

POKETONE FOR PLASTIC TOYS

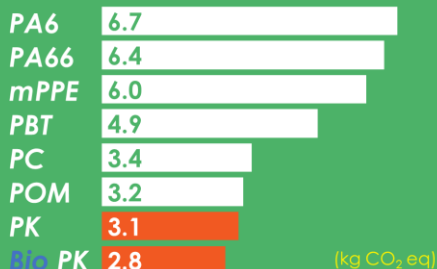


Non Toxic High Efficiency

Acrylate Free
Melamine Free
Bisphenol A Free
Formaldehyde Free
Lead/ Chrome/ Free
Phthalate Free



Global Warming Potential



* mPPE data is based on the thesis "A Comparative Life Cycle Assessment of Alternative Polymers to Poly(vinyl-chloride) for Use in Flooring Applications by Lund University.

* Other ETP data is based upon the Eco-profiles data from www.plasticseurope.org

* PK data are based upon Ecovincent database according to ISO Standard 14040 and 14044.

Bio PK data are based on 46% bio-ethylene content.
- Biomass uptake: 1.445kg CO₂ eq



POKETONE?

HYOSUNG POKETONE is a new class of engineering thermoplastics which are compose of carbon monoxide, ethylene and propylene, it is called as aliphatic polyketone. As a kind of semi-crystalline plastic,

**Why POKETONE is used for Toys?

Children feel safe to a characteristic of POKETONE’s resilience. POKETONE is non-toxic, and free of formaldehyde, heavy metal and acrylonitrile

POKETONE SUCCESSFUL STORIES FOR TOYS

- McDonalds RSS Pass : M330, M630
- HASBRO SRS Pass : M330

POKETONE PROPERTIES FOR TOYS

Properties	Unit	POKETONE M410	POKETONE M330	POKETONE M630
Density	-	1.24	1.24	1.24
Melt Index	g/10min	35	60	6
Tensile Strength	MPa	45	60	58
Elongation at Break	%	300	> 240	> 240
Flexural Strength	MPa	45	57	53
Flexural Modulus	MPa	1,050	1,500	1,350
Impact Strength	KJ/m ²	9	8	17

POKETONE is safe material for Toys!

► EN71-3, EN71-9 Toys certification through SGS
(POKETONE is satisfied with a variety of chemical safety requirements)

SGS EN71-3 Certificate

SGS

Test Report

No. F690101/LF-CTSAYHA22-12416

Issued Date: 2022. 08. 05

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HYOSUNG CHEMICAL CORPORATION

235, Banpo-daero

Seocho-gu, Seoul

Korea

The following sample(s) was/were submitted and identified by/on behalf of the client as:-

SGS File No.	: AYHA22-12416
Sample Description	: POKETONE F
Client Reference Data	: M330F, M330F-S, M630F, M630F-S, M730F, M930F, M410F, M410F-S, M710F, M640F, M630F
Style no./Item no.	: -
Order No.	: -
Buyer	: -
Manufacturer	: Hyosung Chemical Corporation
Country of Origin	: Korea
Country of Destination	: -
Received Date	: 2022. 07. 29
Test Period	: 2022. 07. 29 to 2022. 08. 05
Test Result(s)	: For further details, please refer to following page (s).
Report Comments	: The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report is not related to Korea Laboratory Accreditation Scheme. The statement of conformity was made on the requested specification or standard. The decision rule would be based on the binary statement (Pass/Fail) according to ILAC-G8-09:2019 guideline 4.2.1 without taking measurement uncertainty into account by applicant's agreement.

Result Summary

Test Requested	Conclusion
Directive 2009/48/EC and its amendment Council Directive (EU) 2017/738, Commission Directive (EU) 2019/1922 - EN71-3:2019 + A1:2021 - Migration of certain elements (All conclusive testing)	PASS

SGS EN71-9 Certificate

SGS

Test Report

No. F690101/LF-CTSAYHA15-11664

Issued Date: 2015. 12. 24

Page 1 of 4

HYOSUNG R&D BUSINESS LABS

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Anyang-si, Gyeonggi-do

Korea

The following sample(s) was/were submitted and identified by/on behalf of the client as:-

SGS File No.	: AYHA15-11664
Sample Description	: M630A
Style no./Item no.	: -
Order No.	: -
Buyer	: -
Manufacturer	: -
Country of Origin	: -
Country of Destination	: -
Received Date	: 2015. 12. 17
Test Period	: 2015. 12. 17 to 2015. 12. 24
Test Method	: For further details, please refer to following page (s)
Test Results	: For further details, please refer to following page (s)

Result Summary

Test Requested	Conclusion
As specified by client, selected parts of the submitted sample(s) with reference to Safety of Toys, EN 71-9:2005+A1:2007 - Organic Chemical Compounds - Requirements. 1) To determine Monomers (Migration) in the submitted samples. 2) To determine Plasticizers (Migration) in the submitted samples. 3) To determine Solvents (Migration) in the submitted samples.	PASS PASS PASS

► McDonal's Toys certification through Intertek

Intertek McDonal's Toys Certificate (Heavy metal test)

intertek

Total Quality. Assured.

SAMPLE DESCRIPTION: One (1) group of submitted sample said to be Hyosung Corporation Polyketone M630A

Sample received date: December 1, 2017
Date of testing started: December 1, 2017
Date of testing ended: December 7, 2017

TEST CONDUCTED:
AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

CONCLUSION:

Tested Samples	Standard	Result
Submitted sample	McDonald's Restricted Substances Standard Revision 9 - Heavy Metal Test	For your information
	McDonald's Restricted Substances Standard Revision 9 for Monomers Requirement - Total Bisphenol - A Content	Pass

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TOTAL 3 PAGES

CERTIFICATION



All F grades of POKETONE comply with FDA, EN71, PAHS and a variety of certifications. They guarantee chemical safety of POKETONE.

· POKETONE commercial Plant in South Korea, Ul-san City, Production capacity : 50,000 MT/Year



· Excellent Wear Resistance · Low Noise · Low abrasion loss (no particle) · Excellent chemical resistance

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Further Information
www.poketone.com

POKETONE
HYOSUNG POLYKETONE

+Note : The data contained in this publication are based on our current internal knowledge and experience, these do not imply any guarantee of certain properties. Most images are from googling image researching, which is considered as public open information.