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**Harima Develops World's First
High Molecular Weight, Amphoteric PAM-based Paper Strengthening Agent
Certified by FDA, BfR and GB9685**

HARIMA CHEMICALS GROUP, INC.

Harima is glad to announce development of an innovative paper strengthening agent compliant with the United States' FDA, Germany's BfR and China's GB9685 regulations for food packaging materials. "Harmide T2" is the world's first high molecular weight, amphoteric polyacrylamide (PAM)-based paper strengthening agent to be certified by all 3 regulatory bodies as an indirect food additive.

PAM-based paper strengthening agents improve the dry strength of paperboard (in such products as cardboard boxes), printing paper and food wrapping paper. Also, increasing the molecular weight of polymers and optimizing the placement of cationic and anionic groups can boost their properties and facilitate use in a variety of applications. In addition, they play a vital role in environmental protection by enhancing the strength and quality of recycled paper and a multitude of paper options employed in lieu of single-use plastics.

1. Top Features

- Compliant with the world's leading regulations for food packaging materials:
United States' FDA, Germany's BfR and China's GB9685
- Registered as an indirect food additive with FDA's Food Contact Notification Program
- Excellent dry paper strength properties

2. Main Applications

Manufacturing process of paper and paperboard used for food packaging materials that aim for compliance with related world regulations

※Also available as a dry strength improvement agent and retention aid

3. Harima Paper Chemicals

Compliance with World Regulations for Food Packaging Materials

PAM-based paper strengthening agents/Harmide series

- Amphoteric agents in the KS series: FDA and GB9685
- Anionic agents C-10: FDA, BfR and GB9685

Rosin-based sizing agents that improve water resistance

- NeuRoz series (emulsion-based agents CF50 and ES50): FDA, BfR and GB9685
- Harsize series (aqueous agents L-50): FDA, BfR and GB9685

Barrier coatings that improve sealing as well as water and oil repellency

- Highcoat series (agents BC-523 and BC-925): FDA and BfR

Pitch control agents that inhibit pitch deposits which can appear in the papermaking process

- Agents AS-02: FDA and GB9685

Compliance with World Regulations for Food Packaging Materials

Category	Product		World Regulations		
	Name	Code	FDA	BfR	GB9685
PAM-based paper strengthening agents	Harmide	T2 (Amphoteric)	○	○	○
		KS (Amphoteric)	○	-	○
		C-10 (Anionic)	○	○	○
Rosin-based sizing agents	NeuRoz	CF50	○	○	○
		ES50	○	○	○
	Harsize	L-50	○	○	○
Barrier coatings	Highcoat	BC-523	○	○	-
		BC-925	○	○	-
Pitch control agents	AS-02		○	-	○

Harima will continue to promote development of high-quality paper chemicals compliant with the latest regulations and further build presence in world markets.

4. Reference Data

- **PAM (polyacrylamides)**

Polyacrylamides are water-soluble synthetic polymers mainly used in papermaking as dry strength agents, in wastewater treatment as flocculants or coagulants and in crude oil extraction to enhance tertiary recovery. They are also widely employed in textile auxiliaries, laundry glue, adhesives (synthetic glues) and paints.

- **FDA (Food and Drug Administration)**

The United States' FDA has strict safety requirements that are considered the global standard. New substances not on its positive list must be registered with the Food Contact Notification (FCN) program as an indirect food additive.

- **BfR (The German Federal Institute for Risk Assessment)**

Food packaging materials and products exported to the European Union (EU) must comply not only with EU regulations but also with the regulations of each member state. The BfR certification attests that the product complies with Germany's food packaging standards.

- **GB9685**

GB9685 is one of China's safety standards for food contact materials. New substances not on the positive list of "Hygienic Standards for Use of Additives in Food Containers and Packaging Materials" are subject to technical review by the CFSA (China National Center for Food Safety Risk Assessment).

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