# Mold Releases and Process Aid Additives


AXEL

## *Composite Products Training – Fall 2016*

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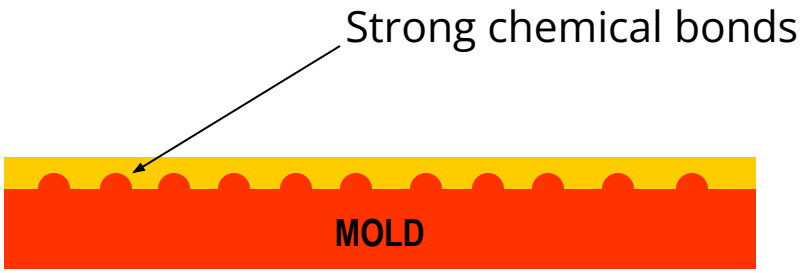
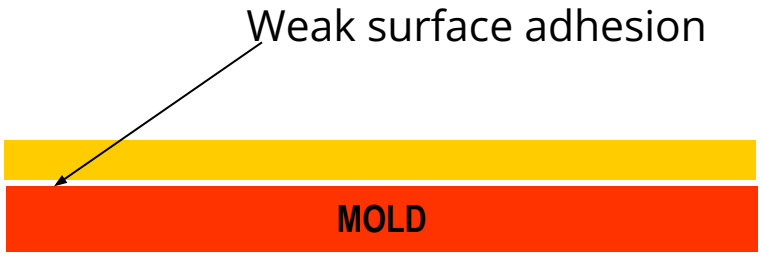
## Semi-Permanent Releases vs. Conventional Mold Release

### Waxes, Polymerics, PVA




**Release film cross-links on exposure to atmosphere or temperature, bonding to mold**

- Reactive resin solutions
- Cross link and cure on the mold
- Forms a chemical barrier
- Thin, strong coatings

**Evaporation deposits a release film on the mold surface**

- Release sits on the mold surface
- Forms a physical barrier
- Fills pores in the mold surface
- Subject to transfer/buildup

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# A Complete Product Line

| PASTE WAX | POLYMER LIQUID | SEMI-PERMANENT |
|---|---|---|
| PASTE WIZ | MoldWiz | XTEND™ Semi-Permanent Mold Releases |

simple

advanced

# PASTE-WIZ

88


- Easy to use to pick up with cloth
- Easy to apply
- Easy to buff off
- Polishes easily
- High Gloss
- Works well in all climates
  - Tested up to 40°C with no problems

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# MoldWiz® Polymeric Mold Release

# F-57/NC


- Liquid release is easier to apply than wax
- MoldWiz® provides some multiple release
- Maintains high gloss on molds when buffed
- Reduces buildup from waxing
- Excellent for plugs and models (wood, etc)

# Filament Winding

Glass fibers or fabrics are run through a resin bath and then wrapped around a spinning mandrill

## Filament Winding
## Press Molding & more

MoldWiz®

# WB-2700
# F23A/NC

- Water-based or solvent based offering
- Releases epoxy, polyester, vinyl ester, phenolic
- Apply by spray or wipe
- Super-slip
- Very easy to use
- Can be diluted

# Filament Winding
# Press Molding & more

MoldWiz®

# WB-2700
# F23A/NC

- No Sealers needed
- No cure time needed – simply allow to dry

# Semi-Permanent System

Most Release Preparation consists of 3 steps:

1. Cleaning
2. Sealing
3. Releasing


Variables are:

- Condition of the surface (plug, new mold, conditioned mold etc.)
- Process conditions (resin, cure times, process temperatures, etc.)
- Requirements for the finished part (gloss, matte, etc.)

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# 1 Cleaning and/or Stripping

## WCX OR CW-10NC
Stripper

- REMOVES SILICONE CONTAMINATION
- REMOVES CONTAMINATION FROM
  - COMPOUNDING & POLISHES
- REMOVES SEMI-PERMANENT RELEASE

Use a cotton cloth and liberally scrub WCX over mold

Wait 10-15 minutes

Wipe off residue of WCX with a clean cotton cloth.

Wash liberally with hot water.

Dry the mold.

Clean with CX-500

And / Or

## CX-500
General Purpose Cleaner

Use two clean cotton cloths.

Use one cloth to wipe on with firm circular motion.

Use one to cloth to wipe off while still wet.

Repeat.

Tape test. Tape should stick.

Water should not bead.

Cleaning is THE MOST important step

# Mold Strippers & Cleaners

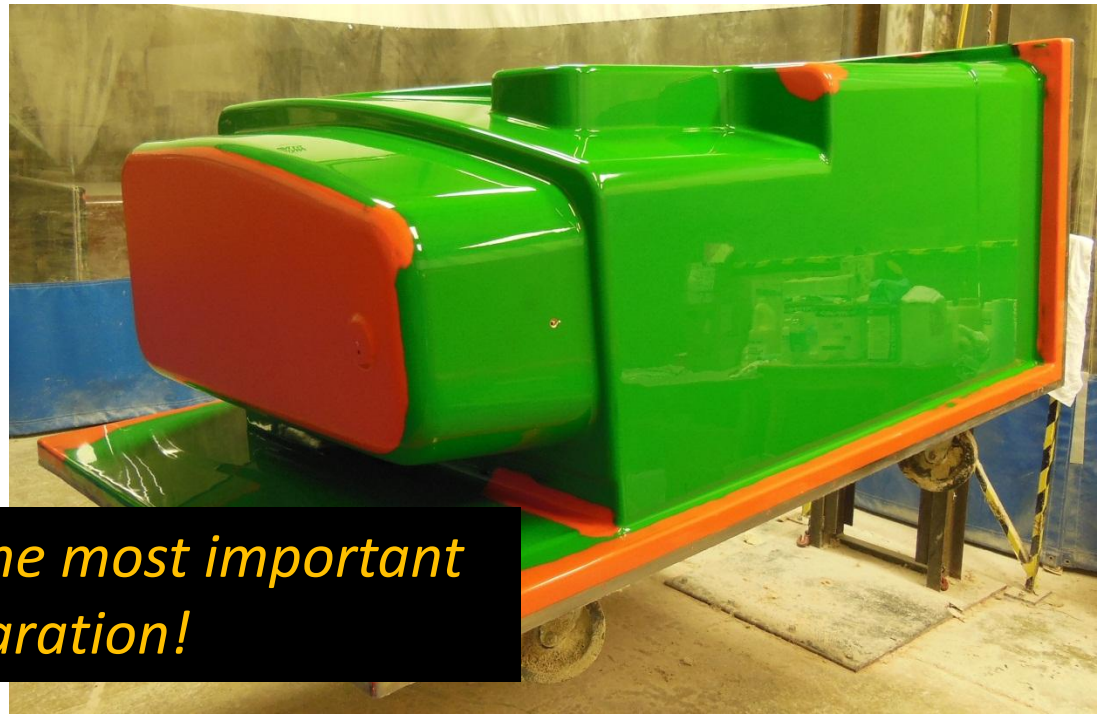
- WHY? Because mold cleaners do not remove most compounds & polishes
  - Removes all compounds and polishes
  - Soaks on the surface
  - Water-based
  - Polishes create most streaking seen on molds
  - Provides more pulls
  - Long term streak free surface

**AXEL WCX Mold Stripper**

# Mold Strippers & Cleaners

- Longest dwell time
  - Allows operator to clean the mold surface before the cleaner evaporates
- More aggressive
  - More effective at removing residue

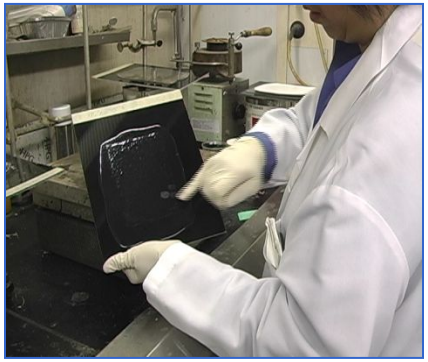
**AXEL CX-500 Mold Cleaner**



*Stripping and Cleaning is the most important steps in mold release preparation!*

# AXEL XTEND AMS Mold Sealer

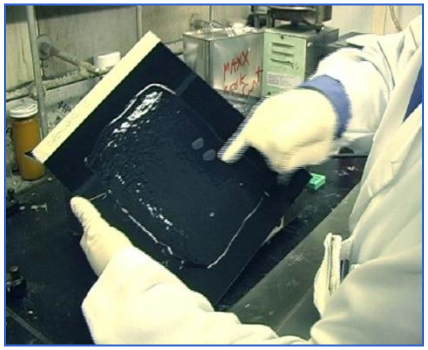
- Highest Gloss Sealer in the marketplace
- Easiest to use
  - Streaks are easily removed
- Compatible with almost all mold surfaces, substrates
- A true sealer

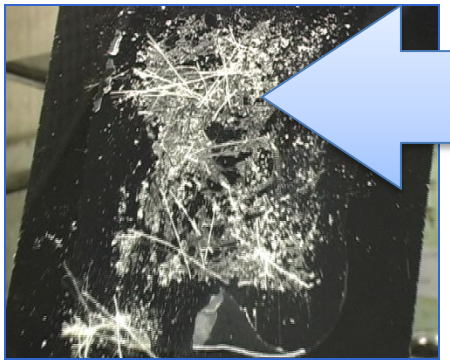


# AMS

**Mold Sealer**

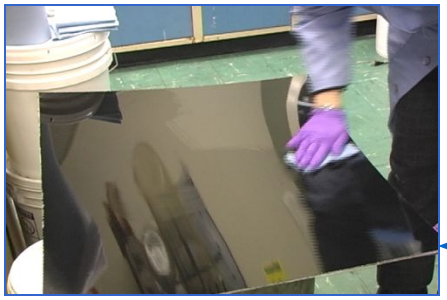
- Cures faster
- Superior chemical resistance
- Easier to apply than competition

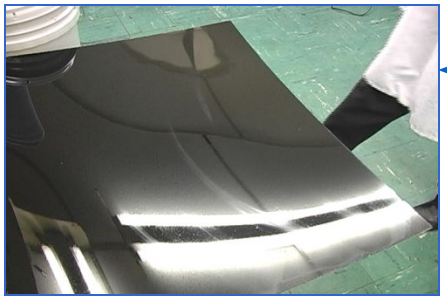




The Competition

# AXEL XTEND AMS Sealer Application





- Work in small areas (0,25-0,5 meters square)
- Wipe-on a wet coat with a **paper** towel or 100% cotton

- Wait approximately 3-15 seconds
  (until it begins to evaporate)

- Polish with a **cotton** cloth by the Wipe, Flip, Wave method.
  - Wipe one time in a circle from the outside to the inside of the wet area.
  - Flip the cotton cloth
  - Now using a wrist motion wave (buff) the mold from the outside in.

# 3 Release for Gel Coated or High Gloss Parts

| | 838 | 818+ |
|---|---|---|
| **Application Temperature** | ambient<br>or higher | ambient |
| **Application Technique** | Wipe-On<br>Wipe-Off<br>  | Wipe-On<br>(NO polishing)<br>  |
| **Concerns** | *NONE* | Mold must be clean<br>Proper application technique |
| **Benefits** | Self cleaning<br>Tolerant of poor application style<br>Easy to polish<br>Highest performance | Fastest application<br>No pre-release; fish eye<br>or orange peel |

# The “Blue Towel” Technique

Fold two towels in quarters

Wet with release

Squeeze

READY


**NOTE : Different brands of semi-perms apply with different methods !**

**DISPOSE OF TOWEL AFTER EACH USE**

# Semi-Permanents

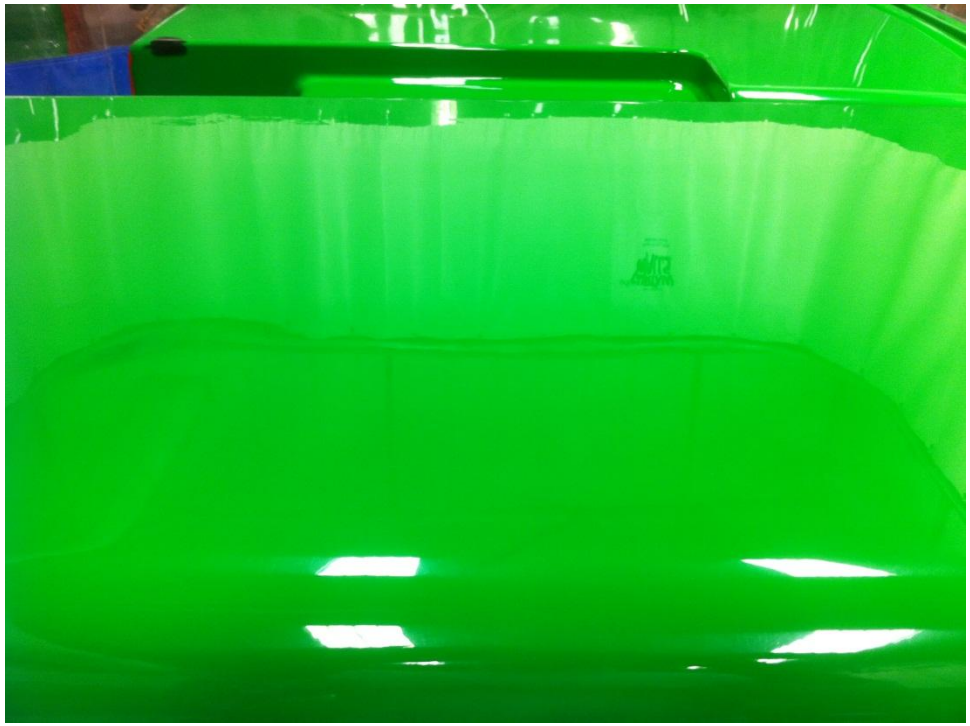
- Best High Gloss Cosmetic product on the market now –**XTEND 838**

  **-XTEND 818+**
- Best High Slip B-side type release on the market – **XTEND 1140HS**
- Mature system including water-based strippers. cleaners – **AXEL's WCX** – and internal release agents

*Tub mold at Kohler BC*

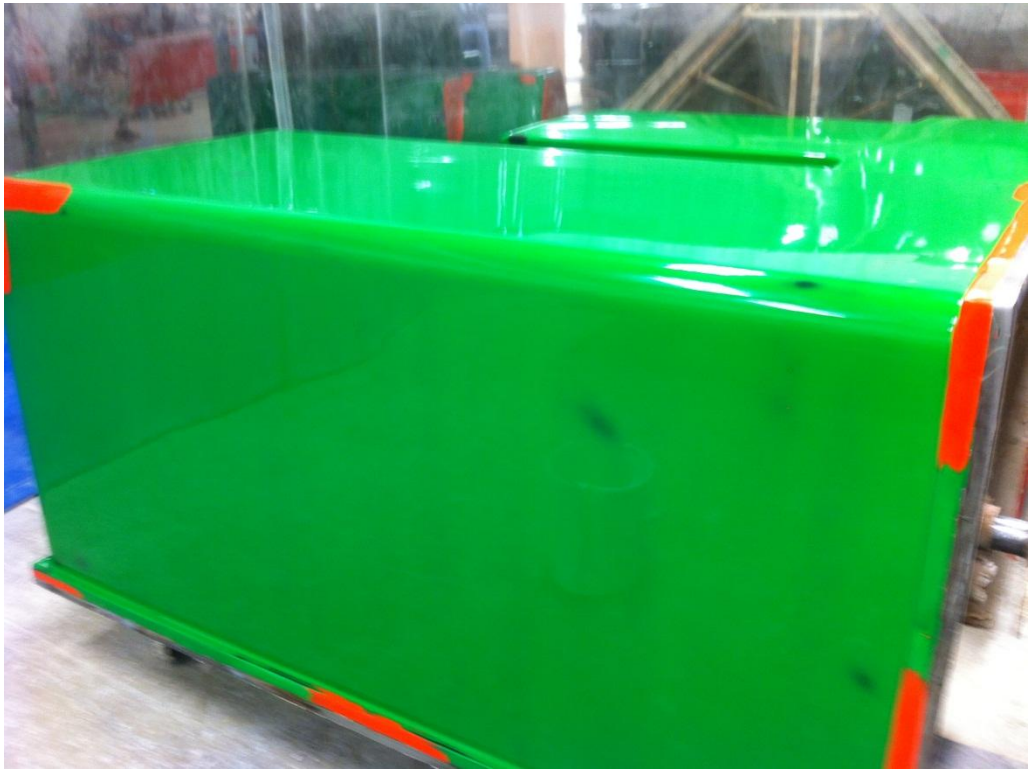
# AXEL XTEND 818+

- Always produces streak/haze free surface
- No buffing necessary
- Excellent for minimizing pre-release
- Quickest application of any semi-permanent
- Highest measured gloss in the industry



# AXEL XTEND 818+

- Mold Touched-up after 1st part.
- Produced 43 parts w/o touch up after 1st part
- Excellent gloss retention (highest available)
- No styrene/monomer haze!



- 1m x 1m shower stall

# AXEL XTEND 818+

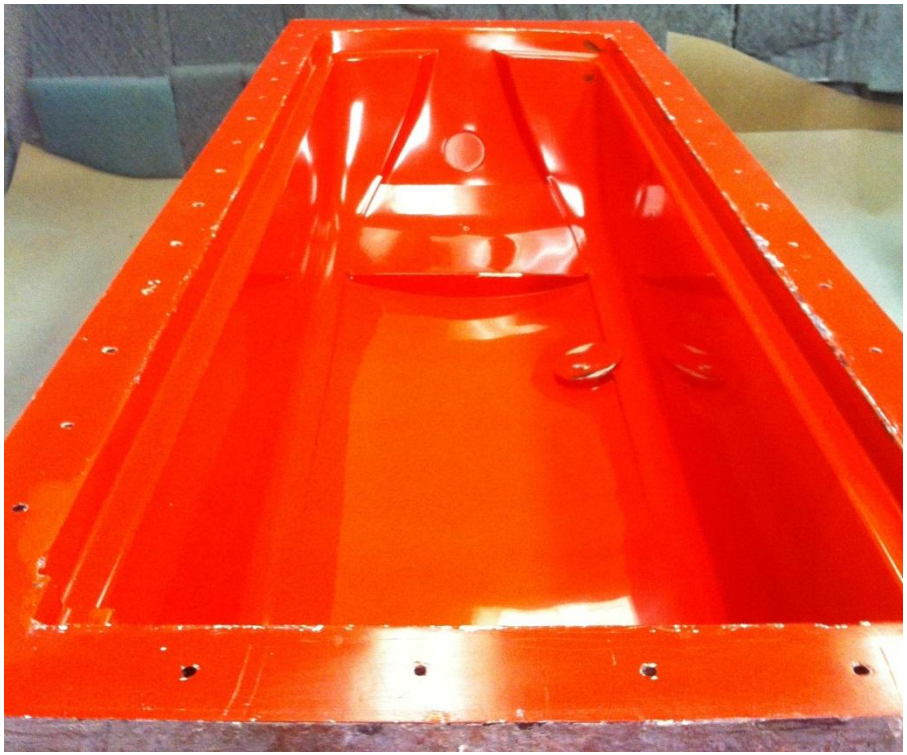
- Excellent ease of release
- Excellent in can stability
- Compatible with other release systems

# AXEL XTEND 19RSS

- Suitable for everything!
  - Urethane, epoxy, polyester, vinyl-ester, gel-coats.
  - Works well at ambient and on heated molds
  - Not cosmetic unless sprayed
    - Tested successfully between **65°F and 310°F**

# AXEL XTEND 1140HS

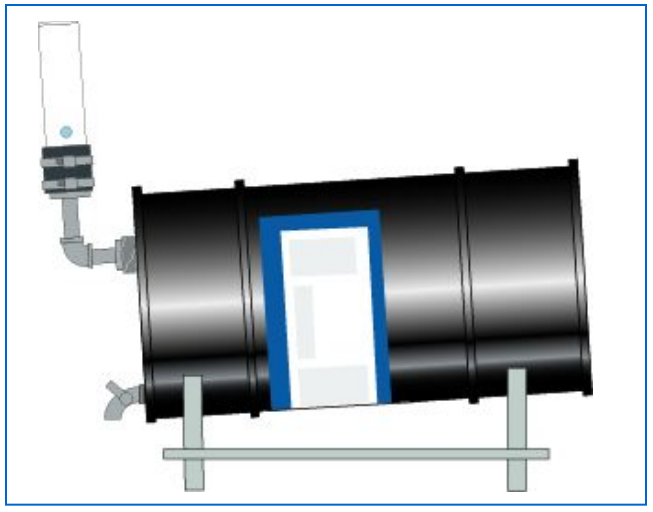
- Excellent for difficult applications – RTM, resin only, etc.
- B Side Offset to Frekote 700-NC, Chemlease R&B,41-90, etc. Zyvax Flex Z 4, 5, & 6



# AXEL XTEND 1140HS

- Excellent cosmetics when needed
- No build-up
- Ease of release is best of all AXEL High Slip B-side type release agents.
- Excellent longevity
- Suitable for gel coats

# Proper Handling and Use
## Solvent-based Semi-Permanent Release



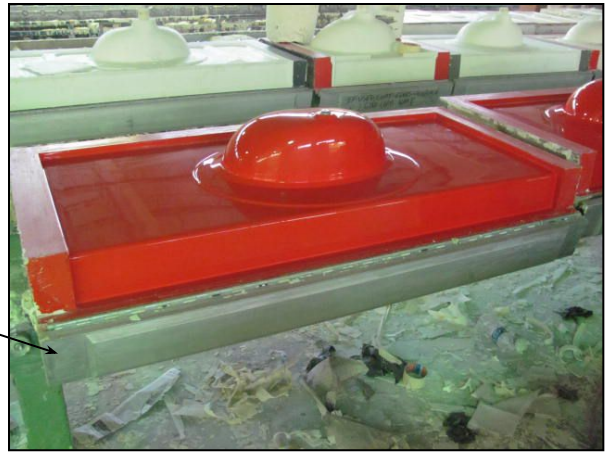
- Sensitive to atmosphere*
  - Keep sealed
  - Never dilute
  - Do not return material to can
  - Purchase smaller unit sizes
  - Rotate stock
  - Use appropriate dispensers
    - clean, do not “top-up”
  - Use appropriate application method
  - Consider desiccant driers

*solvent-based products

# Water-based High Slip

## W-HS

- 100 % water-based
- Nothing sticks to super-slip
- Use on mold flanges
- Use on mold edges
- Use on gates
- Wipe on/Let dry



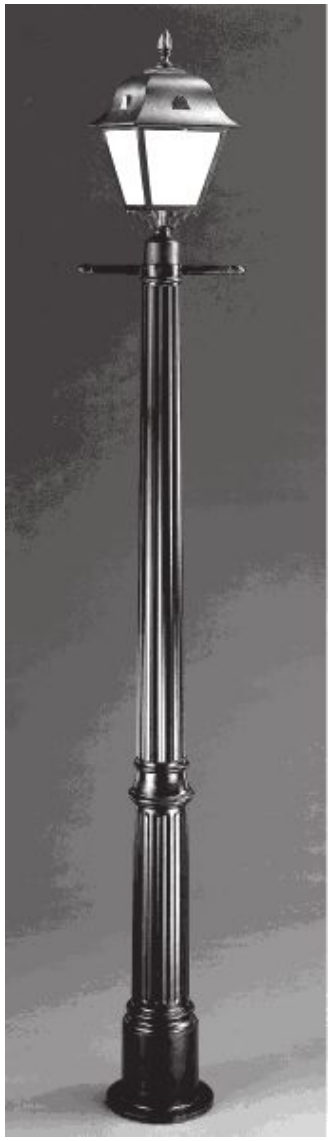
# SMC/BMC

- **EM-1212SF2** for all surfaces including steel
- **JB-5** for chrome – lowest cost, least build-up
- Polymeric releases
- Easy to use water-bases

# AXEL INT-DLP22E

- INTERNAL MOLD RELEASE ADDITIVES
  - DCPD's, Ortho, Iso, V.E., resin blends
  - Excellent for reducing scumming
  - Improved ease of release
  - Ideally suited for today's low cost, difficult to process DCPD resins and DCPD blends.
  - Typically dosed at 1% by weight to the neat resin

# For Polyester or DCPD Molding



MoldWiz®

## INT-DLP22E

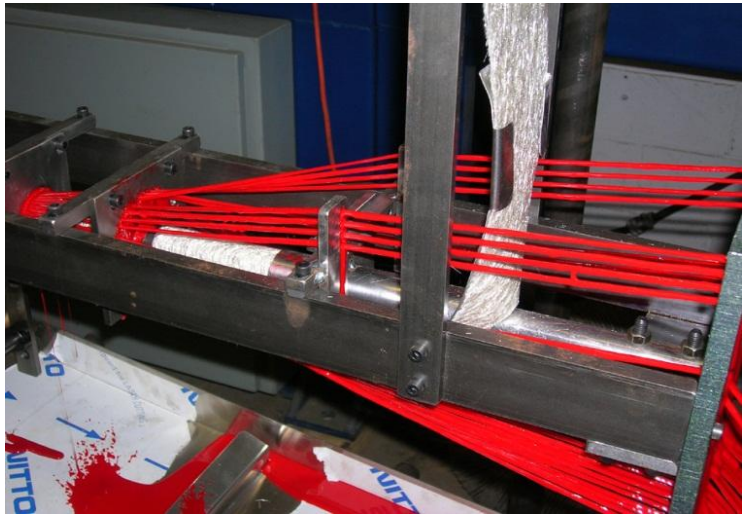
**Case History**

- DCPD resin - no gel coat
- Excellent release from core/mandrel
- Paintable

# AXEL INTERNALS

- INTERNAL MOLD RELEASE ADDITIVES – See our brochure
  - Also have a full line of internals for
    - Epoxies
    - Urethanes
    - Phenolics

# Pultrusion - Internal Release



MoldWiz®

## INT-PUL24

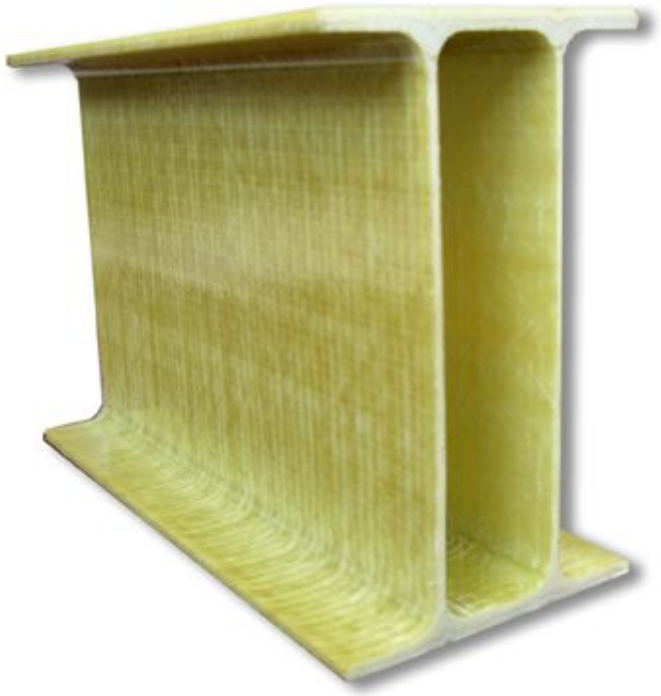
Polyester or vinyl ester pultrusion

MoldWiz®

## INT-PUL34

- Especially for highly filled resins
- Recommended for high ATH loading

# Pultrusion - Internal Release



FOR EPOXY

MoldWiz®

NEW

## INT-1888LE

MoldWiz®

NEW

## INT-1857DC

)LYURETHANE

MoldWiz®

## INT-1948MCH

# Research & Development at AXEL

New lubricants for pultrusion – lower cost, higher performance.

Water-based mould sealer

Many more developments…

# Mold Releases and Process Aid Additives


AXEL

***A system approach to success with Mold Release***