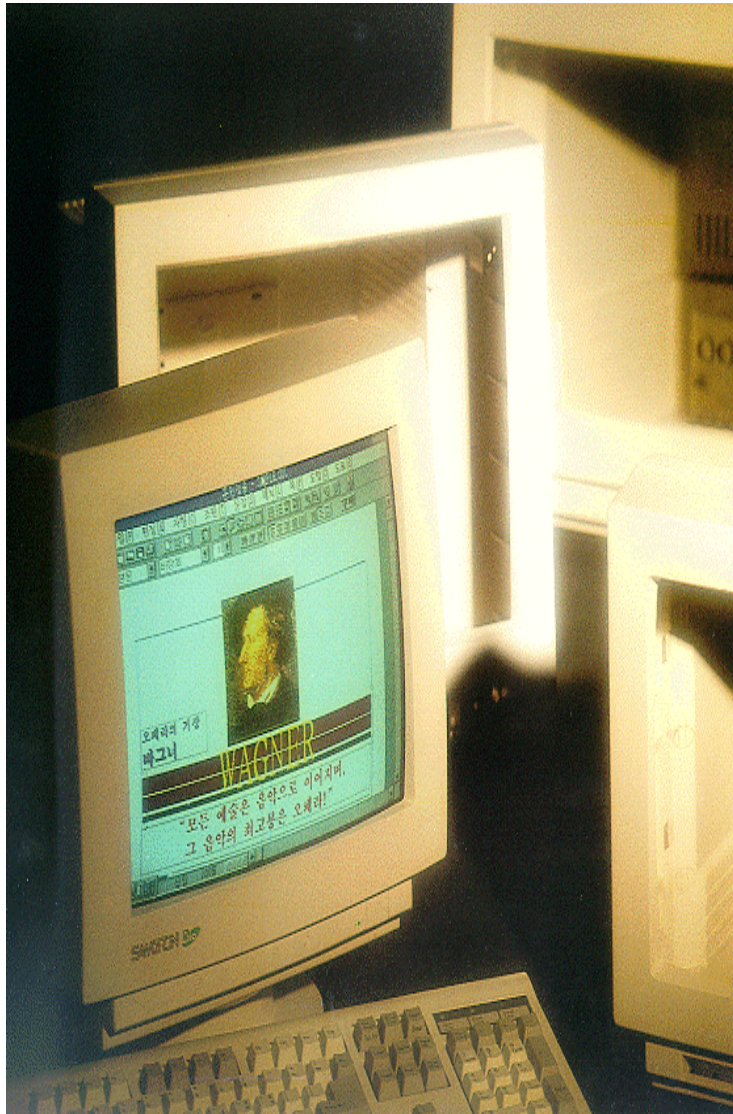




Cheil Industries Inc.

Application Guide



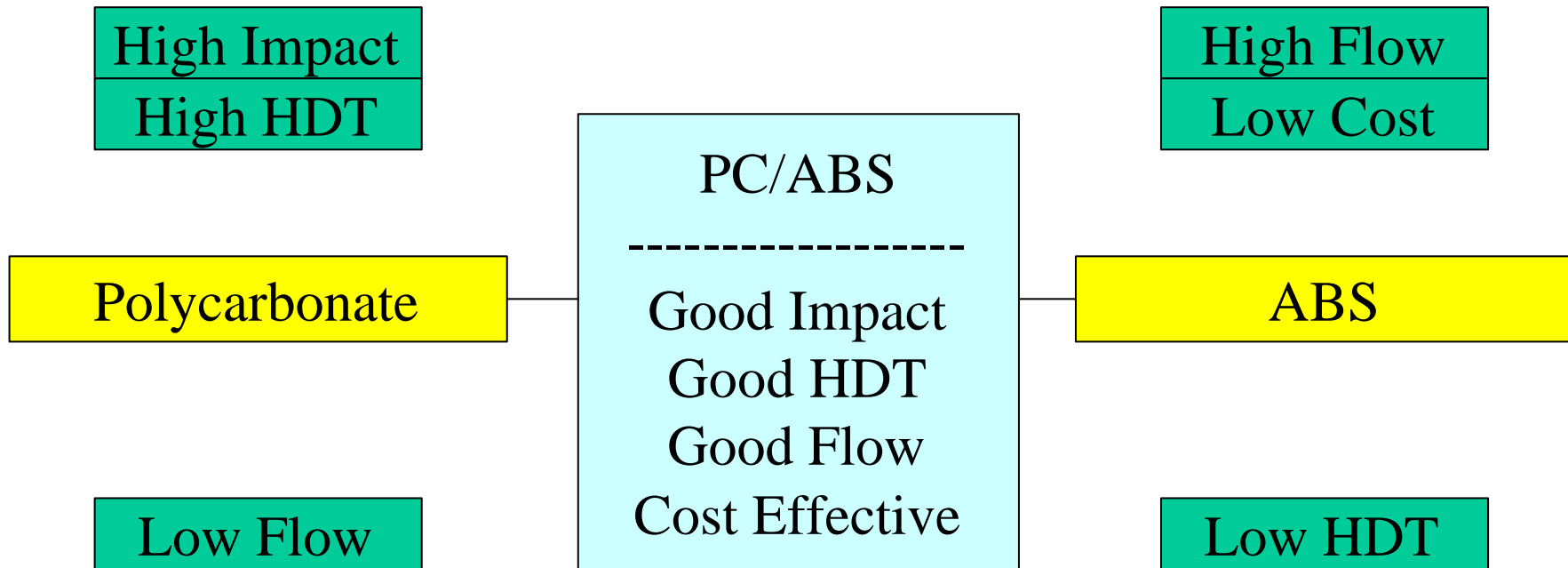
SAMSUNG

Engineering Thermoplastics STAROY Halogen-free PC/ABS NH-Series



Introduction

Concept of PC/ABS Blend



Characteristics of NH-Series

Flame Retardants

Non-Halogen

Flammability

UL94 V-0 & UL94 5V

Juicing Crack Free

**Non Juicing(Stress) Crack
after injection molding**

Good Processability

**High Melt & Spiral flow
Easy Injection Molding**

High UV-Resistance

**Excellent Weatherability
deltaE < 1.0 by ASTM
D4459
with *Low Density***

Characteristics

Non-halogen Flame Retardant

Staroy NH-Series is a flame retardant PC/ABS containing non-halogen flame retardant which is non-toxic and environmentally stable. The flame retardants used in NH-Series do not violate any regulations or bans of environmental protection in Europe.

Suitability for TCO, Blue-angel requirements

Since flame retardants of Staroy F.R.PC/ABS NH-Series are non-halogen and non-toxic, Staroy F.R.PC/ABS NH-Series meet the requirements of Ecolabels like TCO in Sweden, Blue-angel in Germany.

Characteristics

High Quality Control

Since Staroy F.R.PC/ABS NH-Series are produced by modern Facilities, high levels of contamination control, color stability and quality are guaranteed.

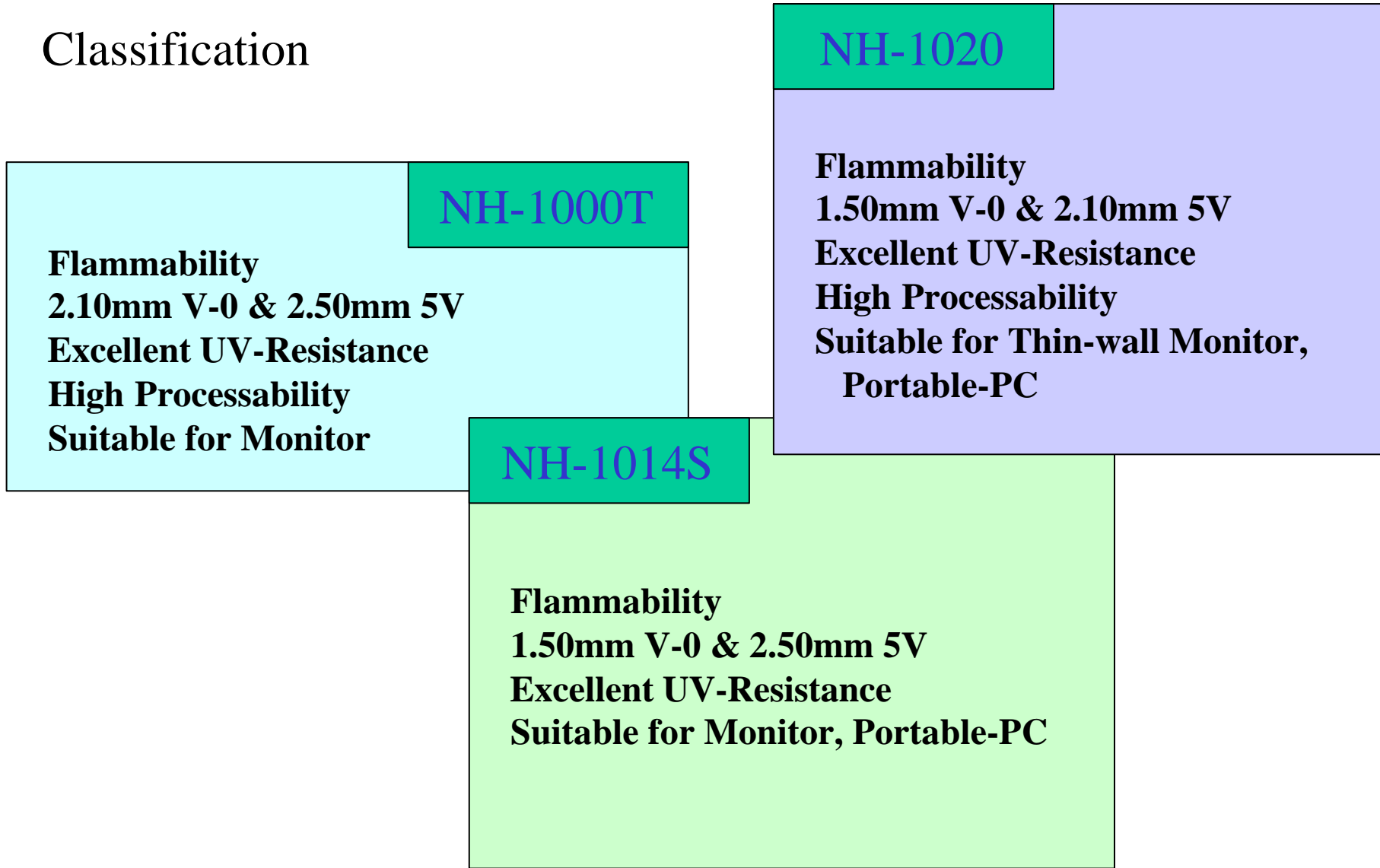
Good Processability

Higher levels of productivity can be achieved with processability of Staroy F.R.PC/ABS.

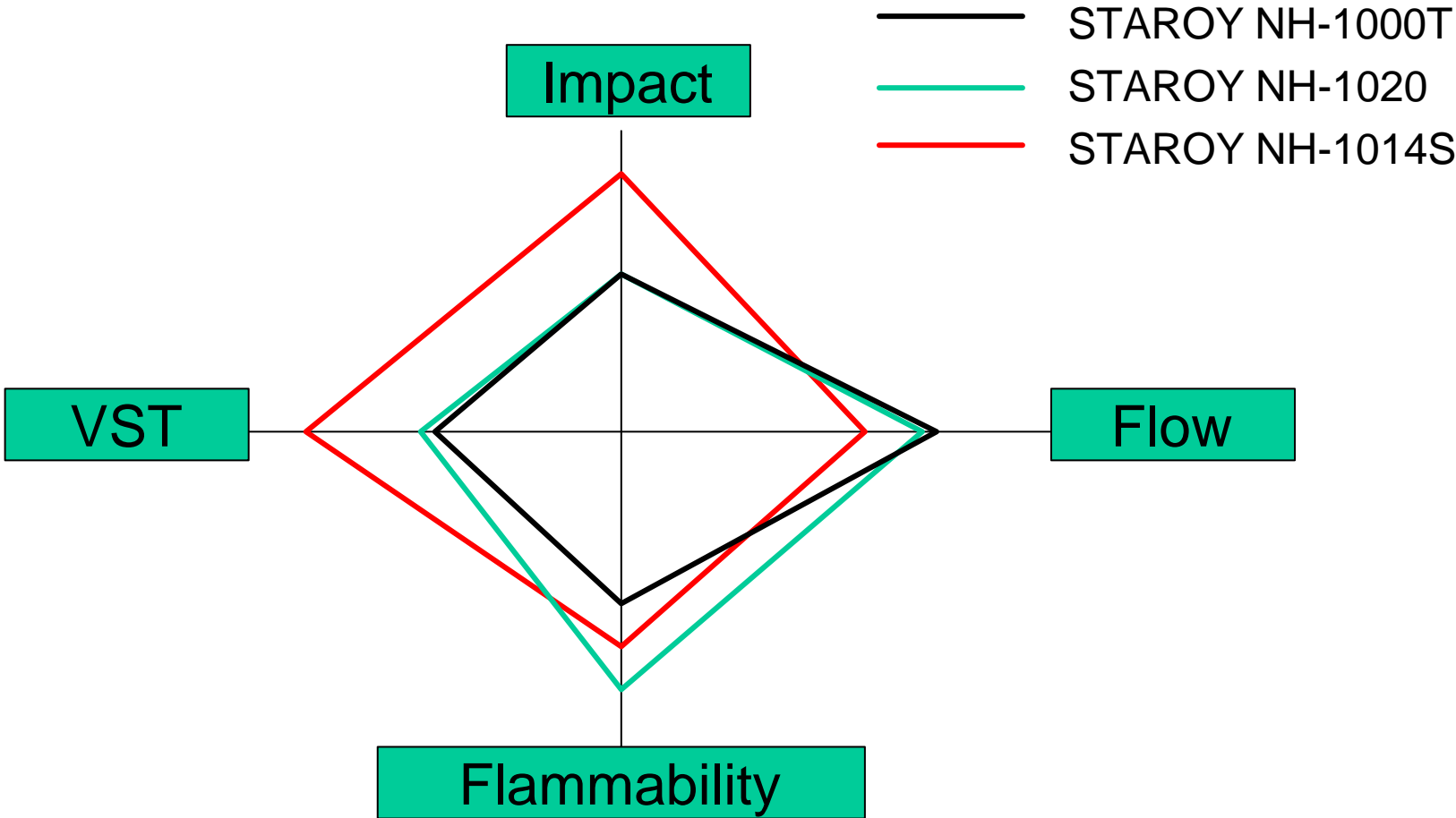
Variety of grades

Staroy F.R.PC/ABS NH-Series feature various grades that can be used to meet all customer's requirement especially for the housing of monitor, portable PC.

Classification



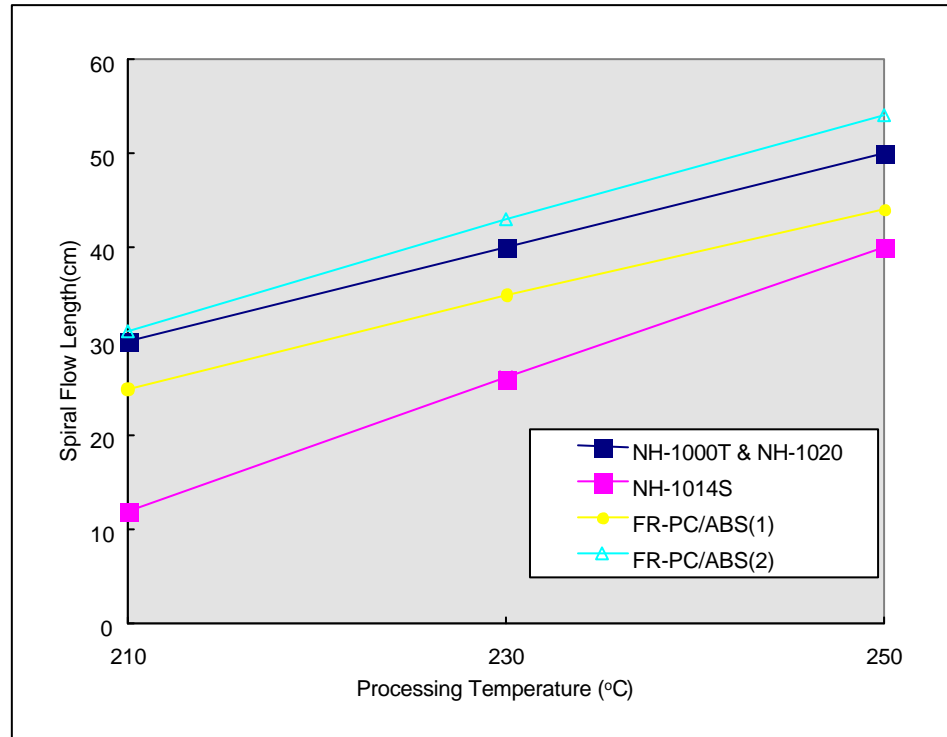
Balance of Properties



Spiral Flow Length of NH-Series

Spiral flow length of Staroy F.R.PC/ABS NH-Series, especially NH-1000T & NH-1020, is very long, it is very suitable for the injection molding of monitor and portable-PC housing.

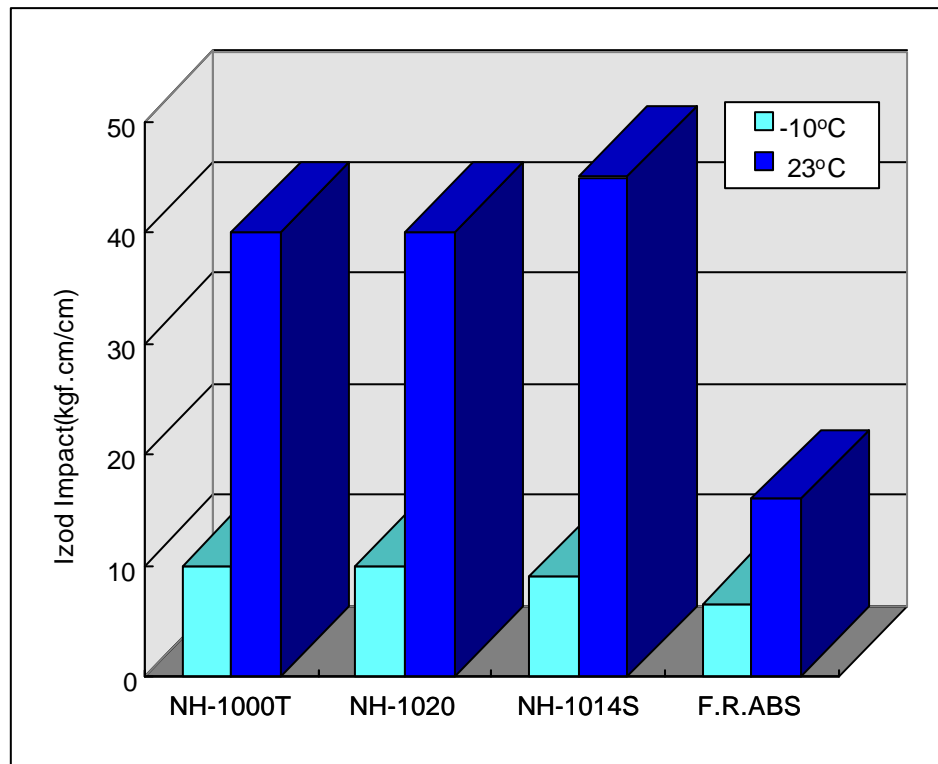
Injection Machine: 150Ton(10 Oz)
Wall Thickness: 2mm
Injection Speed: 80%
Injection Pressure: 80%



Impact Strength of NH-Series

Staroy F.R.PC/ABS NH-Series show relatively high Izod Impact strength at room temperature and low temperature.

Test Method: ASTM D256
Test Condition: 23°C, -10°C
1/8" Specimen
Notched



UV-Resistance of NH-Series

NH-Series have an excellent UV-Resistance. Color change is less than 1.0(deltaE) after 300 hours' exposure to UV. NH-Series can meet various customer's requirements for UV-Resistance.

Test Method: ASTM D4459

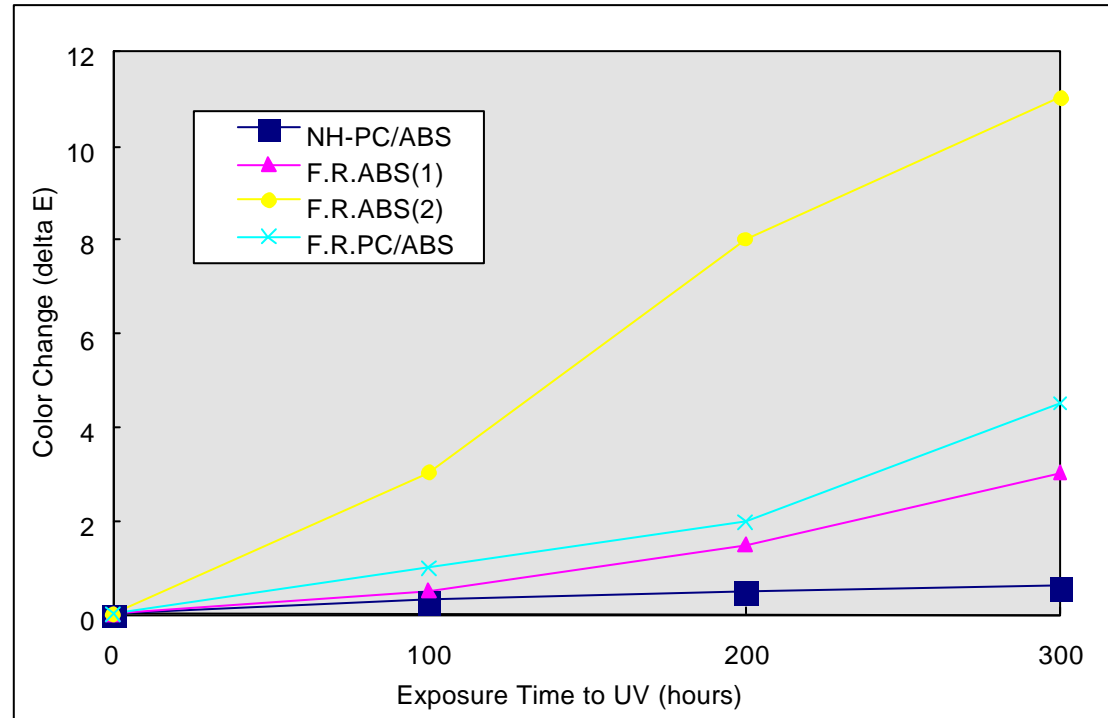
Test Hours: 300 hours

Test Color: C7536

IBM Pearl White

Color Checking Machine:

Minolta 3700d



Typical Processing Conditions

Drying

Staroy F.R.PC/ABS NH-Series absorb moisture in the air, like as most of thermoplastics, and this can cause the reduction of quality. Drying is necessary prior to injection molding of NH-Series. It is recommended to dry NH-Series in a **dehumidified dryer at 80°C for more than 2 hours**, and the drying temperature should **not be exceeded 85°C**. Excessive drying can cause color change or lumping of materials.

Injection Molding Conditions

The injection conditions of NH-Series are basically similar to those of general PC/ABS. The flame retardant used in NH-Series is chemically and thermally stable during the usual injection molding process. However, **local temperature increase or excessive friction heat can cause the thermal decomposition of PC/ABS**. The table in next page is the general guidance for injection molding condition of Staroy F.R.PC/ABS NH-Series.

Injection molding of STAROY NH-Series

Items	Conditions
Drying Temperature	80°C
Drying Time	2 ~ 4 Hours
Processing Temperature	200°C ~ 240°C
Mold Temperature	30°C ~ 40°C
Charging Speed(RPM)	50 ~ 80
Injection Pressure	750 ~ 1150 kg _f /cm ²
Back Pressure	5 ~ 20 kg _f /cm ²

Physical Properties of STAROY PC/ABS NH-Series

Properties at 23°C	Test Method	Test Condition	Unit	NH-1000T	NH-1020	NH-1014S
Physical Properties						
Specific Gravity	ASTM D792	Natural Color	-	1.18	1.18	1.20
Spiral Flow Length	Cheil	250°C, 2mm	cm	50	50	40
Mold Shrinkage	ASTM D955	-	mm/mm x 10 ⁻²	0.5~0.7	0.5~0.7	0.5~0.7
Mechanical Properties						
Tensile Strength	ASTM D638	5 mm/min	kgf/cm ²	600	600	650
Flexural Strength	ASTM D790	2.8 mm/min	kgf/cm ²	800	800	900
Flexural Modulus	ASTM D790	2.8 mm/min	kgf/cm ²	26,000	26,000	26,000
Izod Impact Strength (notched)	ASTM D256	1/8 inch	kgfcm/cm	40	40	45
Rockell Hardness	ASTM D785	R-scale	-	117	117	117
Thermal Properties						
Heat Distortion Temperature, 1/4"	ASTM D648	18.56 kgf/cm ²	°C	80	80	93
Vicat Softening Temperature	ISO R306	5 kgf/cm ²	°C	90	90	103
Flammability						
UL	UL94	-	Recognized	V-0(2.10mm)	V-0(1.50mm)	V-0(1.50mm)
				5VA(2.50mm)	5VB(2.10mm)	5VB(2.50mm)