

## Case Study IV



### Continued Water-Cooled Extruder Reliability

**Background.** In 2004 a new Processing Technologies International 6.0" eight zone water-cooled extruder with a 4.0" five zone co-extruder was commissioned to extrude HIPS sheet for a Midwest food packaging manufacturing plant. **Extrusion Performance Fluid (EPF)** was used as the start-up coolant in the barrel zone cooling system and continuously over the next ten years of operation. Maintenance of the system typically employed a short list of weekly, monthly and quarterly checks. Periodic extruder coolant samples were submitted for analysis to evaluate system's corrosion and fouling inhibition. One recent analysis is summarized in Table 1.

	ppm
Iron (as Fe)	<0.1
Copper (as Cu)	0.3
Aluminum (as Al)	<0.1
Zinc (as Zn)	0.2
Lead (as Pb)	<0.1
Nickel (as Ni)	<0.1
Chromium (as Cr)	<0.1
Manganese (as Mn)	<0.1
Suspended Solids	<5.0

Table 1. Case Study IV Coolant Analysis after Ten Years Utilizing an **EPF Coolant**.

**Results.** In contrast to many water-cooled extruders, the extrusion system documented in this case study has not had a single water-related maintenance failure in the ten years that it has been in service utilizing **EPF** as the barrel coolant. The analytical data summarized in above supports this observation in that there is virtually a total absence of both soluble metal corrosion products as well as any suspended fouling particulates in the coolant.

**Summary.** The required maintenance for an **EPF Coolant**-treated barrel cooling water system is typically very minimal. The recommendations summarized in Table 2 can be utilized as a 'Maintenance Guide'. Note, too, that if for any reason a barrel coolant does not 'look right', or its origin is suspect, samples should be submitted to the Laboratory for evaluation. It is very important to the success of this program that only an **EPF Coolant** be used in a given extrusion system.

Water-cooled extruder barrel cooling systems maintained with **Extrusion Performance Fluids** and periodically monitored:

- **Require Minimum Maintenance and Supervision**
- **Virtually Eliminates Downtime Production Losses**
- **Extends Extrusion Equipment Component Life**

## Case Study IV



Maintenance Tasks	
<b>Weekly</b>	Check water reservoir <i>EPF</i> levels.
	Verify zone on-off cycling.
<b>Monthly</b>	All weekly checks.
	Visually check coolant condition.
	Check recirculating pump(s) for seal wear and coolant losses.
	Check all line connecting fittings for leaks.
<b>Quarterly</b>	All monthly checks.
	Examine regulatory valves for operational difficulties.
	Submit coolant samples for Laboratory analysis, if necessary.
<b>Annually</b>	All quarterly checks.
	Inspect and clean water reservoir tank(s).
	Submit all coolant samples for Laboratory analysis.
	If advised, perform a routine annual maintenance flush of barrel cooling system.
	Inspect pump seals for leaks.
	Assess reliability, flow and cleanliness of heat exchanger external cooling water.
Inspect barrel cooling side of heat exchanger for scale and/or deposition.	

## Case Study IV



Table 2. Recommended water-cooled extruder maintenance checks

For additional information regarding the cleaning, restoration and maintenance of water-cooled extruder barrel cooling water systems, please contact *Chemagineering Corporation* at [www.chemagineering.com](http://www.chemagineering.com).