ATMO ASIA sphere
technology & innovation
natural refrigerants
3-5 February 2014, Tokyo

Industrial Refrigeration System using NH_3/CO_2 Refrigerant "*NewTon*"

- For Cold Storage in Japan and Others -

Feb. 2014
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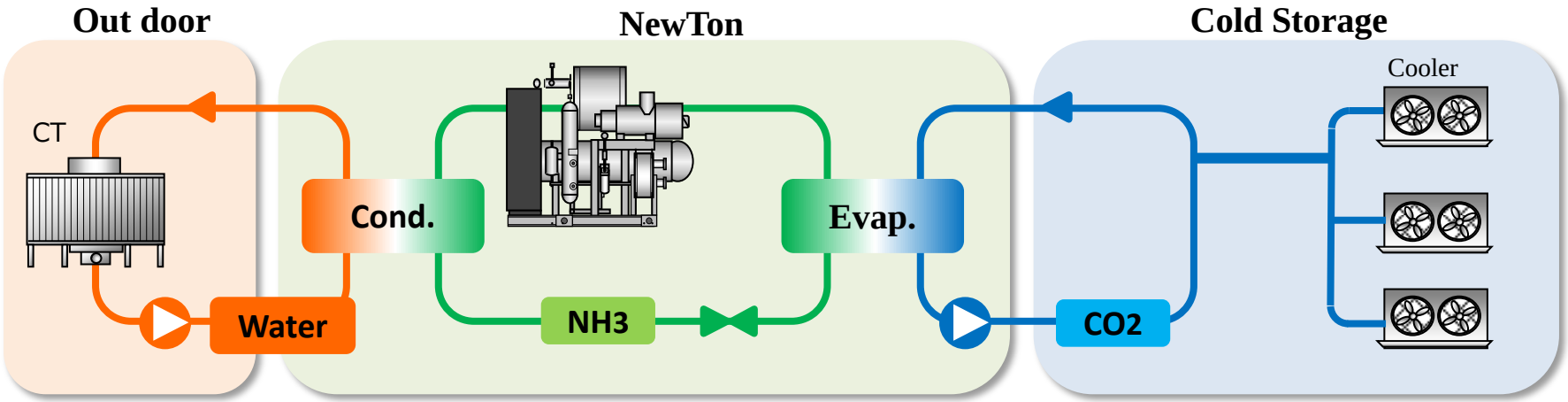
Mayekawa Mfg.Co.,Ltd.
MYCOM JAPAN

Basic Concept of *NewTon*



Water cooled

- Energy saving
- NH3 charge min.
- Free layout
- Easy Maintenance

NH3 Package

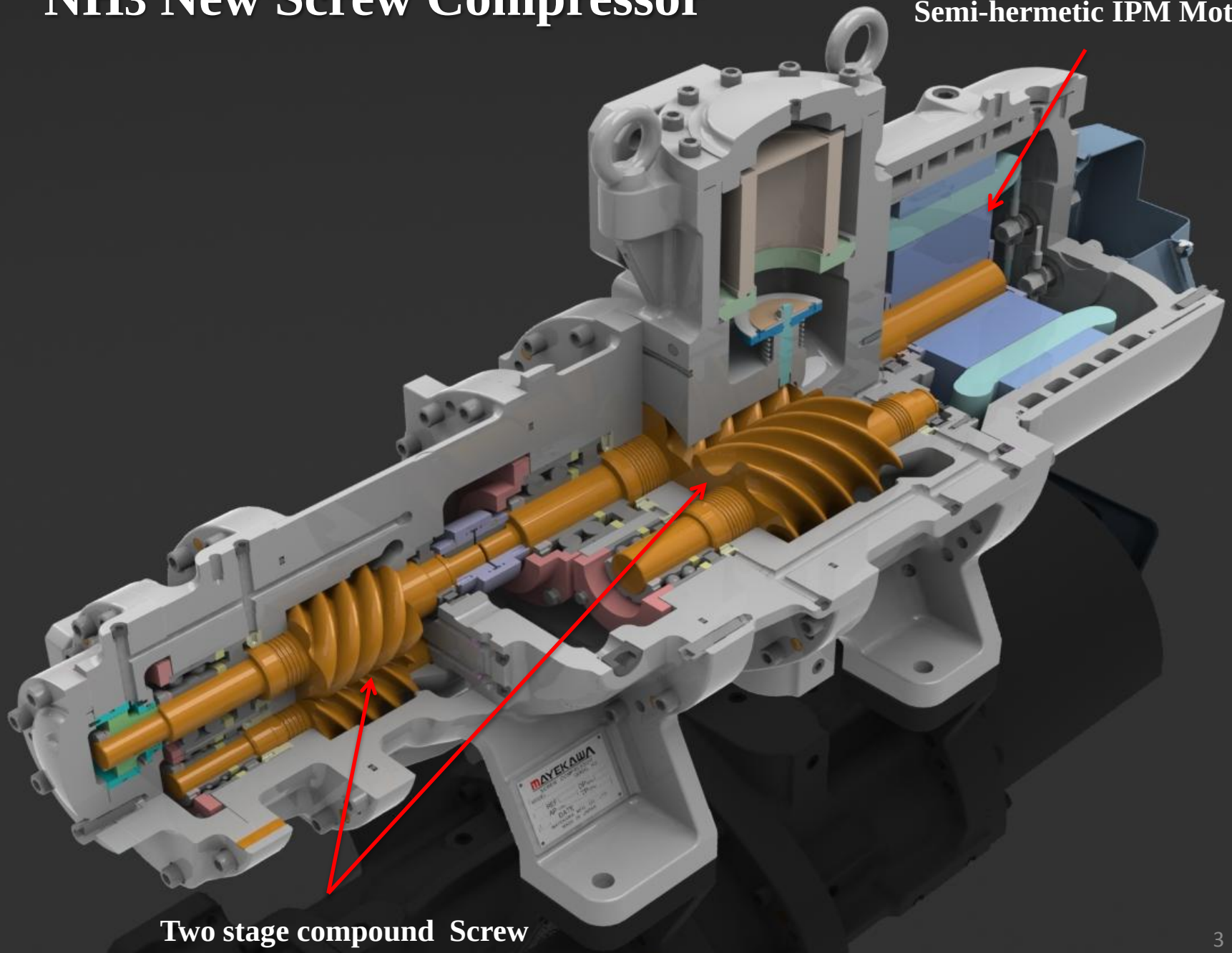
- New Screw compressor
- Semi-hermetic IPM motor
- Flooded Evaporator
- Double economizer
- Automatic operation

CO2 brine

- Safety
- Low pump power
- No trouble by oil
- High heat transfer

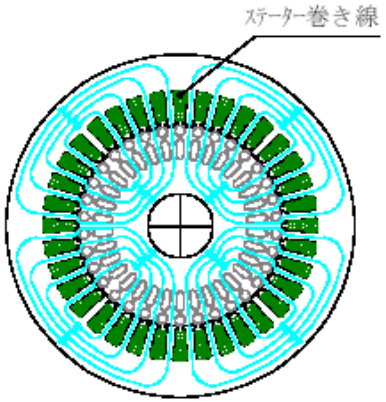
「Safety」「Energy saving」「Easy maintenance」

NH3 New Screw Compressor

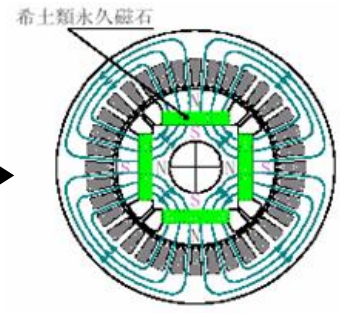


High Efficiency Motor（IPM motor）

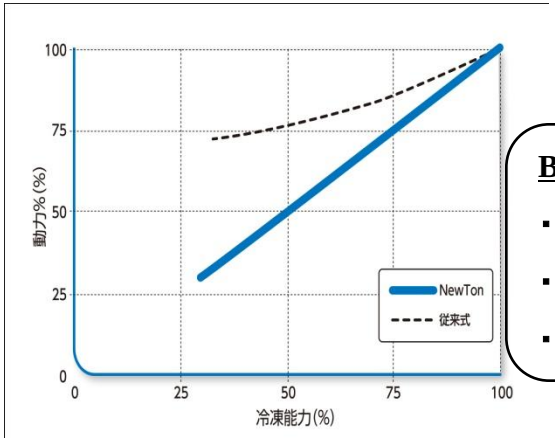
- Semi-Hermetic for NH3 -



Conventional

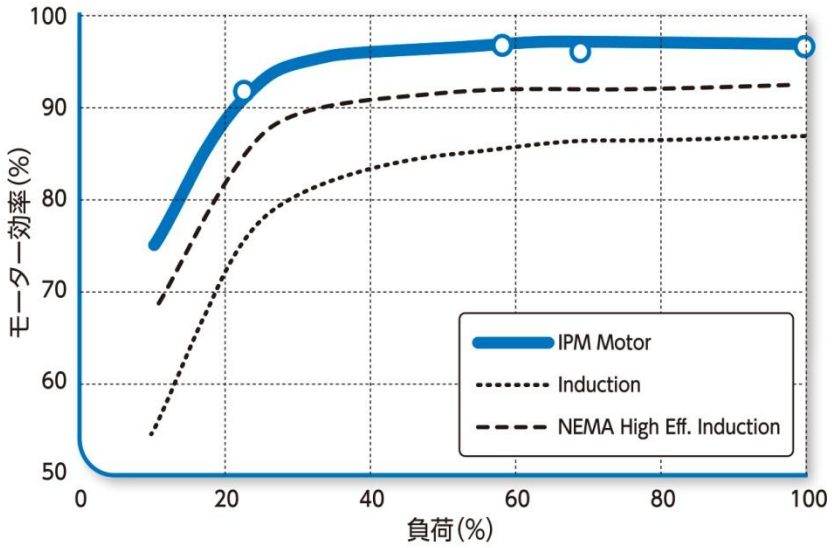


IPM motor

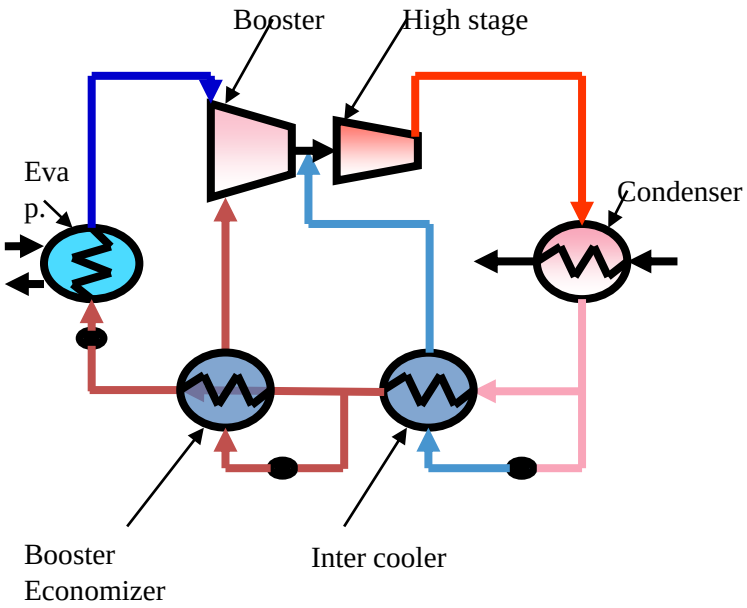


Benefits of IPM motor

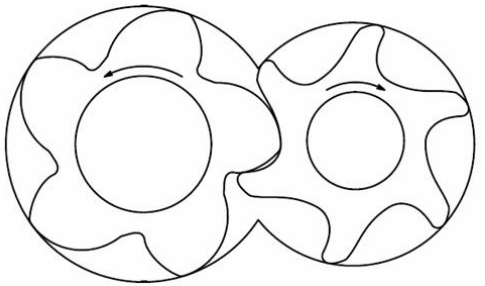
- 5～10% better in efficiency
- 40% smaller in size
- High speed is possible



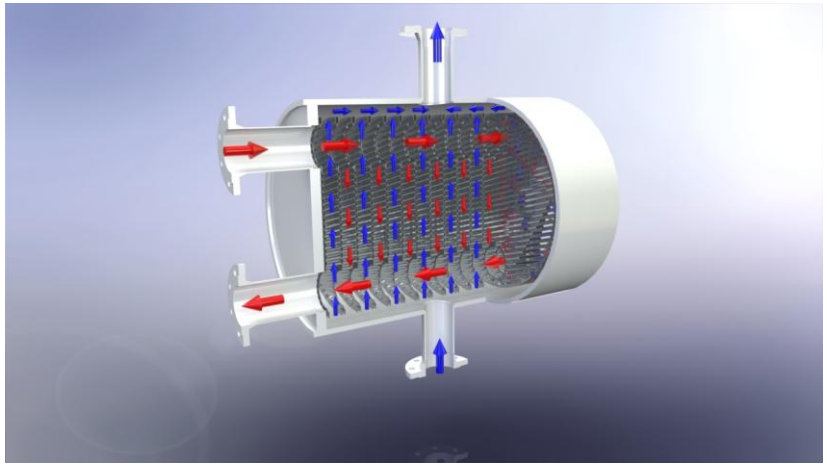
New rotor profile and Double economizer system etc

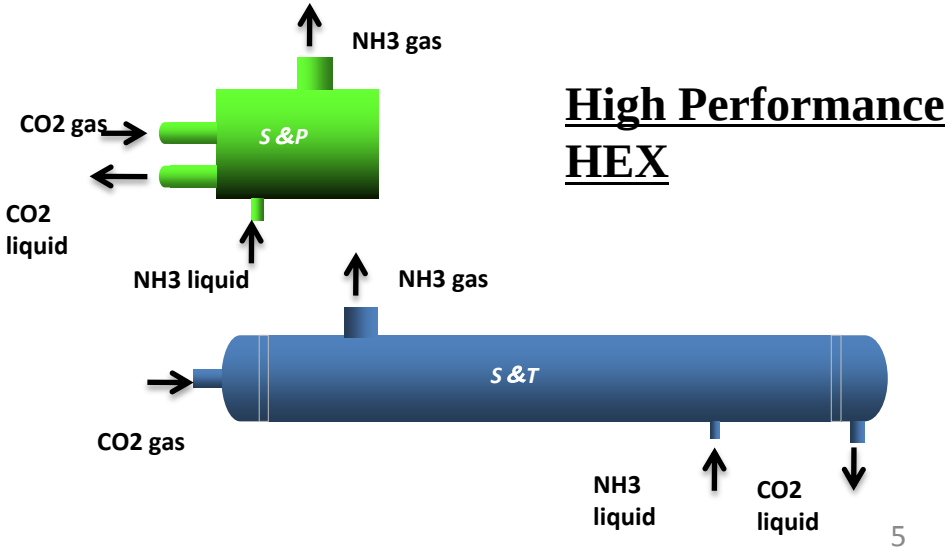


Double Economizer



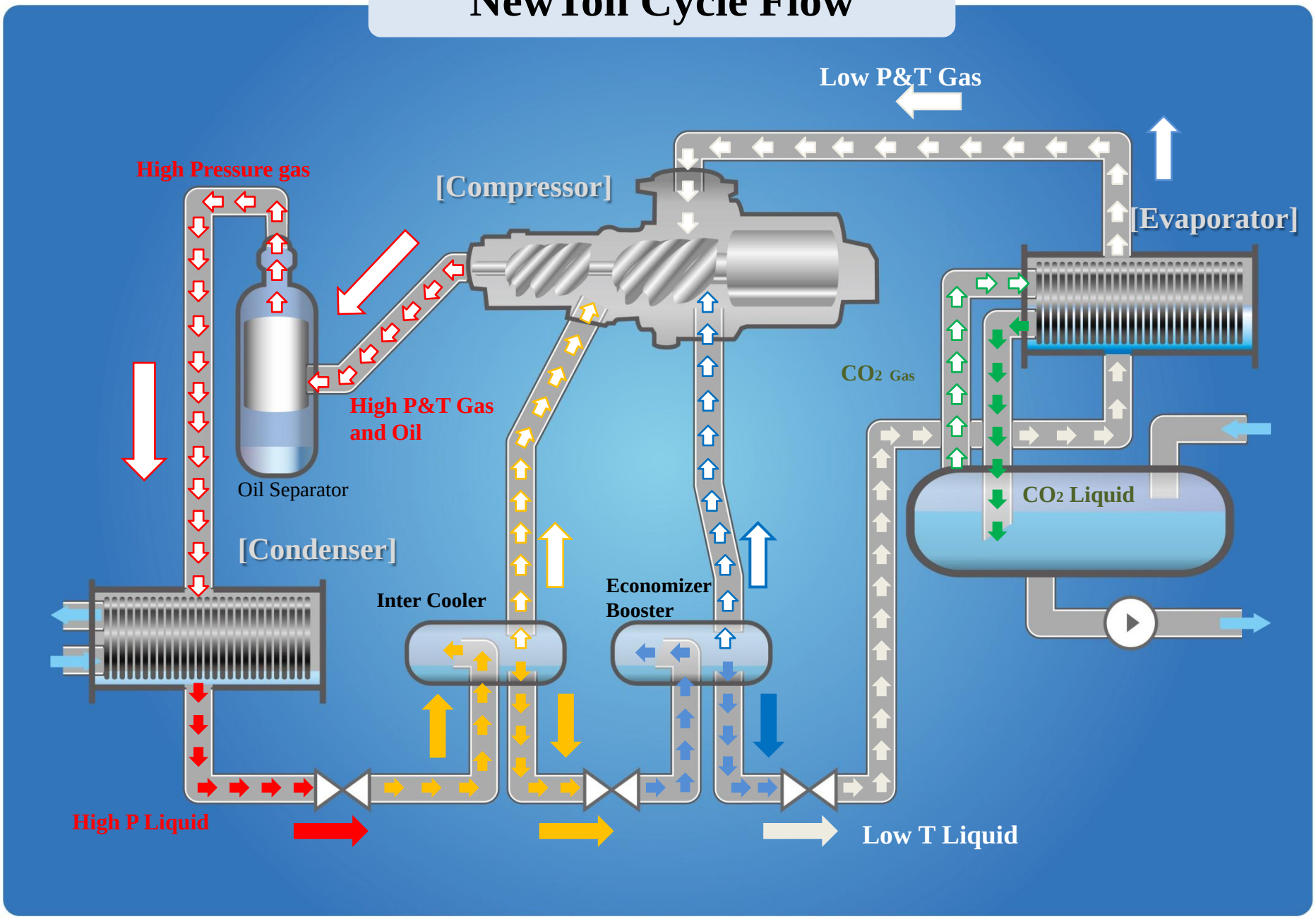
New Rotor-Profile





High Performance HEX

NewTon Cycle Flow



Main Installations of *NewTon*

Customer	Volume (m3)	Newton sets	installed
Nissui Logistics / Kawasaki	35,000	3	2008
Toyo Suisan / Nagoya	80,000	9	2009
Hosui / Atsugi	20,000	2	2010
Yokohama Reito / Osaka	68,000	8	2011
Coop / Onomichi	75,000	8	2012
Matsuoka / Kawasaki	200,000	11	2012
Nichirei Logi. / Kawasaki (for one floor)	100,000	1	2013
Maruha-Nichiro Logi. / Kawasaki	75,000	6	2014

500 are running

Nissui Log. ／Kawasaki

Toyo Suisan / Nagoya


Yokohama Reito / Osaka


Coop ／ Onomichi

Matsuoka/Kawasaki

Nichirei / Kawasaki

Maruha Nichiro /Kawasaki

Case 1 “Cold Storage” of 200,000m3

Address 88 Higashi-ogijima, Kawasaki ward, Kawasaki city

Total ground 33,742m2

Building space 15,958m2

Floor space 53,910m2

Characteristics

LED Lighting

Truck Yard x 70 units (with air shelters)

Vertical Lifters x 13 units, Elevators x 3 units

Refrigeration system operating with natural refrigerants (a subsidy by the Ministry of Environment)

Case 1 Cold Storage (-25℃) and Loading room (0 ℃)

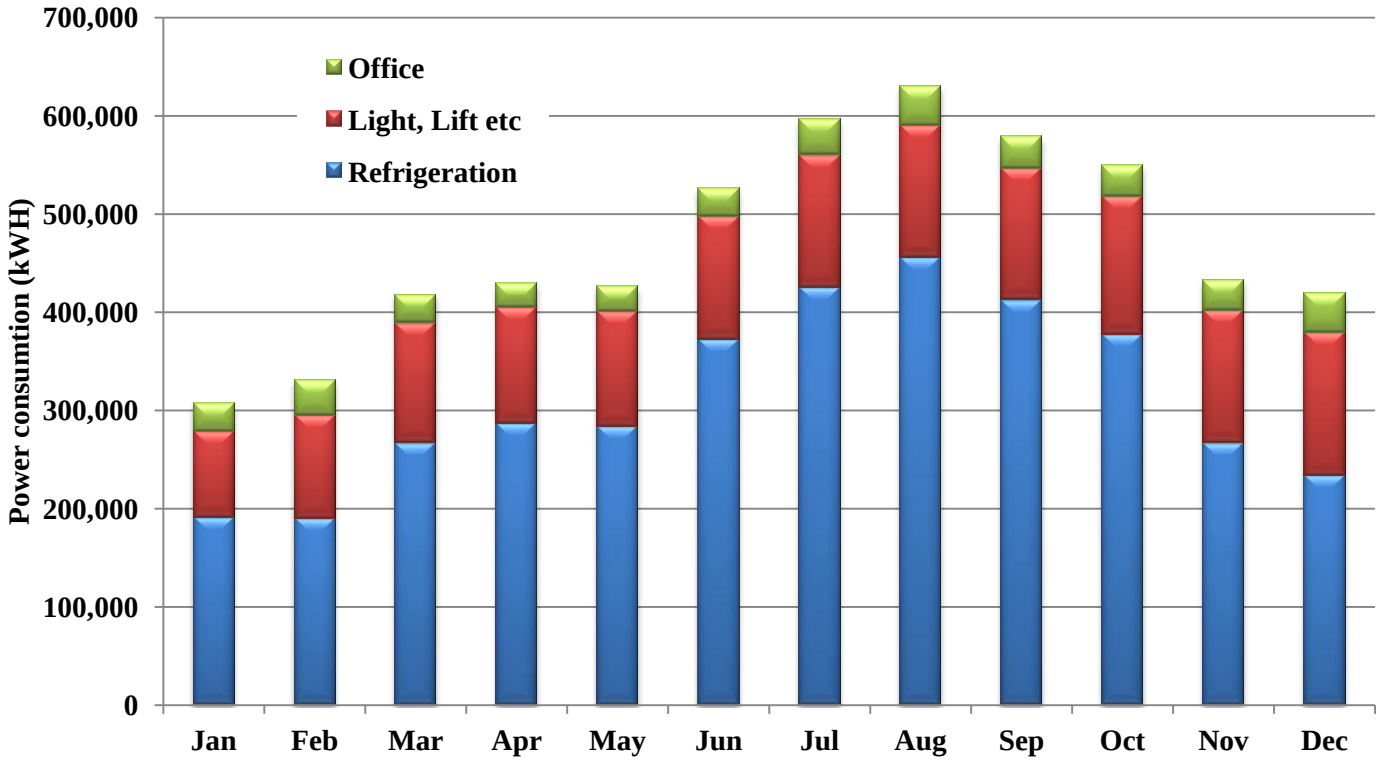
NewTon R-8000 ×5 sets

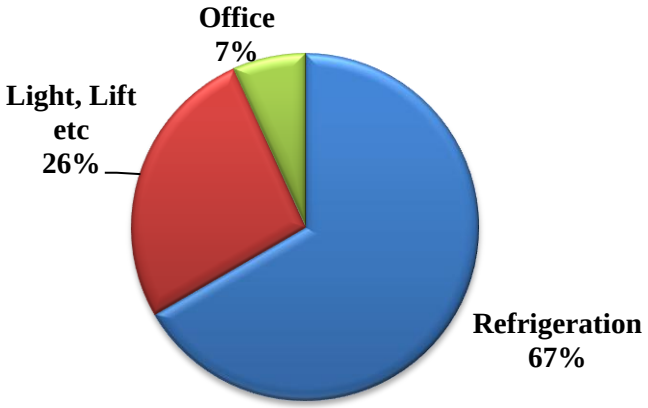
NH3 Charge 70kg / unit Total 350kg

NewTon C ×4 units

NH3 Charge 60kg / unit Total 240kg

Case 1 Power consumption data (2013)

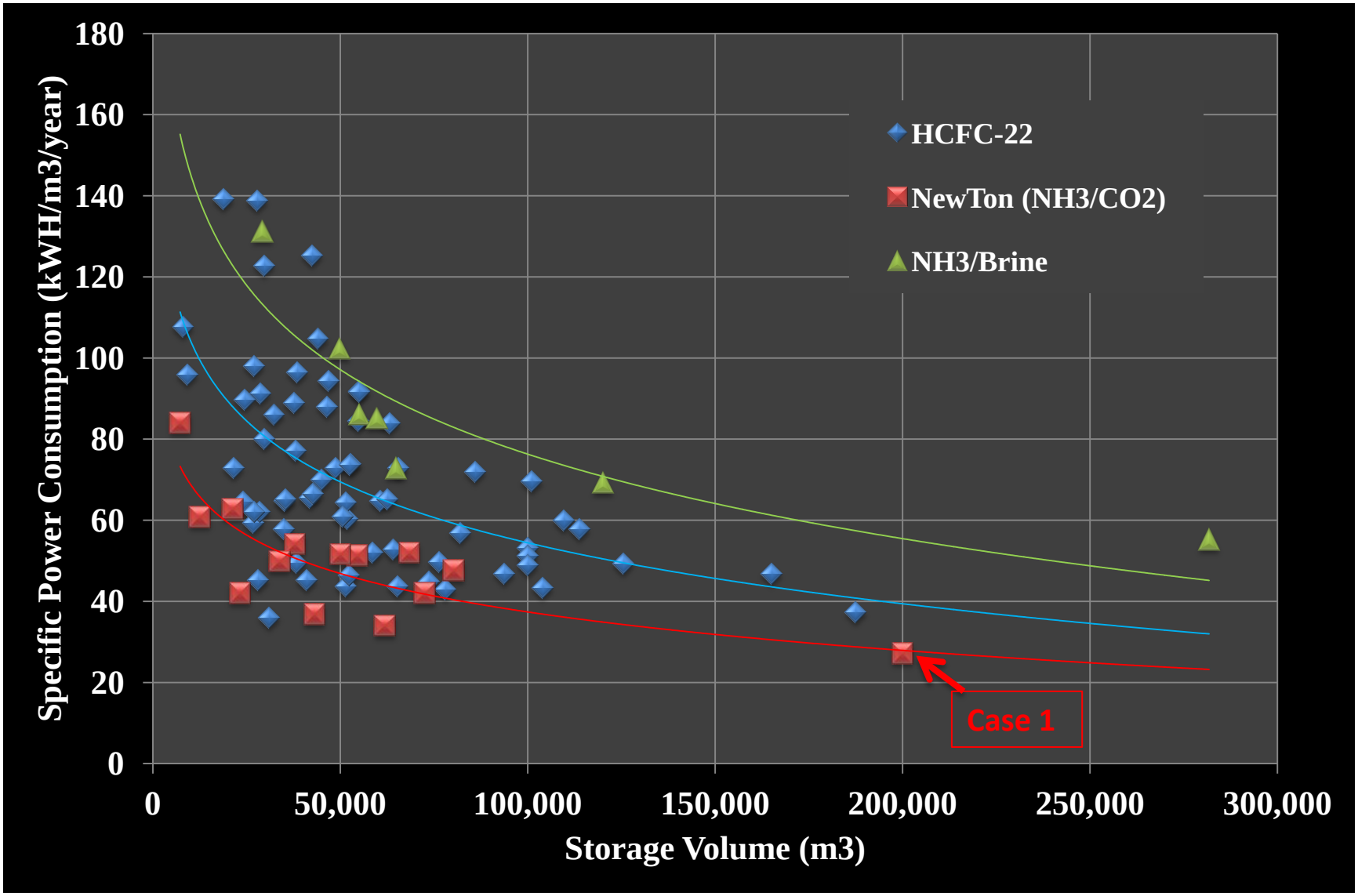




Specific Power Consumption (kWH/m3/year)

Refrigeration	18.8
Light, Lift etc	7.9
Office	1.9
Total	28.2

Specific Power Consumption in Cold Storage



Case 2　Renewal of Cold Storage

Tokyo Toyomi Reizo / Hunabashi

Storage Volume ：45,000 m3

Previous

Refrigerant ：HCFC-22

Machine ：F1610C−8sets

System ：Dry Expansion

8sets of NewTon3000 replaced.

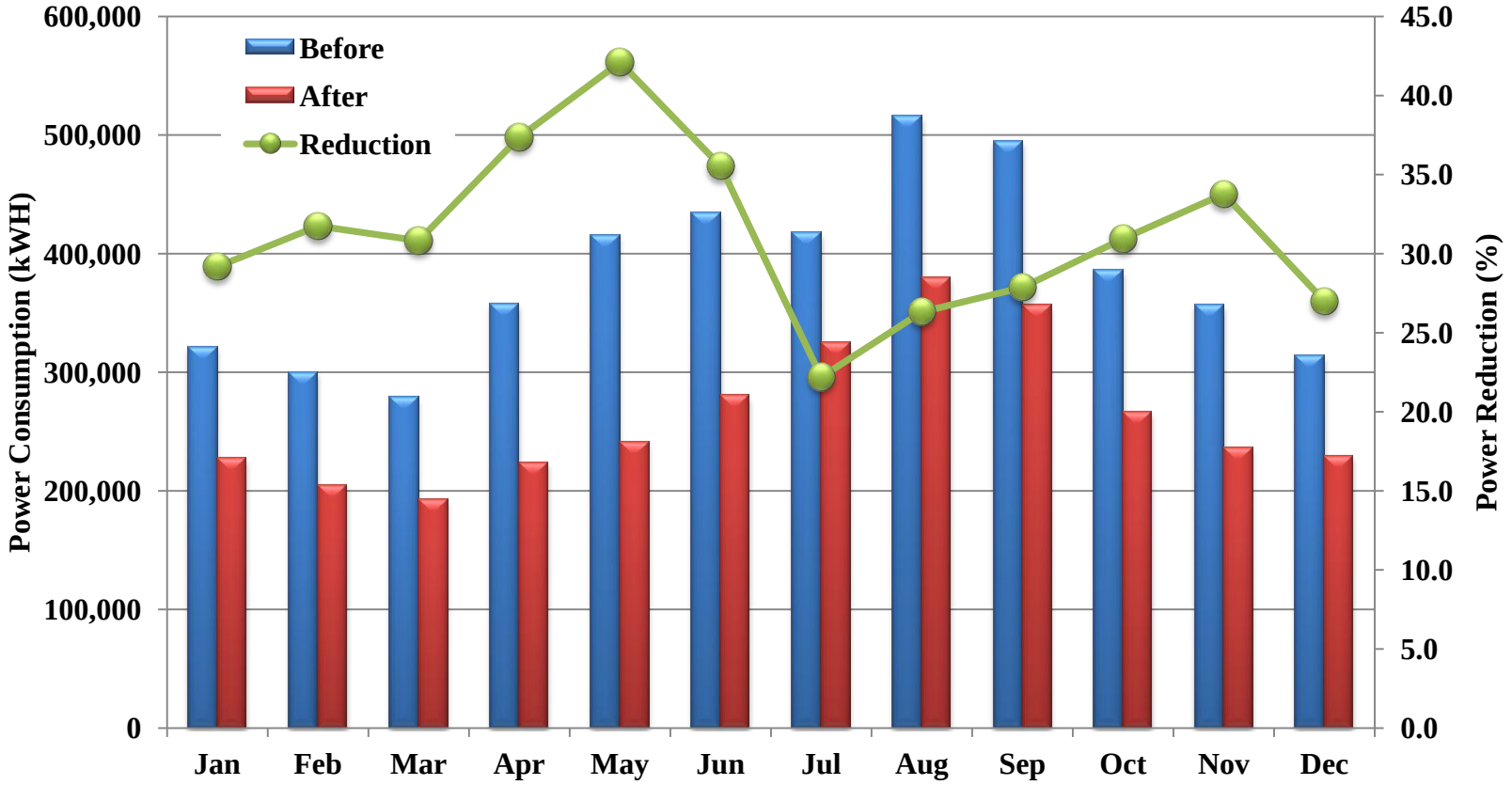
4sets in 2008

4sets in 2009

Case 2 Power consumption reduction

Tokyo Toyomi Reizo / Hunabashi

(average -31.1%)



* Based the bill of Tokyo Power Co.

* Total Power consumption, incl carriers, lights, office machines, etc.

Power reduction through renewal with NewTon

Customer	Volume	Age	Previous Refrigerant		Power reduction
	(m3)	(year)	Refrig.	Comp.	(%)
Tokyo Toyomi (Case 2)	**45,000**	**29**	**HCFC-22**	**Screw**	**31.1**
Niigata Reizo	10,000	33	HCFC-22	Recip.	41.2
QP “Kewpie”	16,250	27	HCFC-22	Recip.	24.9
Sensui Reizo	6,125	38	HCFC-22	Screw	29.3
Ajinomoto	7,500	25	HCFC-22	Recip.	28.0
Gliko	30,000	30	HCFC-22	Screw	19.8
Showa Reizo	32,500	22	HCFC-22	Recip.	28.0
AMB Funabashi	30,000	25	NH3/Brine	Recip.	34.0

"NewTon" for ASEAN

"1st NewTon system" will be installed to P.T. ADIB Global Food Supplies in Indonesia.

P.T. ADIB
A cold storage warehouse nearby Jakarta

Joint Crediting Mechanism — Host Country : Indonesia

JCM Project for Cold Chain Industry in Indonesia with "NewTon"

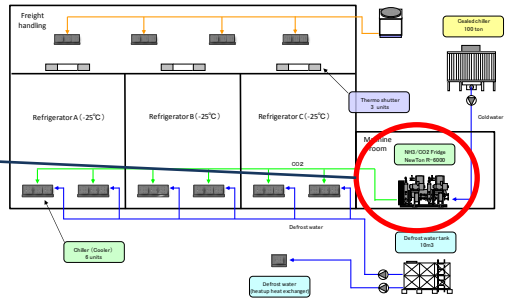
This project was funded by the MOEJ in FY 2013 as the 1st project to Joint Crediting Mechanism .

Most advanced Japanese energy efficient non-fluorocarbon cooling system

Indonesia
On August 26, 2013
(Jakarta)

NewTon R-6000

Entity:
Mayekawa Mfg CO. Ltd



Demonstration Site:
PT.ADIB Global Supplies

Energy Consumption reduction	570,000 kwh /year	Estimated GHG reductions	Without consideration of HFC leakage emissions: 213 (tCO2/year) With consideration of HFC leakage emissions: 902 (tCO2/year)

Energy Efficient Refrigeration Technology

- MOEJ introduce the Energy Efficient Refrigeration Technology of **"NewTon"** as **Japanese Good Practices**.

http://www.env.go.jp/en/earth/ozone/goodpractice/full.pdf

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Thank you very much!