

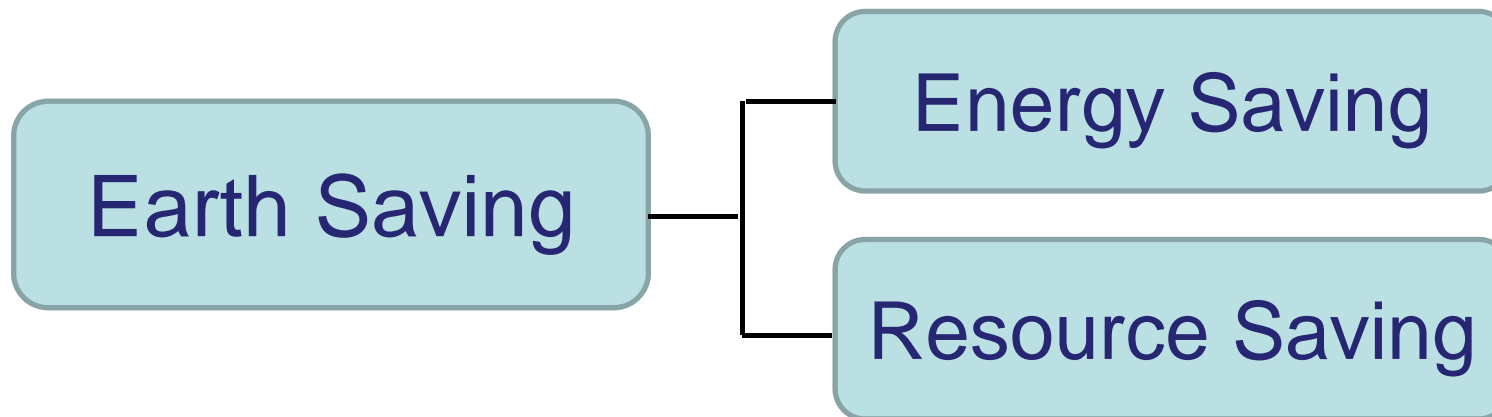
“Eco-Lead Furnace™ ”

High energy efficiency and
Furnace security service

2018 Glassman Aisa in Bangkok, Thailand

AGC AGC CERAMICS CO., LTD.

Group Management Policy



We advocate “Earth Saving” from 2012.

AGCC latest news in glass field

- 2012 Starts “Earth Saving”
- 2015 “THERMOTECT WALL™” got the grand prize for excellent energy solution in Japan.
- 2016 100TH anniversary
40 yeas for engineering business
130 > furnaces
- 2016 “Eco-Lead Furnace™” was put in the market.
- 2017 Starts to supply chromia refractory line-up

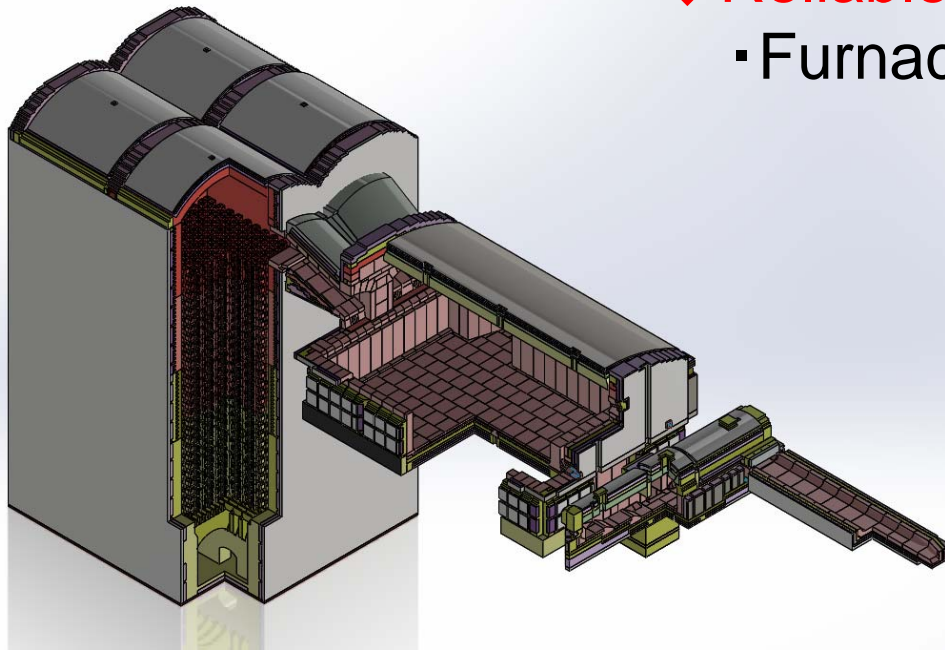
Eco-Lead Furnace™

◆ High energy efficiency

- 4th Generation Hyper Regenerator
- THERMOTECT WALL™

◆ Reliable operational support

- Furnace security service



Hyper Regenerator System

Supply records

Period	1960's	1970's	1980's	1990's	2000's	2010's
Number of Multi-REG	2	5	10	6	7	14
Glass type						
Cullet	2	4	6	1	2	1
Container	0	0	2	4	5	13
Table Ware	0	0	1	0	0	0
Boro-Sil	0	1	1	1	0	0
Purpose						
Save Energy (A)	0	0	3	4	6	14
Checker Trouble (B)	0	0	0	0	0	0
(A)+(B)	2	5	7	2	1	0
Improvement of the technology	1-st Generation(Challenge)					
		2-nd Generation (Solve Problem and Expand)				
					3-rd Generation (Reliability with Simulation)	
						4-th Gen. (with TMT)

*Furnaces in AGC Group and designed by AGCC

Features of THERMOTECT™

■ 1.High thermal resistance

- Applicable over 1600°C

■ 2.High thermal insulation properties

- Equivalent efficiency to conventional insulation brick

■ 3.Low shrinkage

- Linear shrinkage after heating at 1600°C hardly changes

■ 4.Easy on-site installation

- Monolithic materials either castable or Pre-cast block

■ 5.Human body-friendly

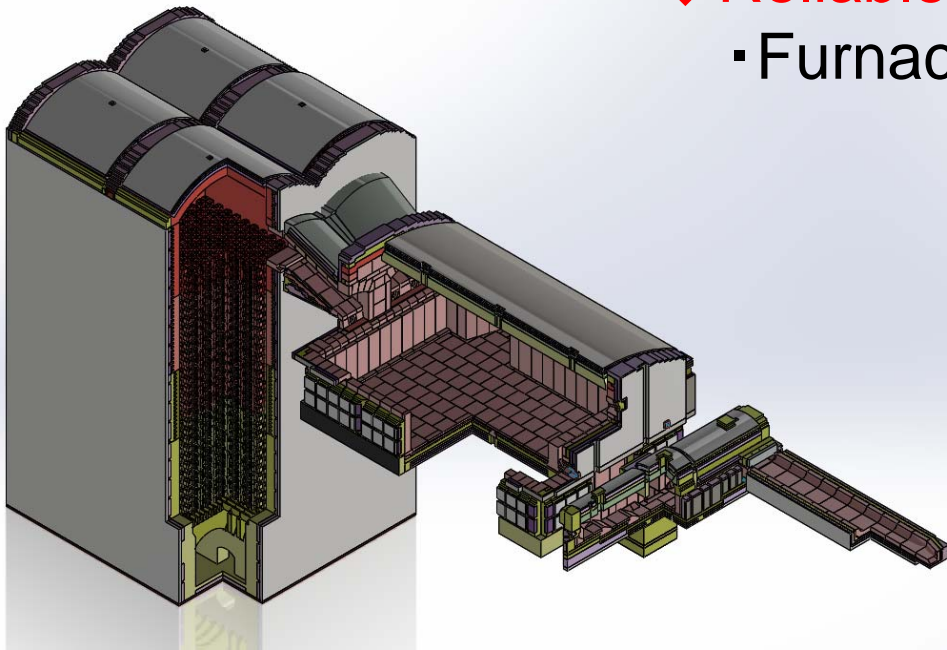
- Non Refractory Ceramic Fiber (RCF)



Eco-Lead Furnace™

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 - 4th Generation Hyper Regenerator
 - THERMOTECT WALL™

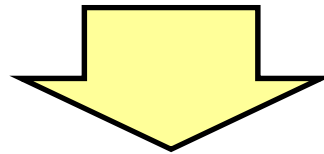
- ◆ Reliable operational support
 - Furnace security service



To achieve furnace stable operation and long life

Similar to human health

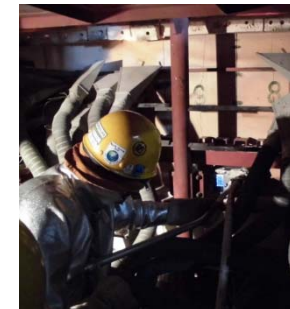
- Continuous health care (ex:weight trend management)
- Regular medical examination



Furnace security service by AGCC

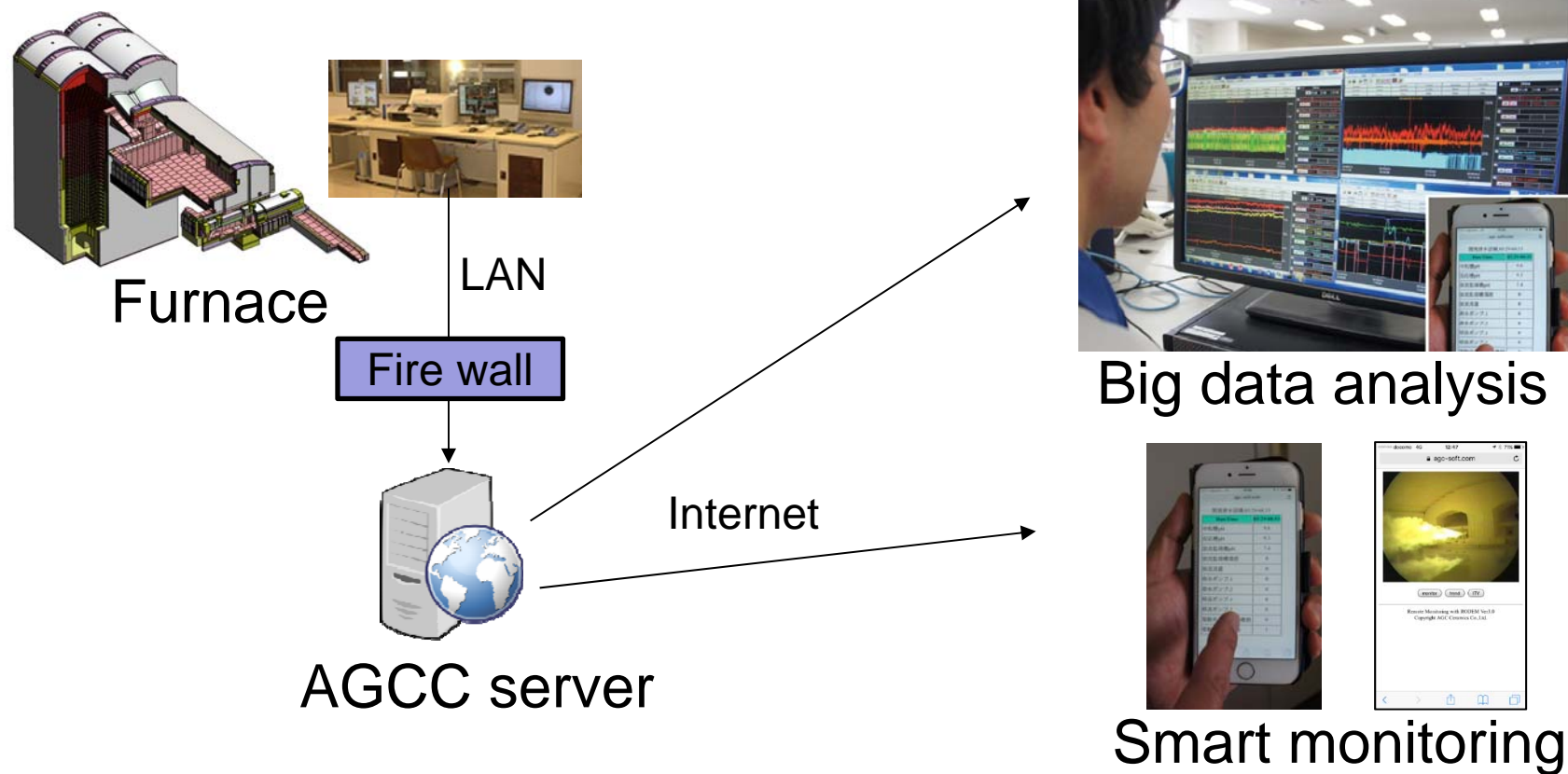


Remote monitoring by AGCC



Periodical check onsite

Remote monitoring system

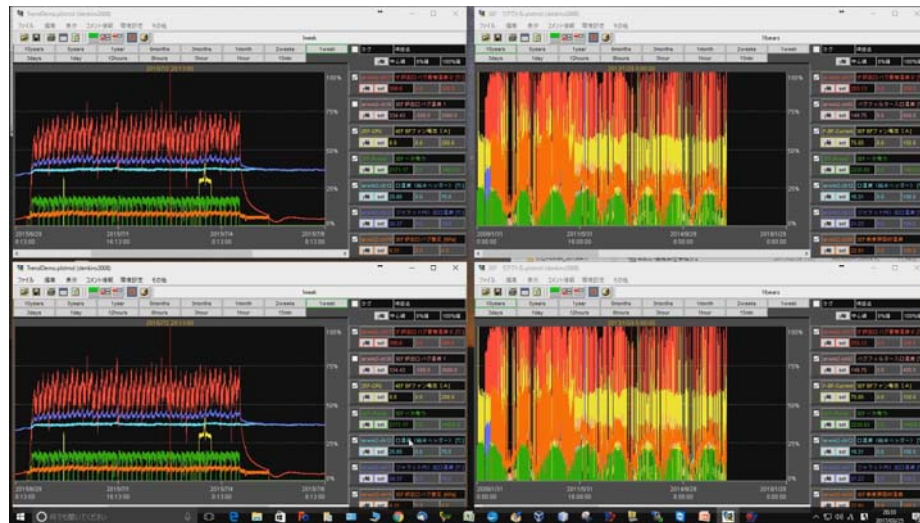
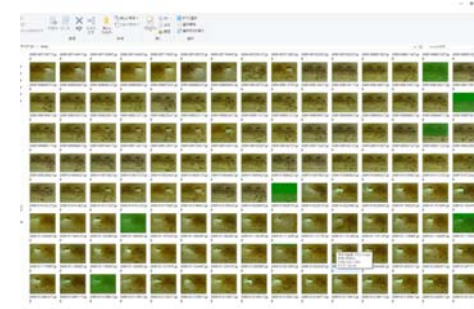
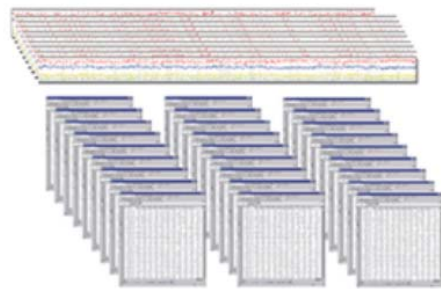


Digital era enables timely technical co-operation by AGCC.
All data is transferred securely .

Data logging and monitoring system

PLEASURE®

Any time, any scale, actual data can be shown you immediately.



Quick displaying and High speed scrolling

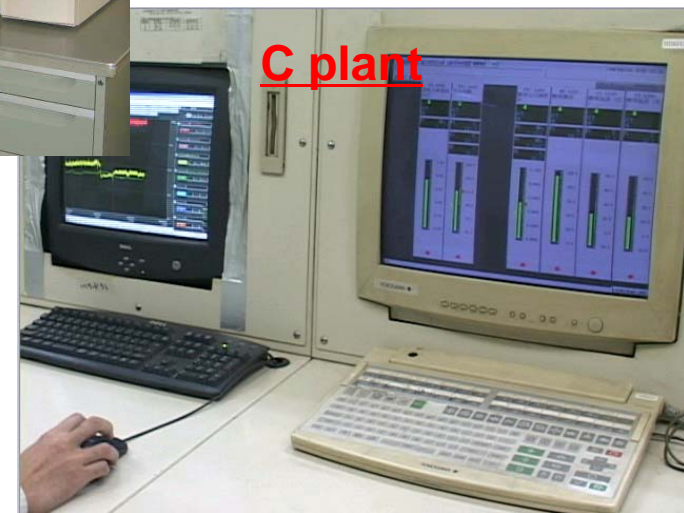
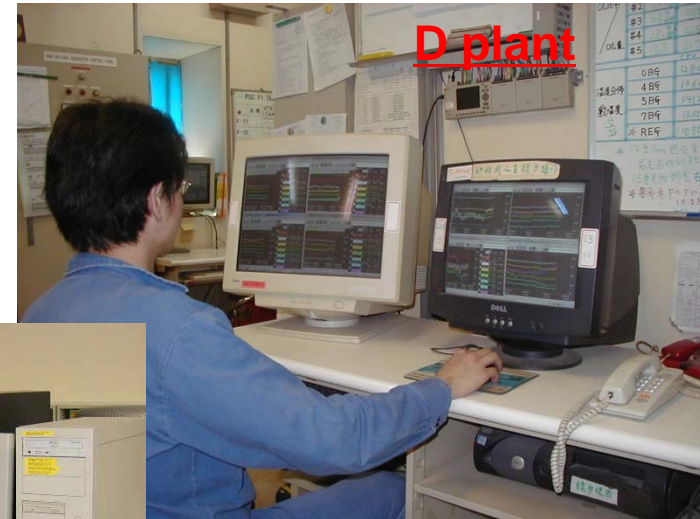
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Periodical onsite check by AGCC



Not only digital data but onsite check is important for long life and stable operation.

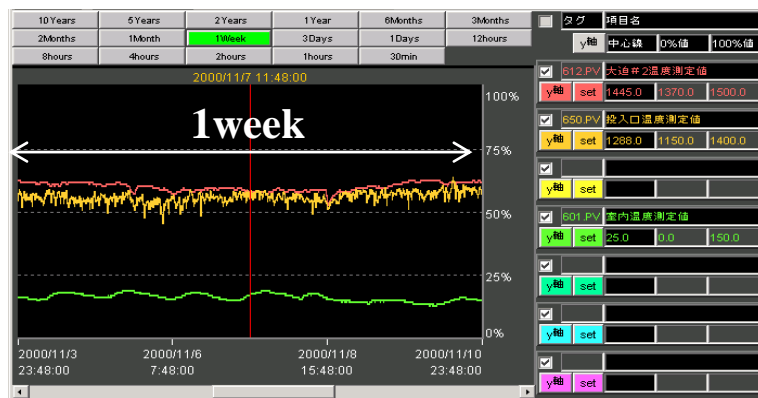
Actual case in AGC group



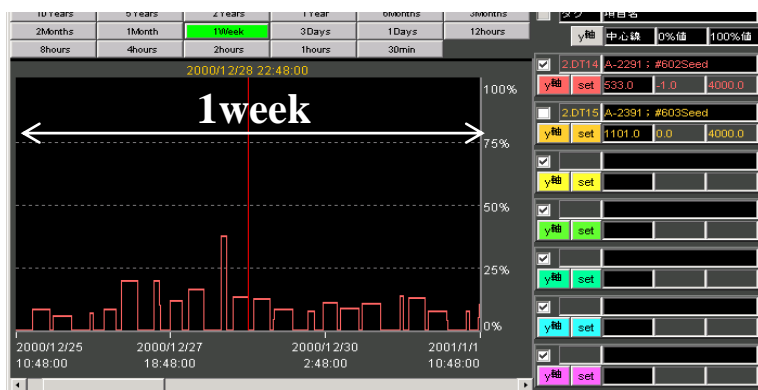
Sheared by company LAN

Furnace data with glass quality

Furnace upper temperature

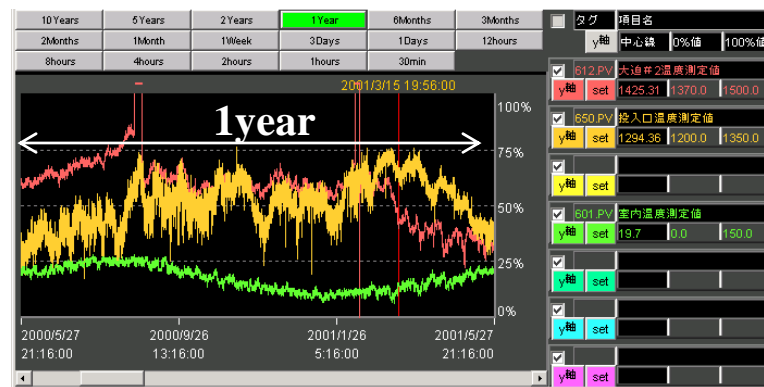


Quality data (Blister loss)

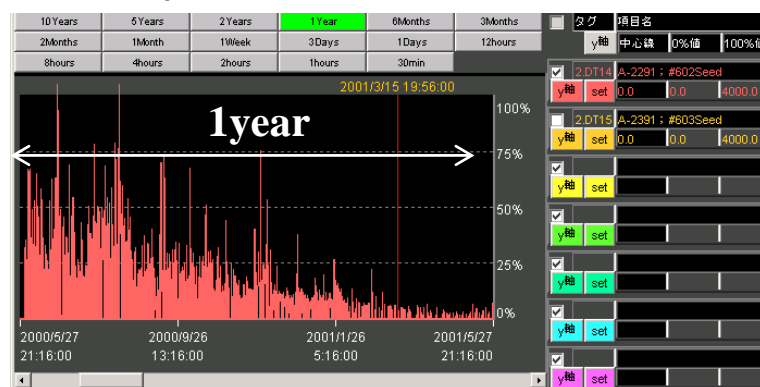


Short-term

Furnace upper temperature



Quality data (Blister loss)



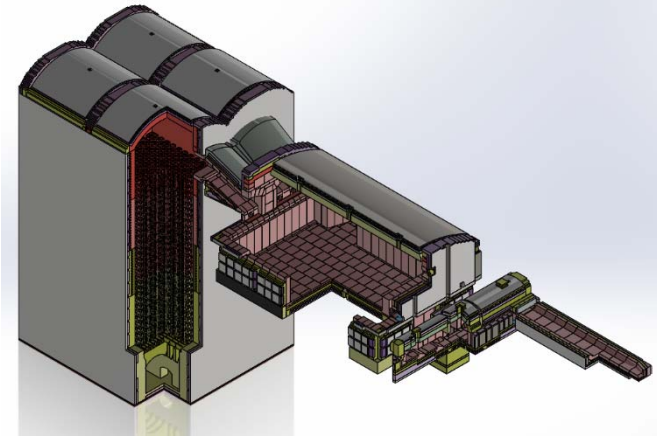
Long-term

Success stories

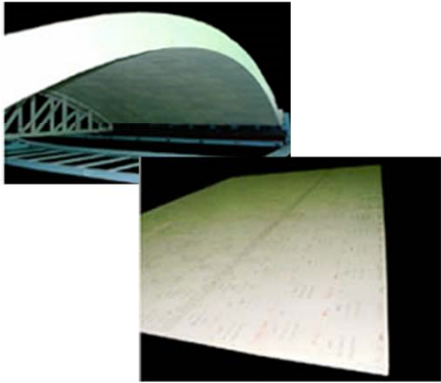
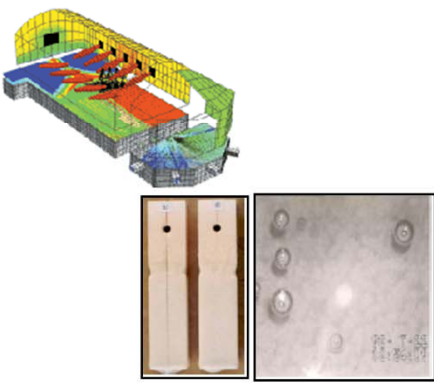

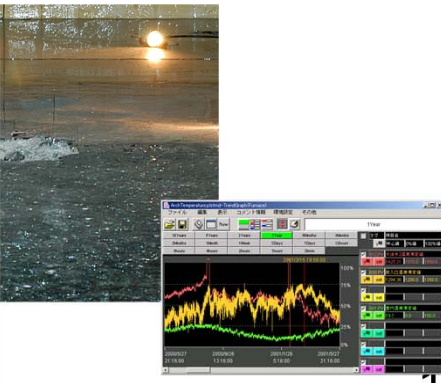
Item	Countermeasure
A quick reference of huge past data	Corresponding to the early detection of abnormal
Grasp the regularity of the defect generation timing	Change the operation
From the data fluctuation, it finds an error of the control logic	Modification of control logic
Failure of measuring instrument which was the cause of fluctuation in furnace temperature was discovered	Correct defect of instrument
It turns out that there is a rule for long-term temperature fluctuation due to long-term refractory ceramics wear	Change to operation guidelines that take long-term fluctuations into account

Sustainable approach to optimize furnace operation

- Low energy consumption
- High reliability and long life
- High quality glass



Approach

<i>Refractory material</i>	<i>Analysis</i>	<i>Engineering</i>	<i>Accumulate experience</i>
			

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Thank you!