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New Generation of
Purging Compounds

Presenter: **Morteza Fathollahi**

Concept

- Why Purging Compound
- Purging Options
- How ULTRA PURGE works
- Applications
- Productivity & Cost Analysis
- Training & Technical Services

Why Purging Compound?

- How long does it take to complete a color/material change over?
- What's your plastic scrap rate?
- What does downtime really cost?
- Can you afford to lose a customer due to the quality failure?

Why Purging Compound?

When to purge

- Color Changes
- Carbon Removal
- Material Changes
- Start ups Shut downs

Vs in-house recycle resin

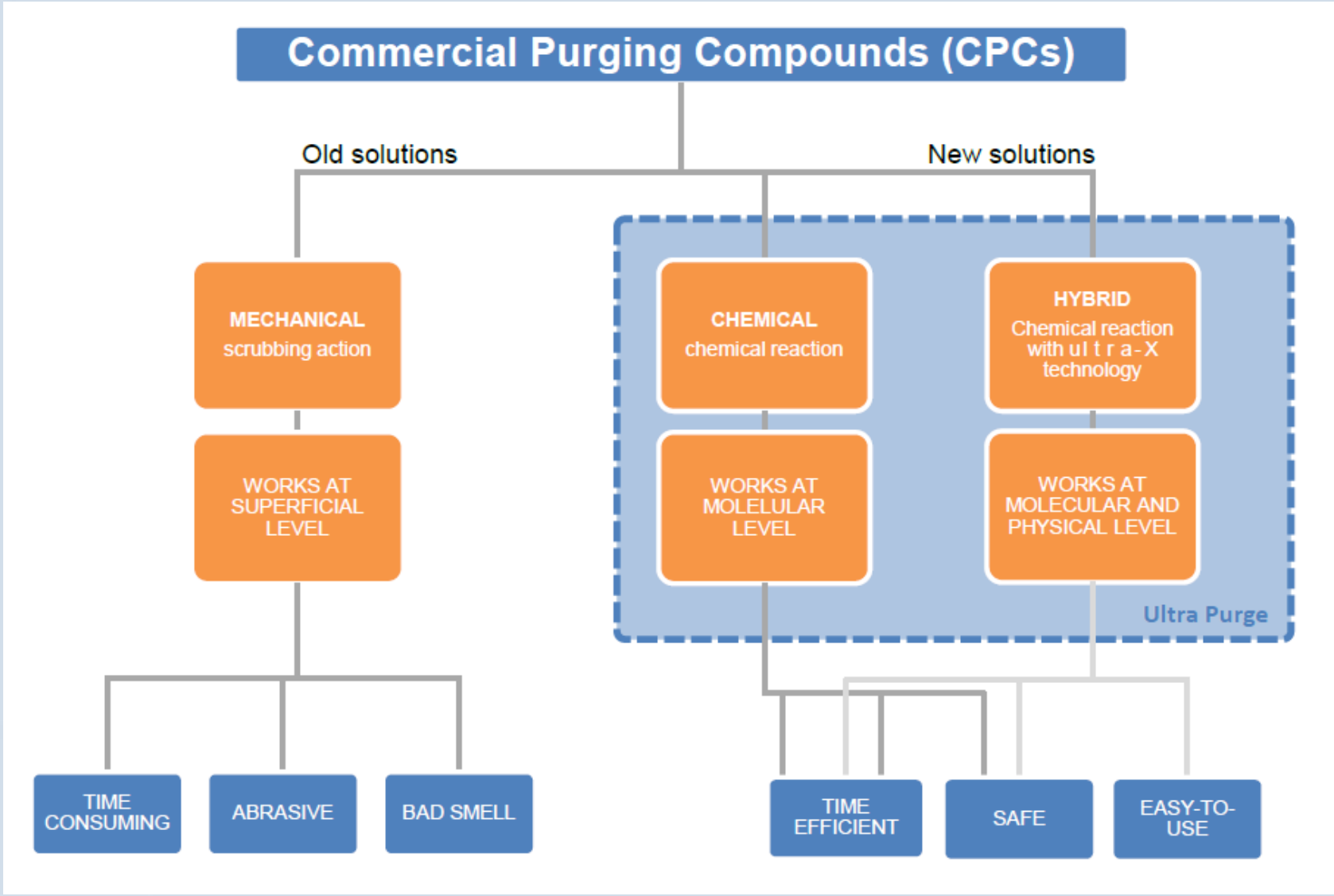
In-house Recycle Resin

- Replacing
- Pre-conditioning might be required
- Process condition adjustment
- Huge amount of material is needed
- Low heat resistant in long time

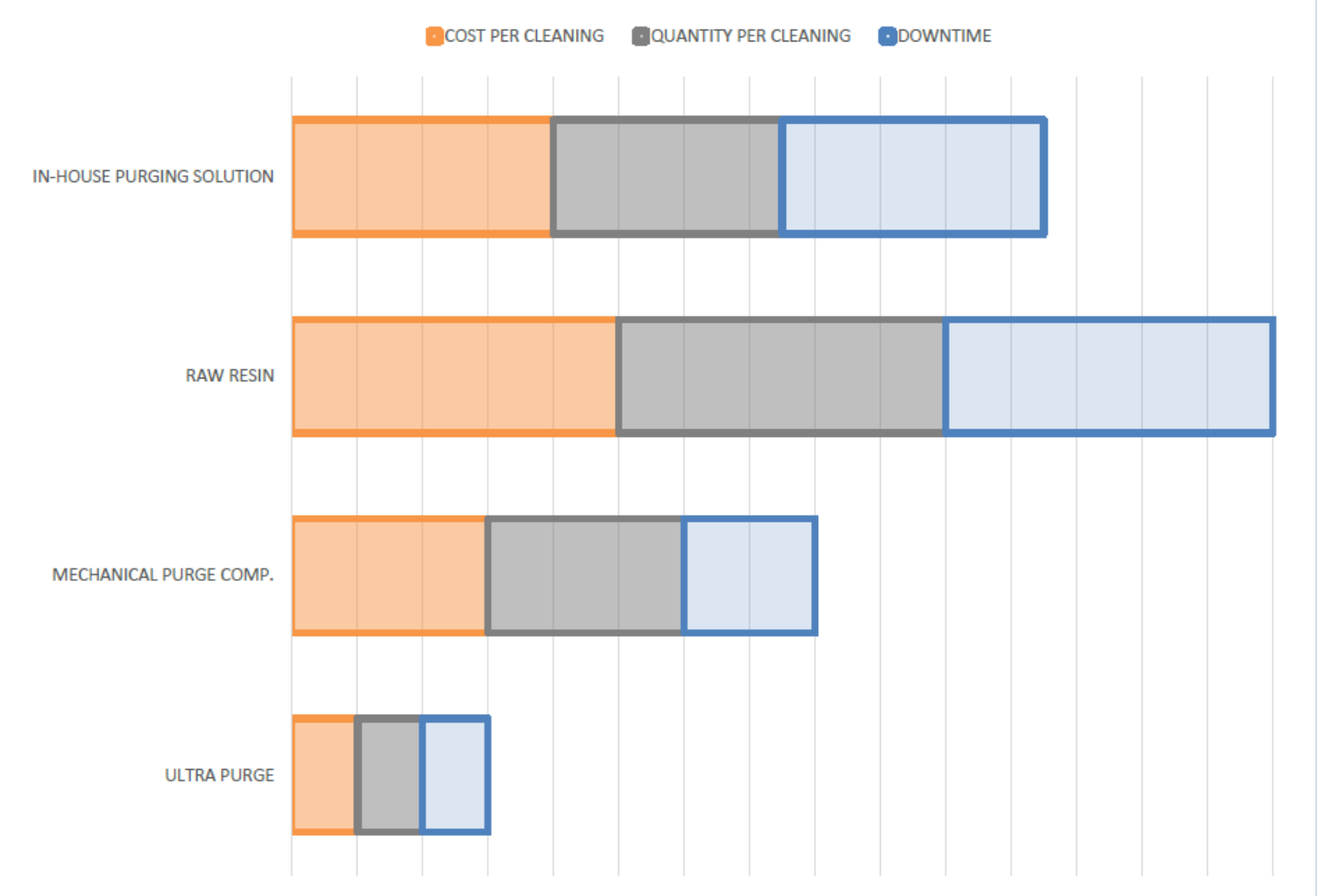
Purging Compound

- Purging
- Ready to use
- No change in process condition
- Small quantity is enough (few Kg)
- Suitable for Shut down / Start up

Commercial Purging Compounds



Purging Options



What is ULTRA PURGE?

- Ultra Purge is a Chemical or Hybrid Purging Compound in a ready-to-use or concentrated pellet form

- It is designed to clean screws, barrels, shooting pots and hot runners when changing color or removing carbon contaminations.

How ULTRA PURGE Works

Chemical Reaction	To break intra/inter molecular bonds	To Facilitate removing colorants and black specks
Expanding Agent	To expand during purging procedure	To reach to dead spots of extruder, die, nozzle, specially hot runners
Scrubbing Mineral*	To modify melt viscosity and improve scrubbing power	To fluid through very small gates (as little as 0.2 mm) without any abrasion and wearing

* Scrubbing Mineral introduced by ULTRA-X technology not in all grades; ULTRA-X technology is **100% non-abrasive**

Application

Processes:

- Injection Molding (Specially Hot Runners equipped)
- Blow Molding
- Cast & Blown Film Extrusion
- Fibers & Filaments
- Other Extrusions (Compounding, Pipe, etc.)

Polymers:

- HDPE, LDPE, LLDPE
- PP, TPO
- PVC, EVA, TPE, TPR, TPU
- HIPS, GPPS, ABS, SAN
- PET, PBT
- PA, PC, PMMA, POM
- PPS, PPO, PSU, PEEK

Productivity

Two significant costs are generated when purging:

- **Scrap**: Amount of resin and purging compound used to clean the machine
- **Downtime**: Amount of time used to purge/clean the machine. This is inclusive of:
  - Lost of Production
  - Energy used to run the machine while purging
  - Man power

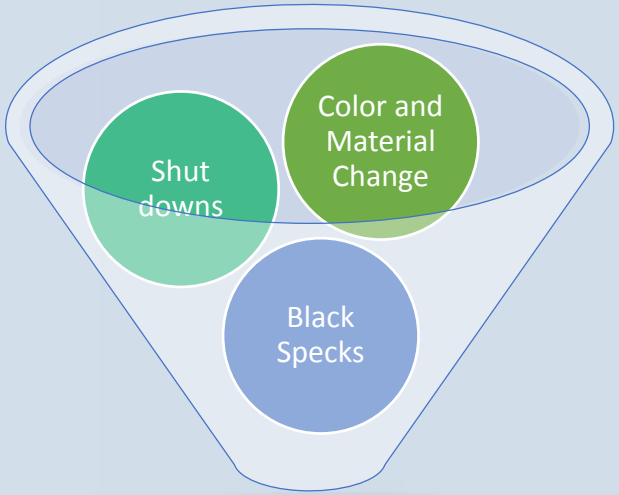
Scrap

- Scrap is normally the smallest component of the purging cost but it is definitely the most visible.
- Many companies monitor this as an indicator of efficient production.
- Reducing scrap during a color change can only be achieved by using a purging compound.

Downtime

- Downtime is normally largest component of the purging cost when analyzing the purging process.
- Fast purging means gaining production up time as well as reducing the cost of energy and manpower.
- Purging compound are designed to reduce downtime making color and material changes faster.

Productivity



Reduce Scrap 30 to 80%

Reduce Cost

Reduce Downtime 50 to 85%

Improve Productivity

Cost Analysis: Case Study

Case 1- Door Panel; Color change from Black to Beige base on PP

Process	Inj. Molding
Machine Size (Ton)	900
Shot Size (gr)	453
Cycle Time (s)	375
Mold Type	Hot Runner
Cavities	2
Barrel Capacity (Kg)	4.5

Item	Unit	Without Ultra Purge	With Ultra Purge
Used Virgin Resin	Kg	45	6.4
Price of Virgin Resin	Rls/Kg	42000	42000
Used Ultra Purge	Kg	0	1.4
Price of Ultra Purge	Rls/Kg	380000	380000
Total Material Cost	Rls	1890000	800800
Time Required for Purging	min	30	15
Downtime Cost	Rls/min	20000	20000
Total Downtime cost	Rls	600000	300000
Total Cost per Purging	Rls	2490000	1100800

Scrap Cost Reduction %	58
Downtime Cost Reduction %	50

Color Change Time per Week	2
Macine Sets	16
Saved Cost per Purging (Rls)	1389200
Annually Total Saved (million Rls)	2312

Cost Analysis: Case Study

Case 2- Bottle Preform; Color change from Amber to Natural base on PET

Process	Inj. Molding
Machine Size (Ton)	300
Mold Type	Hot Runner

Item	Unit	Without Ultra Purge	With Ultra Purge
Used Virgin Resin	Kg	128	27
Price of Virgin Resin	Rls/Kg	30000	30000
Used Ultra Purge	Kg	0	3.2
Price of Ultra Purge	Rls/Kg	600000	600000
Total Material Cost	Rls	3840000	2730000
Time Required for Purging	min	200	60
Downtime Cost	Rls/min	25000	25000
Total Downtime cost	Rls	5000000	1500000
Total Cost per Purging	Rls	8840000	4230000

Scrap Cost Reduction %	29
Downtime Cost Reduction %	70

Color Change Time per Week	1
Macine Sets	8
Saved Cost per Purging (Rls)	4610000
Annually Total Saved (million Rls)	1918

Cost Analysis: Case Study

Case 3- Car Part; Color change from Black to Grey base on PP, Ultra Purge vs other commercial purging compound

Process	Inj. Molding
Machine Size (Ton)	3000

Item	Unit	With other Purging	With Ultra Purge
Used Virgin Resin	Kg	20	10
Price of Virgin Resin	Rls/Kg	68000	68000
Used Ultra Purge	Kg	24	11
Price of Ultra Purge	Rls/Kg	200000	380000
Total Material Cost	Rls	6160000	4860000
Time Required for Purging	min	30	14
Downtime Cost	Rls/min	21000	21000
Total Downtime cost	Rls	630000	294000
Total Cost per Purging	Rls	6790000	5154000

Scrap Cost Reduction %	21
Downtime Cost Reduction %	53

Color Change Time per Week	2
Macine Sets	2
Saved Cost per Purging (Rls)	1636000
Annually Total Saved (million Rls)	340

Cost Analysis: Case Study

Case 4- Bottle cap; Color change from Red to White base on HDPE

Process	Inj. Molding
Mold Type	Hot Runner
Machine Size (Ton)	300

Item	Unit	Without Ultra Purge	With Ultra Purge
Used Virgin Resin	Kg	125	25
Price of Virgin Resin	Rls/Kg	39000	39000
Used Ultra Purge	Kg	0	7
Price of Ultra Purge	Rls/Kg	380000	380000
Total Material Cost	Rls	4875000	3635000
Time Required for Purging	min	240	60
Downtime Cost	Rls/min	20000	20000
Total Downtime cost	Rls	4800000	1200000
Total Cost per Purging	Rls	9675000	4835000

Scrap Cost Reduction %	25
Downtime Cost Reduction %	75

Color Change Time per Week	3
Macine Sets	5
Saved Cost per Purging (Rls)	4840000
Annually Total Saved (million Rls)	3775

Quality

Using Ultra Purge:

- will reduce the rejects due to black specks and color streaking.
- will eliminate 100% of all remnants of color and resin that can potentially generate black specks or color streaking during production.
- will remove carbon deposits generated from thermo-sensitive resins.

ULTRA PURGE Benefits

- Very efficient & productive in purging process
- Wide range of grades for different processes & polymers
- Easy to be removed from the machine
- Food contact certified by EU and FDA regulation
- 100% safe; All ingredients are GRAS from the FDA
- Ready & easy to use
- Odorless; It does not produce dangerous gases
- Available in Pooya Polymer Tehran warehouse
- Technical service by Pooya Polymer Tehran technical team

Training

Correct Purging Procedure

On-site training to help the operators deal with the purging task:

- **When to use ULTRA PURGE**
- **Which ULTRA PURGE**
- **How much ULTRA PURGE**
- **How to use ULTRA PURGE**
- **When NOT to use ULTRA PURGE**

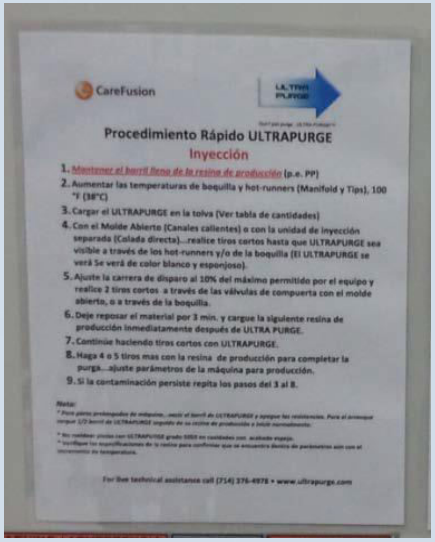
ULTRA PURGE Grades

GRADES	TEMPERATURE RANGE				DESIGNED FOR	DESCRIPTION
	T min °C	T max °C	T min °F	T max °F		
HIGH-E™	190	320	374	608	ABS, PA, PS (crystal), GPPS, HIPS, PC, PMMA, SAN, PBT, PET...	Ready-to-use chemical purging compounds
LOW-E™	140	260	284	500	PVC, EVA, TPE, POM, TPR, TPU...	
PET-E™	190	320	374	608	PET	
P-O™	170	300	338	572	PP, PE, HDPE, LDPE, LLDPE, HIPS, GPPS, TPO	
PC™	220	340	428	664	ANY RESINS GOING TO PC	
PMMA™	200	280	392	536	ANY RESINS GOING TO PMMA OR PA12	
5150™	160	350	320	662	All resins within temperature range	Ready-to-use hybrid purging compounds with ultra-X™ technology
5160™	190	320	374	608	ABS, PA, PS (crystal), GPPS, HIPS, PC, PMMA, SAN, PBT, PET...	
HT™	200	380	392	716	PEEK, PPS, PPO, ULTEM, GRIVORY HT...	Ready-to-use hybrid purging compounds
ME-C™	190	350	374	662	All resins within temperature range	
HT+™	250	400	482	752	PPS, PPO, PEEK, PSU, ULTEM...	
9010™	140	320	284	608	TPR, TPE, PVC, EVA, POM, PS, ABS, PA, PC, PBT, PPO, PMMA, PET...	Concentrate chemical purging compounds
9015™	140	300	284	572	PP, PE, HDPE, LDPE, LLDPE, HIPS, GPPS, TPO...	
BP™	170	380	338	716	PP, PE, HDPE, LDPE, LLDPE, HIPS, GPPS, TPO...	
PET-C™	190	320	374	608	PET	
PO-C™	170	320	338	608	PP, PE, HDPE, LDPE, LLDPE, HIPS, GPPS, TPO...	

Training

A laminated custom made procedures alongside with scoops or buckets for easy dosage are provided.

Easy, Ready, Quick & Error-free



CareFusion

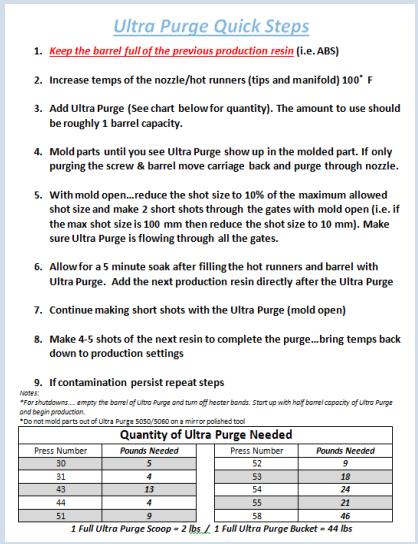
Procedimiento Rápido ULTRAPURGE

Inyección

1. Mantener el barril lleno de la resina de producción (p.e. PP)
2. Aumentar las temperaturas de boquilla y hot-runners (Manifold y Tips), 100 °F (38°C)
3. Cargar el ULTRAPURGE en la tolva (Ver tabla de cantidades)
4. Con el Molde Abierto (Canales calientes) o con la unidad de inyección separada (Colada directa)...realice tiros cortos hasta que ULTRAPURGE sea visible a través de los hot-runners y/o de la boquilla (El ULTRAPURGE se verá Se verá de color blanco y esponjoso).
5. Ajuste la carrera de disparo al 10% del máximo permitido por el equipo y realice 2 tiros cortos a través de las válvulas de compuerta con el molde abierto, o a través de la boquilla.
6. Deje reposar el material por 3 min. y cargue la siguiente resina de producción inmediatamente después de ULTRA PURGE.
7. Continúe haciendo tiros cortos con ULTRAPURGE.
8. Haga 4 o 5 tiros mas con la resina de producción para completar la purga...ajuste parámetros de la máquina para producción.
9. Si la contaminación persiste repita los pasos del 3 al 8.

Nota:

For free technical assistance call (714) 376-4978 • www.ultrapurge.com



Ultra Purge Quick Steps

1. *Keep the barrel full of the previous production resin* (i.e. ABS)
2. Increase temps of the nozzle/hot runners (tips and manifold) 100˚ F
3. Add Ultra Purge (See chart below for quantity). The amount to use should be roughly 1 barrel capacity.
4. Mold parts until you see Ultra Purge show up in the molded part. If only purging the screw & barrel move carriage back and purge through nozzle.
5. With mold open...reduce the shot size to 10% of the maximum allowed shot size and make 2 short shots through the gates with mold open (i.e. if the max shot size is 100 mm then reduce the shot size to 10 mm). Make sure Ultra Purge is flowing through all the gates.
6. Allow for a 5 minute soak after filling the hot runners and barrel with Ultra Purge. Add the next production resin directly after the Ultra Purge
7. Continue making short shots with the Ultra Purge (mold open)
8. Make 4-5 shots of the next resin to complete the purge...bring temps back down to production settings
9. If contamination persist repeat steps

Notes:
*For shutdowns.... empty the barrel of Ultra Purge and turn off heater bands. Start up with half barrel capacity of Ultra Purge and begin production.
*Do not mold parts out of Ultra Purge 5050/5060 on a mirror polished tool

Quantity of Ultra Purge Needed

Press Number	*Pounds Needed*	Press Number	*Pounds Needed*
30	*5*	52	*9*
31	*4*	53	*18*
43	*13*	54	*24*
44	*4*	55	*21*
51	*9*	58	*46*

1 Full Ultra Purge Scoop = 2 lbs. / 1 Full Ultra Purge Bucket = 44 lbs

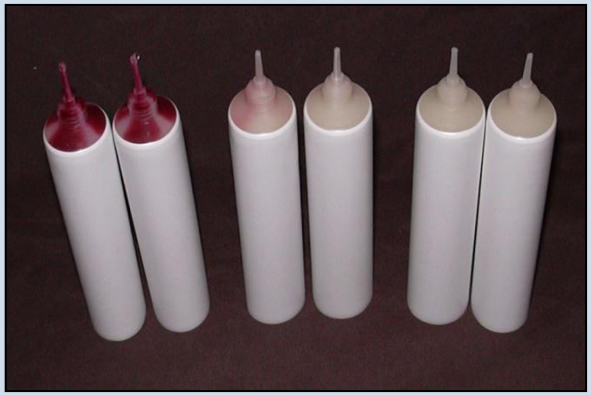
Examples of Application

Closures

Medical Application

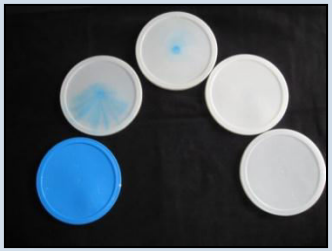
Automotive Parts

Hot runners



PVC Degradation Removal

Caps



THANK YOU

Morteza Fathollahi
Business Development Manager
POOYA POLYMER TEHRAN
mobile: +98 912 2959 312
email: m.fathollahi@pooyapolymertehran.com