

PRODUCING BETTER QUALITY RICE FLOUR AT A LOWER COST



BY
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KATSUHIKO SASAKO

NEW PATENTED PROCESS

PATENT USA 9,693,581 B2

PATENT PENDING IN EUROPE CURRENTLY

➡ **DEVELOPED BY MR. K. SASAKO**

NEW PROCESS PROVIDES

- ➡ **BETTER QUALITY**
- ➡ **IS COST EFFECTIVE**
- ➡ **BETTER FOR THE ENVIROMENT**
- ➡ **BETTER NUTRIENT VALUES**

What is Good Rice Flour?

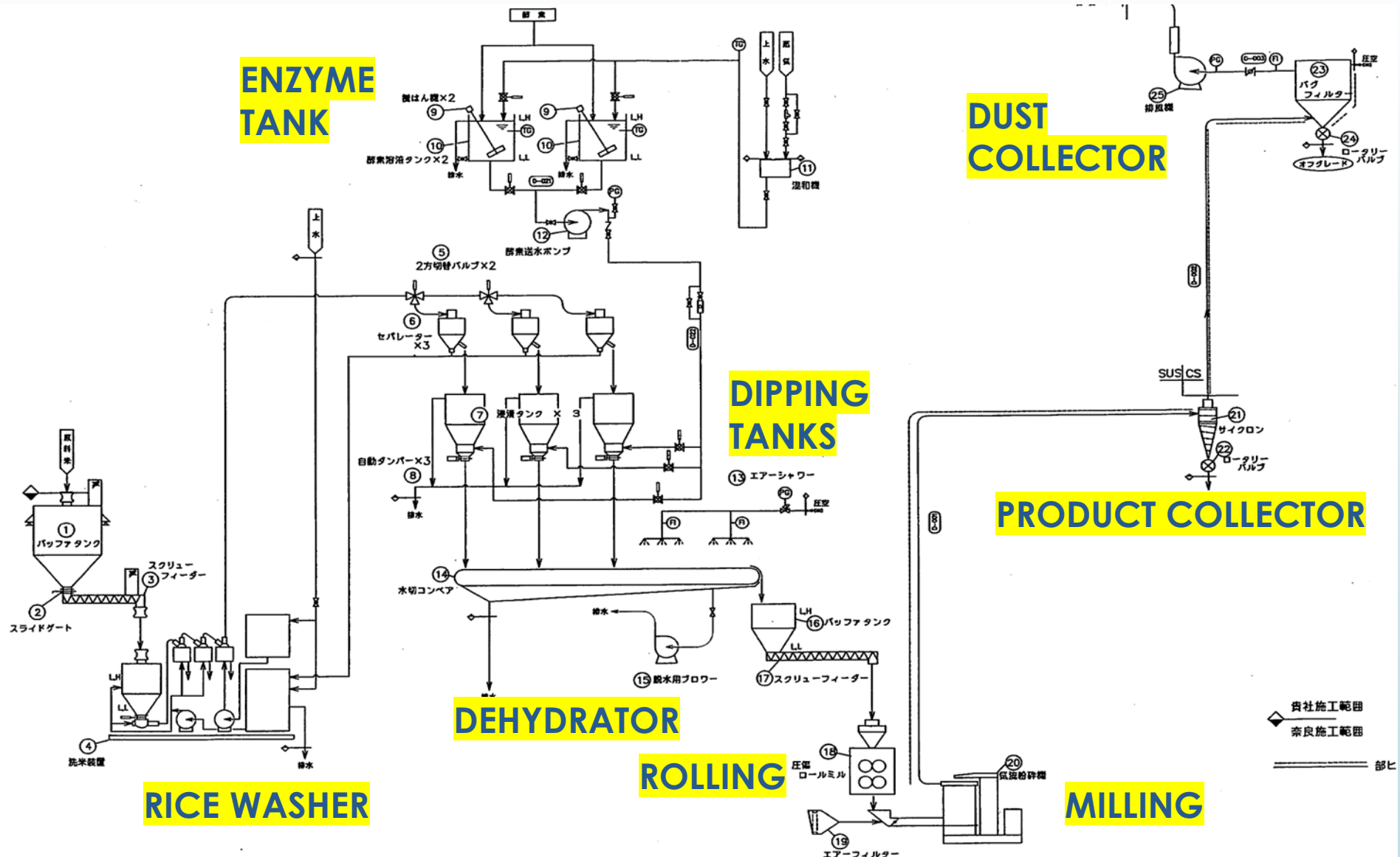
- **AMYLOSE PERCENTAGE**
 - 1. 25% OR ABOVE NEEDED FOR MOIST CAKES OR SOUP NOODLES
 - 2. 15%-25% FOR BREADS
 - 3. Under 15% FOR SPONGY CAKES
- **OPTIMAL FACTOR IN COMMON**
 - 1. SHOULD CONTAIN LESS THAN 80% of PARTICLE SIZE 75 μ m
 - 2. STARCH RATIO SHOULD BE BELOW 12% DEPENDING ON RICE FLOUR PROPORTION
 - 3. SHOULD KEEP MOISTURE CONTENT BELOW 15%.

MAKING RICE FLOUR

► TRADITIONAL **ENZYME** PROCESS METHODOLOGY

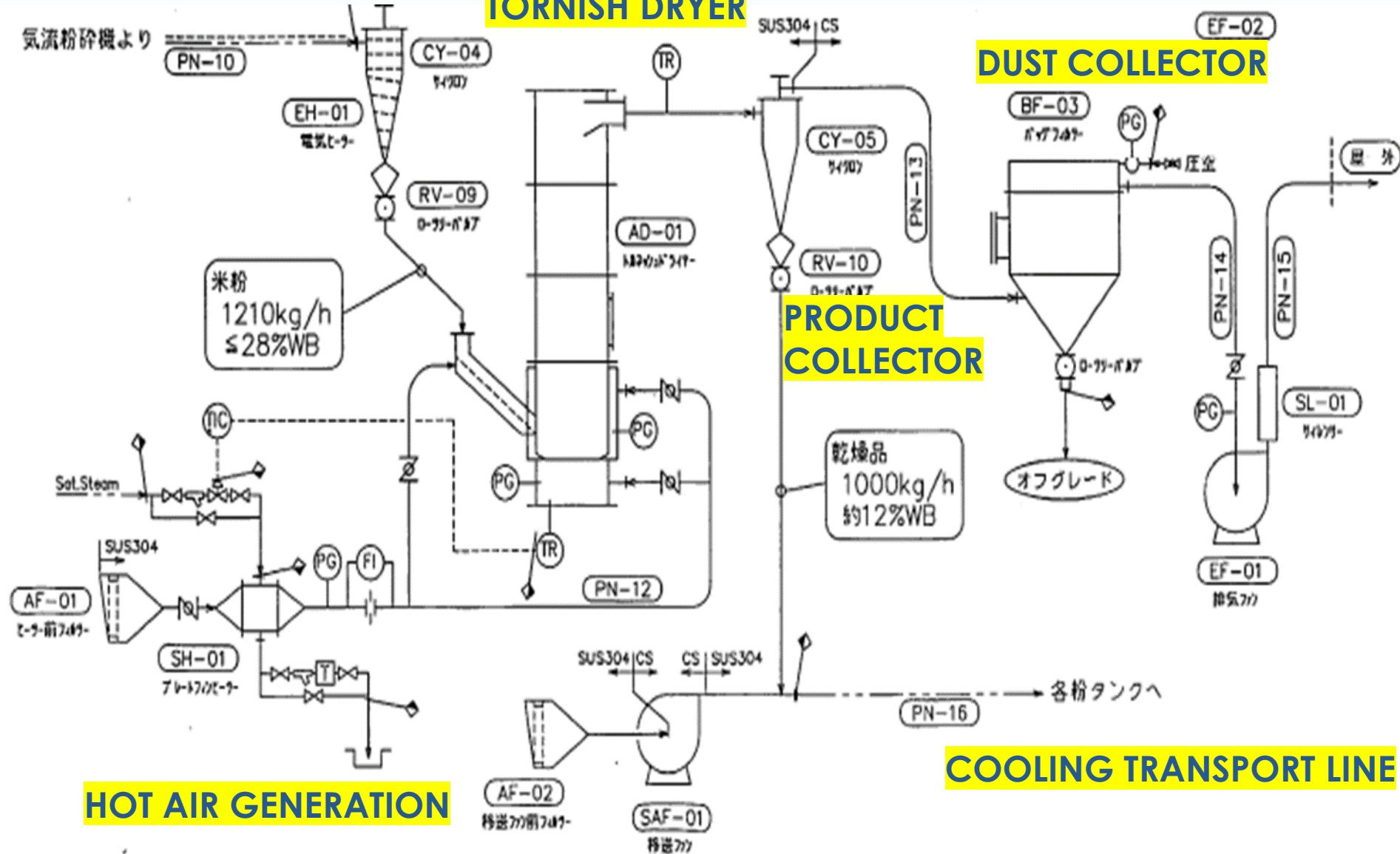
1. RAW RICE DISPENSING AND WASHING
2. ENZYME SOAKING DEHYDRATION
3. MILLING
4. DRYING
5. VIBRATION SIEVING
6. WEIGHING AND PACKAGING

ENZYME PROCESS



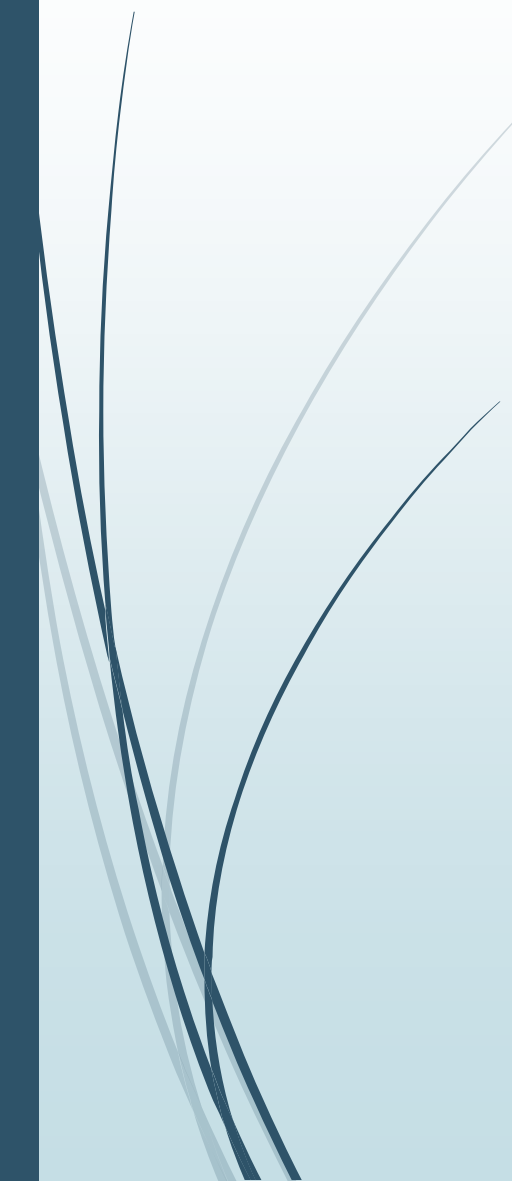
Drying

TORNISH DRYER

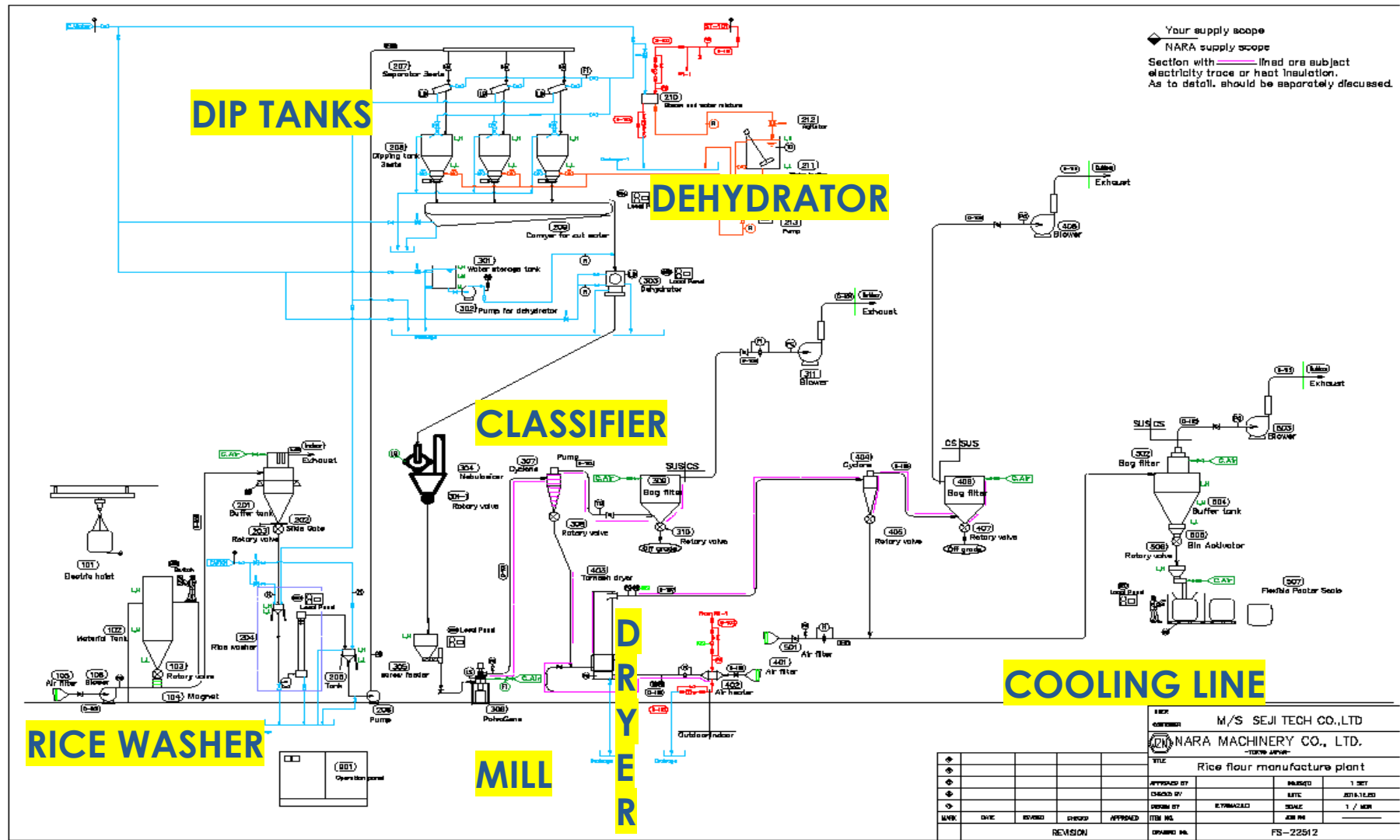




NEW RICE FLOUR PATENTED PROCESS

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1. RAW RICE DISPENSING AND WASHING
 2. SOAKING
 3. DEWATERING
 4. MILLING
 5. DRYING
 6. CLASSIFYING
 7. WEIGHING AND PACKAGING

New Rice Flour Patented Process



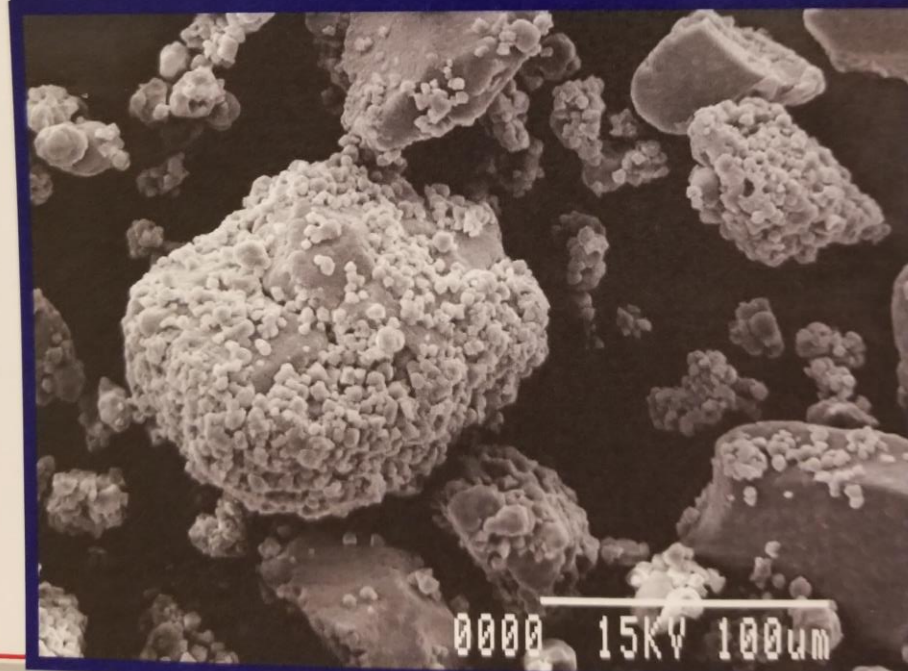
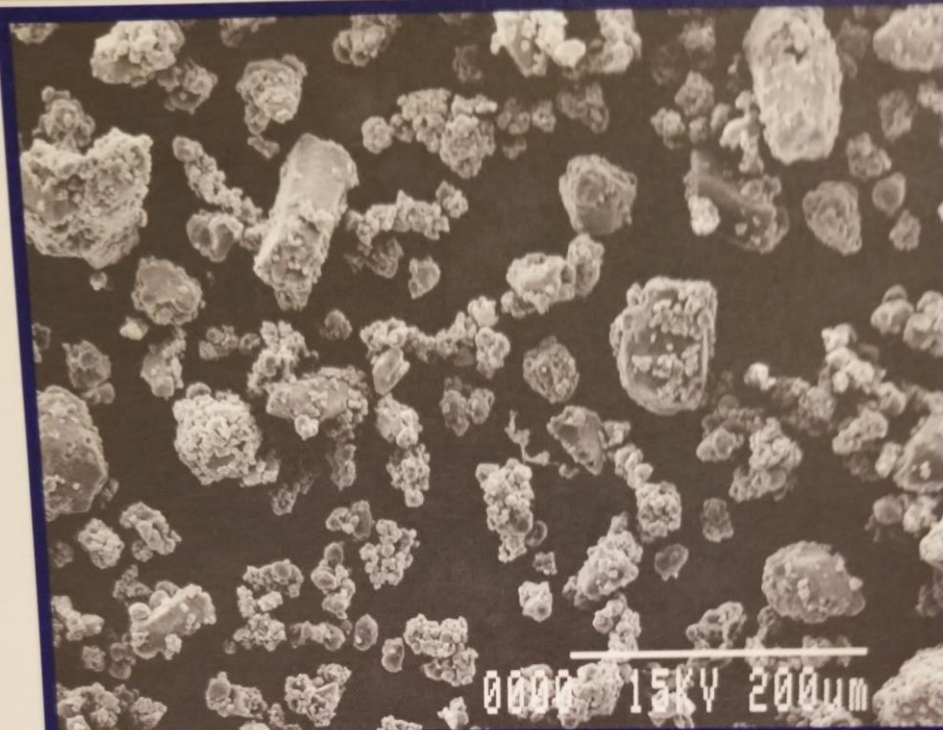
NEW PATENTED RICE FLOUR PROCESS

ADVANTAGES

- **NO ENZYME (Cost saving)**
- **DIPPING DOES NOT REQUIRE HOT WATER.
(UTILITY SAVINGS)**
- **BETTER PARTICLE SIZE DISTRIBUTION**
- **DRYING TIME LESS DUE TO RESIDENCY TIME IN
DRYER**
- **SMALLER PROCESS FOOTPRINT**

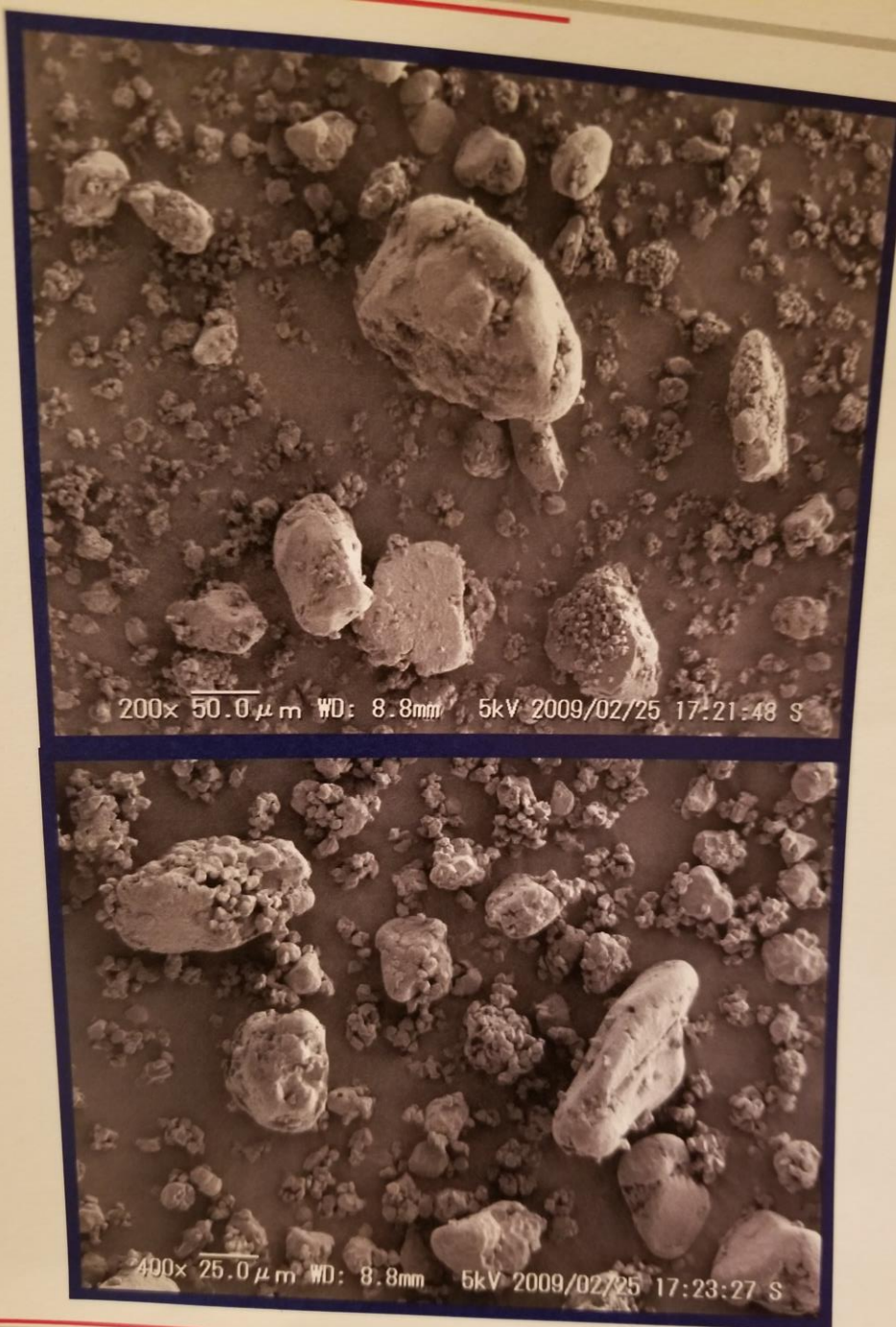
PARTICLE DISTRIBUTION ENZYME


SIEVE OPENING	SIEVE OPENING	REMAINS ON SEIVE (%)	ACCUMULATED REMAINS ON SIEVE (%)
300 µm	48 MESH	0.1	0.1
150 µm	100 MESH	1.9	2.0
160 µm	145 MESH	11.1	13.1
75 µm	200 MESH	8.2	21.3
53 µm	280 MESH	22.2	43.5
PAN RESIDUE		56.5	100.00




CLASSIFIER AND MILL

PROPERTY VALUE			
ITEM MEASURED		VALUE	
200 MESH PASS RATIO		88.4%	
BULK DENSITY		473kg/m ³	
MOISTURE CONTENT		13.0% WB	
		PARTICLE	DISTRIBUTION
SIEVE OPENING		REMAINS ON SIEVE (%)	ACCUMULATED REMAINS OF SIEVE (%)
106µm	145 mesh	3.7	3.7
75µm	200 mesh	7.9	11.6
53µm	280 mesh	11.6	22.8
PAN		77.2	100.0






	Starch Damage (%) (AACC method)	Operation Condition
Company A, Enzyme process Pneumatic Mill + Flash Dryer	3.3	Inlet gas temp. = 120°C Outlet gas temp. = 60°C
Company B, Double grind process Pneumatic Mill + Flash Dryer	4.0	Inlet gas temp. = 120°C Outlet gas temp. = 60°C
Air Milling + Tornesh Dryer	2.8	Inlet gas temp. = 100°C Outlet gas temp. = 60°C
Polvo Gene + Tornesh Dryer	2.0	5,740min ⁻¹ Inlet gas temp. = 100°C Outlet gas temp. = 51°C



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		Company N Factory 1	Company N Factory 2	Company D (Korea)	NARA	Wheat Flour Plant
	Machine	<ul style="list-style-type: none"> ▪ Wet Washing ▪ Enzyme/ Double Roll ▪ Air Impact Mill ▪ Flash Dryer 	<ul style="list-style-type: none"> ▪ Wet Washing ▪ Enzyme/ Double Roll ▪ Air Impact Mill ▪ Tornesh Dryer 	<ul style="list-style-type: none"> ▪ Pre-dry Washing ▪ Enzyme/ Double Roll ▪ Air Impact Mill ▪ Tornesh Dryer 	<ul style="list-style-type: none"> ▪ Dry Washing ▪ Nebulasizer ▪ Polvo Gene ▪ Tornesh Dryer 	<ul style="list-style-type: none"> ▪ Moisturizing ▪ Grinding (x 12) ▪ Sieving (x 10) ▪ Refinery
	Water Usage (Rice: Water)	1 : 4	1 : 4	1 : 2	1 : 1	1 : 0.1
	Cost for Water Treatment	\$900,000	\$900,000	\$540,000	\$360,000	—
	Steam Usage (kg/h)	1,300	810	810	730	—
	Material Cost	\$540	\$540	\$540	\$540	\$540
	Process Cost (with Enzyme)	\$540 (\$630)	\$450 (\$540)	\$432 (\$522)	\$405 (\$405)	\$450
	Wholesale Price /1,000kg (with Enzyme)	\$1,080 (\$1,170)	\$990 (\$1,080)	\$972 (\$1,062)	\$945 (\$945)	\$990

SUMMARY

MORE EFFICIENT PROCESSES
CAN PROVIDE BETTER FLOUR
AND SAVE MONEY AND
UTILITIES.

BY

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NARA MACHINERY LTD



QUESTIONS ?