	<b>CORROSIVE</b>
Improper Screw Design CAUSES	X Unmelted Resin Screw Deflection	X Overly Aggressive Screw Design	X Causes Excessive Shear Heat
Improper Component Materials CAUSES	X Must Be Compatible w/ Other Components	X Failure to Use Wear Resistant Materials	X Non Use of Corrosion Resistant Materials
Incorrect Heat Profile CAUSES	X Shear Heat Not Uniform - Screw Deflection	X Heater Band Failure or Settings Too Low	X Excessive Shear from Improper Settings
Poor Manufacturing Workmanship CAUSES	X Inferior Plating, Improper Heat Treatment, etc.		
Improper Machine Allignment CAUSES	X Unmelted Resin Screw Deflection		
Excessive Back Pressure CAUSES		X Compensates for Improper Screw Design	
Failure To Use Magnets CAUSES		X Foreign Particles in the Barrel	
Incorrect Shut Down and/or Start Up CAUSES			X Permitting Soaking of the Resins
Inadequate Moisture Removal CAUSES			X Moisture Allowed To Remain in the Resin
Excessive Residence Time CAUSES			X Over-soaking of the Resin at High Temp



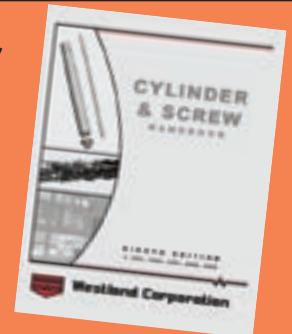
**For more information on screw and barrel wear plus other maintenance issues, contact:**

**Westland Corporation**

**for a free copy of the 8th Edition of our Cylinder & Screw Handbook**

**Call: 800-247-1144 or**

**Email: westland@westlandusa.com**





Winners of the Annual Westland Golf Tournament for 2006 were, from left: Katie Barton (Office Assistant), Loren Tedder (Machinist), Loren Tedder Jr. and Luke Peterson (shipping).



Watching the annual Westland picnic activities are, from left: Charles Girrens (2nd Shift Supervisor), Randy Wise (Sales Manager), Tom Howell (1st Shift Supervisor) and Nancy Howell.



Winner of the 2006 Westland Picnic Grand Prize was Teresa Holst (Human Resource Mgr/Acctg), pictured between Dan Johnson (VP) and Dave Larson (President).

Q: How Long Must You Wait For The World's Premier Bimetallic Barrel?

**A: ONE WEEK**



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