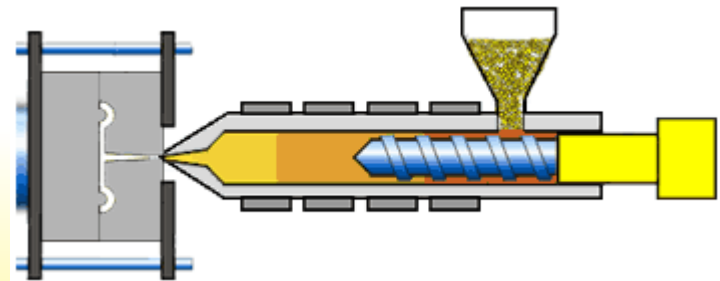




# PCR / PIR

Injection



**Key Technology**

**Complete Formulation**

# **Engineering Plastics**

# Before Improvement

PC/ABS  
Virgin 75%



PC/ABS  
Recycle 25%



# After injection molding



**Virgin 75% mixed with scraps 25%**

**Serious jetting, product does not meet the standard**

# After Improvement

PC/ABS  
Virgin 25%



PC/ABS  
Recycle 75%



## After injection molding



**Complete formulation:**

**Virgin 25 : Recycle 75 100%**

**YT-886 0.2 phr**

**YT-1818 0.2 phr**

- Reduce defects, scraps/runners can be totally recycled, advantage of using more recycled materials, reduce carbon footprint, reduce costs and increase efficiency.
- Increase operating range.
- Expand material option.

# Injection molding of engineering plastics PC/ABS

## Data comparison

Drying Temp. (°C)	Before 80 / After 80	Test Period No Change
Drying Time (hrs)	Before 4 / After 4	Test Period No Change
Molding Temp. (°C)	Before 285/285/280/265/220 After 280/275/270/240/200	↓9%
Cycle Time (sec)	Before 33 / After 29	↓12%
Pressure (MPa)	Before 135 / After 120	↓11%
Speed (rpm)	Before 35 / After 45	↑29%
Mold Temp. Range (°C)	CAVITY Before 80 / After 90 CORE Before 66 / After 60	↑11%
Cooling Time (sec)	Before 15 / After 12	↓20%

# Laptop - SOPs designated by major brands

*lenovo*



Implementation of PCR / PIR standard



# Nylon PA6

## Luggage parts



**NG scrap  
100%**

**Complete formulation :**

**YT-886 0.2 phr**

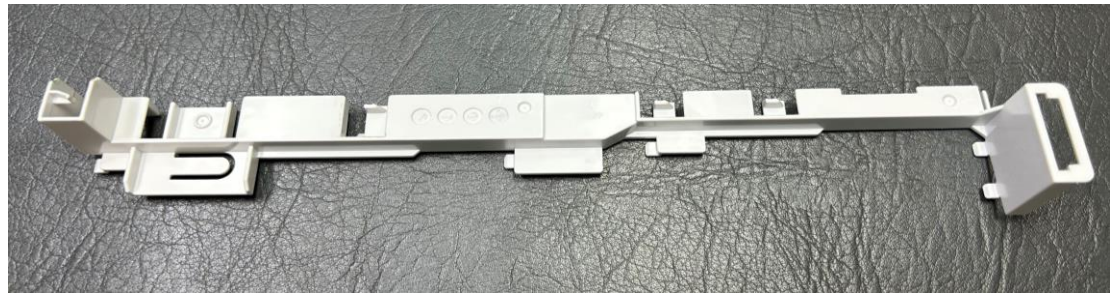
**YT-1818 0.1 phr**

- Appearance, Lab value, strength, all meet the standards
- Cycle time 70.7 → 68 sec.
- Cooling time 45 → 30 sec.



# ABS+PC Alloy

## Parts for printers and copiers



Complete formulation :

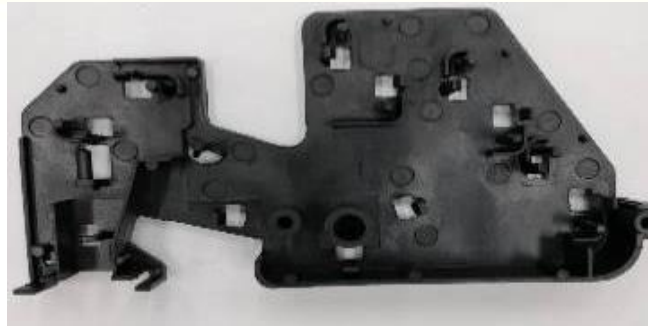
**YT-886 0.3 phr**

**YT-1818 0.1 phr**

Virgin 65%  
NG scrap 35%

- Appearance, Lab value, strength, all meet the standards
- Injection temp. 245°C → 230°C
- Cycle time 35 → 20 sec.

# PBT + 30%GF FR V0



Parts for microwave  
food dryer

Virgin 65%  
NG scrap 35%

Complete formulation :

**YT-886 0.3 phr**

**YT-1818 0.1 phr**

- No need for mold release agent
- Appearance, Lab value, strength, all meet the standards
- Injection temp. 285°C → 260°C
- Cycle time 70.7 → 58.1 sec.

# PET + 35%GF FR V0

## Parts for printers and copiers



Virgin 50%  
NG scrap 50%

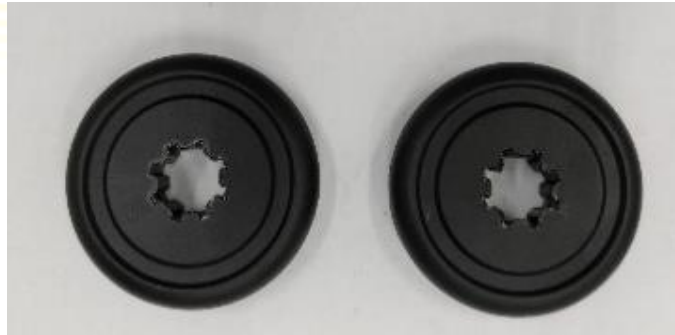
Complete formulation :

**YT-886 0.3 phr**

**YT-1818 0.15 phr**

- Appearance and strength meet the standards
- Anti-floating fiber
- Cooling time 30 → 20 sec.

# TPU 95A



**Luggage  
wheels**

**Virgin 50%**  
**NG scrap 50%**

**Complete formulation :**

**YT-886 0.2 phr**

**YT-2236 0.2 phr**

- Appearance, Lab value, strength, all meet the standards
- No need for mold release agent
- Holding pressure 55→70%, holding time 5→6 sec.
- Production speed ↑ 3~5%

# Nylon PA66



**Luggage parts**

**NG scrap  
100%**

**Complete formulation :**

**YT-886 0.2 phr**

**YT-1818 0.1 phr**

- Appearance, Lab value, strength, all meet the standards
- No need for mold release agent

# Nylon PA66



Car seat headrest  
locking clips

**NG scrap  
100%**

**Complete formulation :**

**YT-886 0.2 phr**

**YT-1818 0.1 phr**

- Appearance, Lab value, strength, all meet the standards
- Injection temp. 240°C → 220°C
- Cooling time 35 → 25 sec.



# **Commodity Plastics**

# HDPE Application



HDPE scrap



Original product

After improvement

## Key technology:

HDPE	100%
YT-586N	0.1 phr
YT-300	0.1 phr

## Effectiveness:

1. Color rendering.
2. Production speed  $\uparrow$ 7% in the first 20 minutes, after that  $\uparrow$ 15%.
3. Toughness OK.
4. Reduce costs by using inferior materials or calcium carbonate.

# HDPE Application



HDPE scrap

**Key technology:**

HDPE 100%

YT-300 0.05 phr

YT-2236 0.2 phr

Original product



Original product  
Short shot



After improvement  
Color rendering



Add 20% of  $\text{CaCO}_3$   
Toughness test → Passed

After improvement



Original product

**Product : Fish tray**

**Formula : HDPE scrap 100% + YT-300 0.05 phr + YT-2236 0.2 phr**

## Comparison of Improvement

Injection Molding	Before	After	Efficiency
Pigment	150 g	140 g	↓ 6.7 %
Glossiness		Improved	Good
Molding Temperature	210/210/210/210/210 °C		↓ 9.5 %
	190/190/190/190/190 °C		
Cycle Time	35/10/10 sec.	30/8/7 sec.	↓ 18.2 %
Injection Pressure	90 MPa	80 MPa	↓ 11.1 %
Mold Release Agent	Use silicone	No need silicone	Good
CaCO <sub>3</sub>	0 kg	10~15 kg	↑ 10~15 %
Cooling Time	10 sec.	7 sec.	↓ 30 %

## Construction tools PP project:

Materials	Ratio
PP woven bag, black	50
PP multilayer film, green	50
CaCO <sub>3</sub> masterbatch	10 phr
YT-586N	0.15 phr
YT-300	0.15 phr



Mixed evenly, direct injection

QC toughness test → Passed

Finished Product

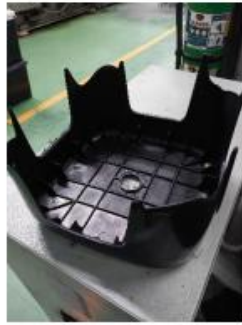




## PP original product



PP scrap 90%  
PE off-grade 10%



Short shot



NG rate 10%

Other problems  
Inconsistent weight  
Flash  
Brittle  
Nozzle clogged

## PP after improvement

### Key Technology

PP 90% + PE 10% + YT-586N 0.15phr + YT-300 0.15phr



Cavity fully filled



Consistent weight



Easy to deflash



Defect-free ↑ 7%  
Production speed ↑ 5%



No release agent  
required



# PP Application



Material	Dosage
PP recycle	65
PP scrap	34
2200 BK	1
YT-300	0.1 phr
YT-2236	0.1 phr

No.	Test Item	Test Result
1	Glossiness	Much glossier
2	Odor	Odor removed
3	Color	Jet black increased
4	Elasticity	Better stiffness, good effect
5	Injection temp.	Each section ↓10°C
6	Cycle time	Shortened 1.5~1.8 sec.

# PP Application

## Luggage parts



Complete formulation :

**YT-300 0.2 phr**

**YT-2236 0.2 phr**

Virgin 65%  
NG scrap 35%

- Appearance, Lab value, strength, all meet the standards
- Remove burrs
- Injection temp. 240°C → 230°C
- Cooling time 40 → 30 sec.

# YT-300

**Substitute** → paraffin oil / mold release agent **2 in 1**



No need paraffin oil



No need  
mold release agent



## Plastic Household

NG → Low production speed,  
poor demolding, piercing  
through, flash.

**PP recycle 100%**

**YT-300 0.1~0.2 phr**

- \* Cavity fully filled, easy molding
- \* Demolding OK
- \* No piercing through
- \* Reduce flash, shorten deflashing time
- \* Glossiness ↑
- \* Output ↑ >15% significantly

# YT-300 + YT-2236

**Substitute** → paraffin oil / mold release agent / dispersant **3 in 1**



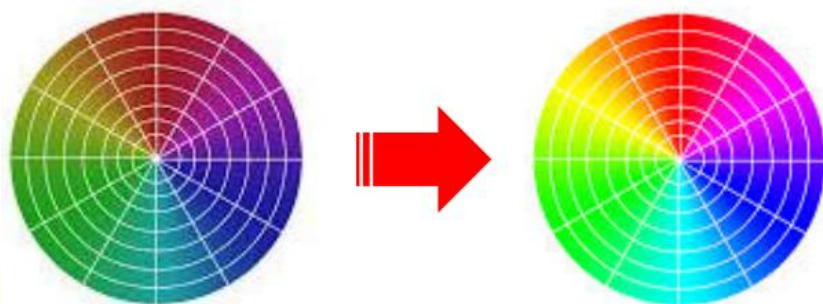
No need paraffin oil



No need mold release agent



No need dispersant



Color Rendering Index (CRI)



Increase Output