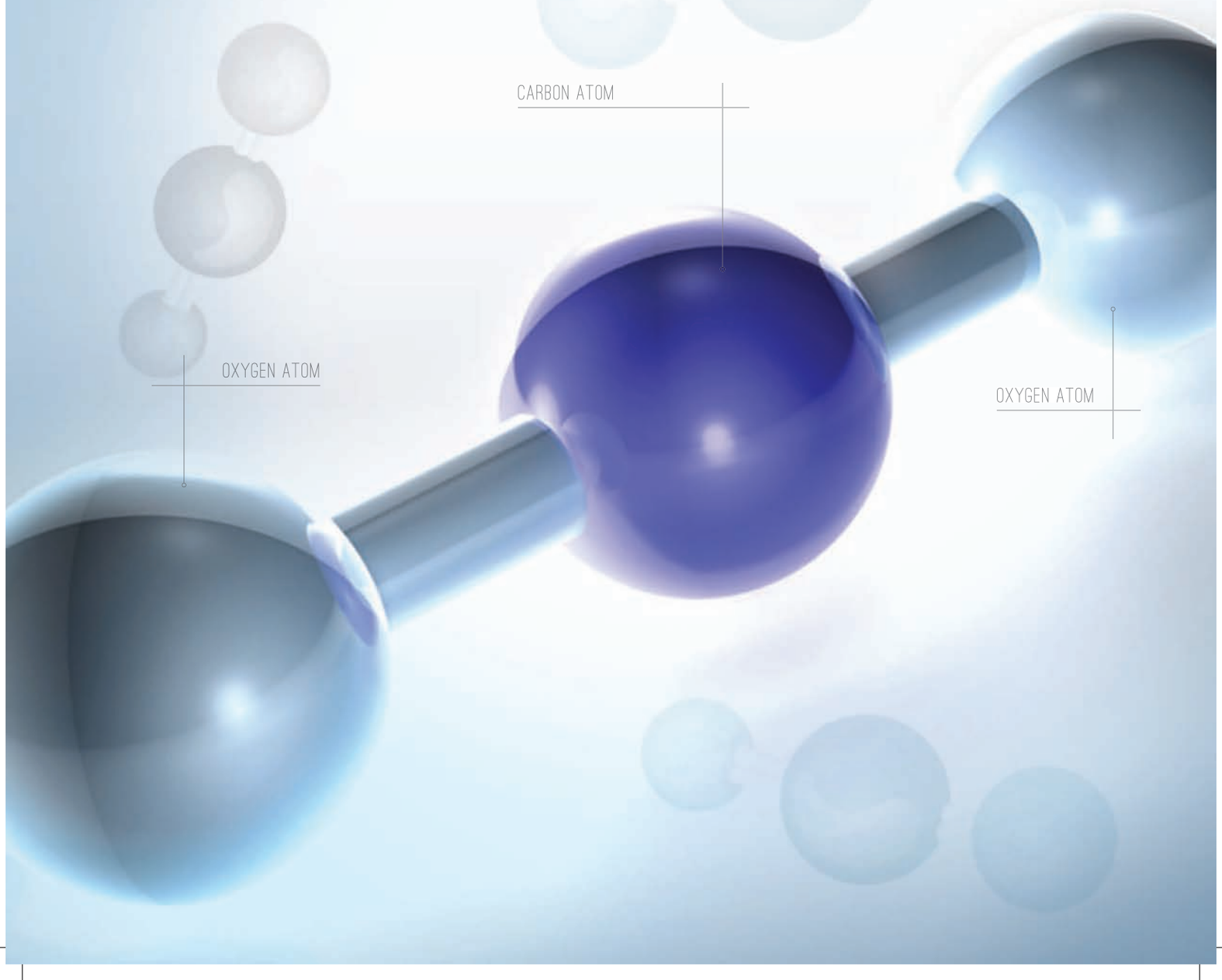
HISAKA 誠心
...WITH OUR SINCERITY "MAGOKORO"

PRODUCT CATALOGUE

for CO2 Capture / Recovery Process



WE are HERE
HISAKA, YOUR TRUSTED ASIAN BRAND

for CO2 Capture / Recovery Process

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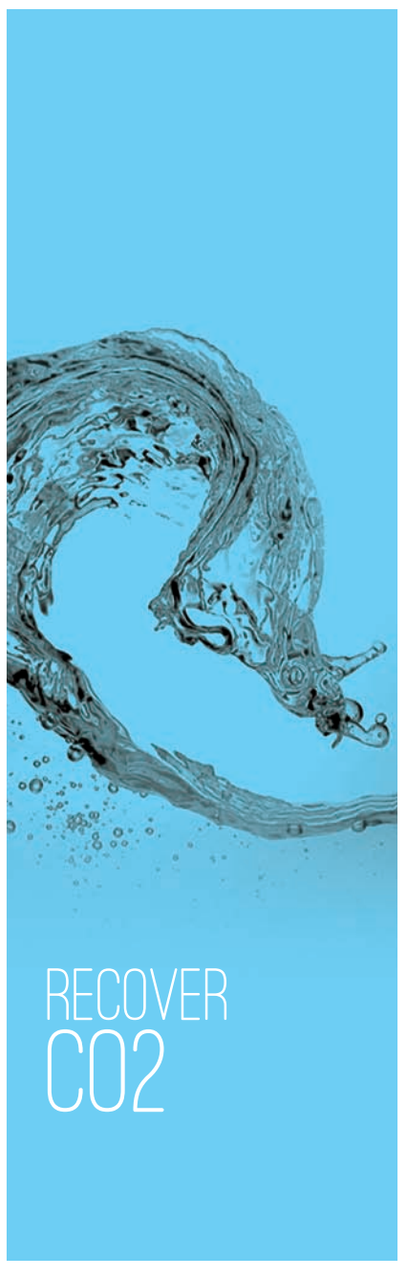
INTRODUCING

Hisaka Works proudly presents a plate heat exchanger to save more energy and lower the production cost of processes. The SX-80 series. Carbon dioxide capture and recovery has been a very preferable process as it reduces carbon dioxide pollution and the recovered carbon dioxide can then be used for many other applications. Such is a truly 'green' idea of the 21st century. With the use of HISAKA SX-80 series, these process can happen more effectively, more productively, and most importantly, less costly.



SX-80 Series

With the high NTU (Number of Transfer Units), SX-80 is still able to upkeep the heat transfer performance.

Contributing to the new environment with the new advanced GREEN technology. There are several methods in recovering CO2, which the more popular method in the market is chemical adsorption using AMINE solution.

When lean amine contacts with the gas released (which contains CO2), CO2 is selectively adsorbed by lean amine. After the adsorption, lean amine becomes rich amine and is sent to a stripper for the release of CO2. In this process, rich amine shall be heated up and lean amine shall be cooled down. HISAKA can proudly provide our SX-80 for this application, being the vital tool in exchanging the heat between rich and lean amine, minimizing the overall energy consumption. SX-80 series is a specially developed Plate Heat Exchanger for CO2 recovery process. Due to the unique design of the gasket made of a special composition, its gasket life is prolonged and lasts longer than previous designs. In addition, adopting the new advance plate corrugation pattern can improve the performance of heat transfer. As a result, SX-80 can save the maintenance cost, shorten the plant's downtime, minimize the consumptions, and ultimately maximize the productivity.

PLATE HEAT EXCHANGER
for Co2 Capture / Recovery Process

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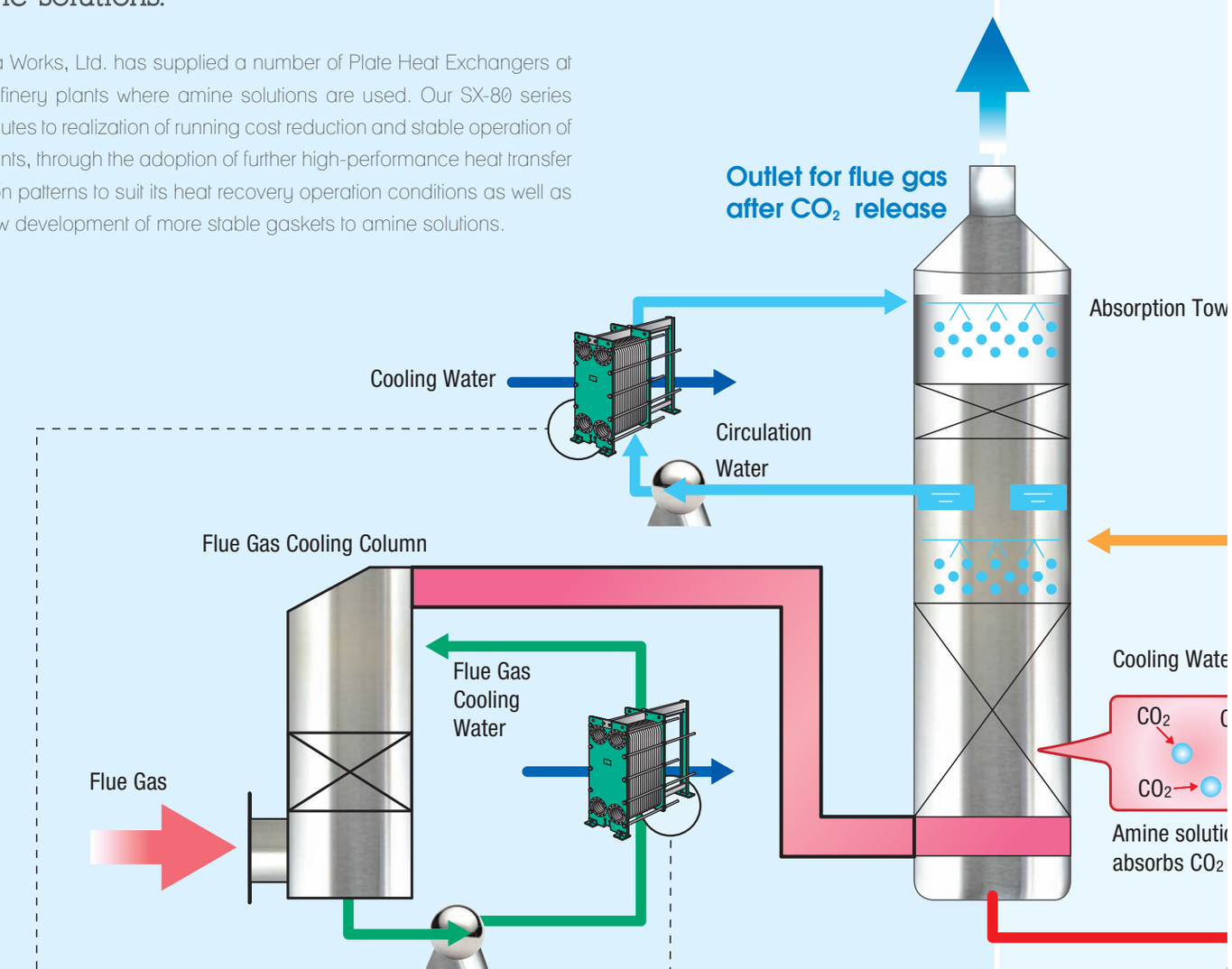
SX-80 series dramatically improves operation efficiency through its innovative plate design and gasket improvements of more stability to amine solutions.

Hisaka Works, Ltd. has supplied a number of Plate Heat Exchangers at gas refinery plants where amine solutions are used. Our SX-80 series contributes to realization of running cost reduction and stable operation of the plants, through the adoption of further high-performance heat transfer chevron patterns to suit its heat recovery operation conditions as well as the new development of more stable gaskets to amine solutions.



ABSORPTION TOWER CIRCULATION WATER COOLER

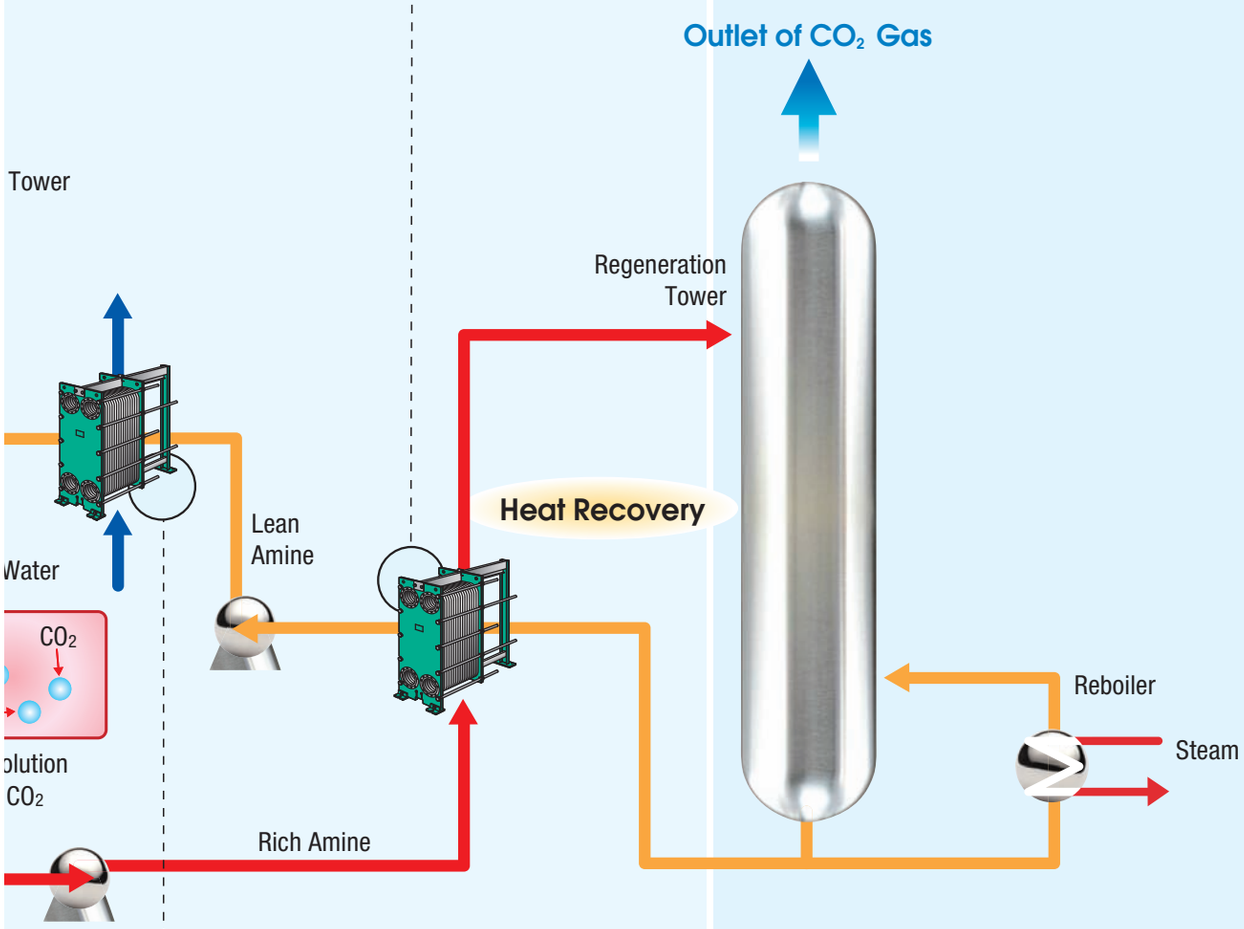
Plate Heat Exchangers are to cool top circulation water to cool flue gas from Absorption Tower.

FLUE GAS COOLING COLUMN WATER COOLER

Plate Heat Exchangers are to cool cooling water used to cool high-temperature flue gas.

RICH/LEAN AMINE HEAT EXCHANGER

Amine solution (generally called Rich Amine) where CO2 is absorbed at Absorption Tower needs to be heated in order to release CO2 at Regeneration Tower. Plate Heat Exchangers are normally used for heat recovery, to then reduce the volume of steam for the Regeneration Tower by use of heat of Amine solution (generally called Lean Amine) that CO2 has been released.



LEAN AMINE COOLER

Plate Heat Exchangers are to cool amine solution (Lean Amine) from which CO2 is removed, in order to return to Absorption Tower.

Features of SX-80 Series

1 PLATES :

a marvelous level of heat recovery as well as stable sealing performance at this temperature range

Our SX-80 series adopts the most suitable plate design for higher NTU for amine operation conditions of Lean/Rich Amine heat recovery. These plate series are developed, by use of our whole thermal and hydraulic knowledge that we've got ever through our long experiences, to feature the highest heat transfer performance with less pressure drop. By this, Rich Amine will be able to be heated up by Lean Amine, then steam consumption required at Regeneration Tower will be able to be extremely reduced. At the same time, Lean Amine will be able to be cooled down, which make cooling water consumption reduce for/at Absorption Tower. Only the SX-80 series allows such highest energy-saving operation with use of the smallest size of Plate Heat Exchangers. Also, Our SX-80 series has a variety of plates to then optimize its design for every specification condition.

On the other hand, SX-80 series has a unique feature of gasket sealing groove to have advantage to maintain stable gasket seals even by swelled gaskets by amine solution.

2 GASKETS :

a characteristic effectiveness to amine solutions themselves and at such higher operation temperatures

Desirable features for gaskets of Lean/Rich Amine Heat Exchangers are both swelling-resistant performance to amine solutions and higher temperature resistance at approx.130°C at CO2 regeneration(desorption). Most effective compounds of gaskets are adopted in our SX-80 series gaskets for more stable sealing performance.

3 CONSTRUCTION :

easy maintenance by dismantle, as like conventional Gasket-type Plate Heat Exchangers

Flue gas normally contains a bit hydrocarbon content like a soot, and Rich Amine after Absorption Tower (CO2 rich) may make plate surface fouled and dirty. In order to make continuous operation efficiently, therefore, periodical maintenance by complete cleaning is required.

SX-80 Series is possible to be dismantled and manually cleaned plate by plate, and at the same time visually checked, same as conventional Gasket-type Plate Heat Exchanger, while Shell-and-Tube Heat Exchanger and welded type Plate Heat Exchanger (incl. semi-welded type) seem to be difficult in dismantling.

4 INITIAL COST-SAVING :
further compact and light-weighted size

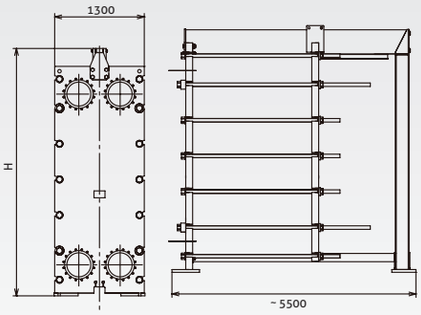
In addition to smaller heat transfer area, due to highest thermal performance (heat transfer co-eff.), higher pressure-resistance is achieved by unique plate and sealing design, although this amine process operates at high temp., rather than conventional Gasket type Plate Heat Exchanger. By this, the SX-80 series enables further compact and light-weighted size.

Moreover, our SX-80 series is capable of design optimization for every specification from three different patterns. As the result, it will realize initial cost-saving for new PHE units themselves as well as for easy handling and installation.

5 OPERATIONAL COST-SAVING :

Not only extreme steam consumption reduction at Regeneration Tower for heating up, as stated in Feature 1, but also less maintenance frequency due to stable gasket sealing performance will contribute to enormous operational cost-saving.

[Dimensional Information]



Heat Transfer Area: 150 ~ 2200m²

Dimension:

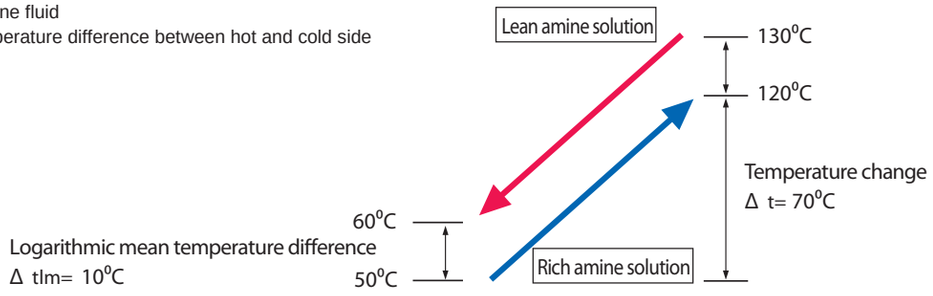
Type	H mm
SX-80S	3000
SX-80M	3600
SX-80L	4200

Connection: 350mm / 14" or less

NTU = U・A／G・C　p=Δ t／Δ tlm

U : Overall heat transfer coefficient
A : Heat transfer area
G : Flow rate of fluid
Cp : Heat capacity of fluid
Δ t : Temperature change in one fluid
Δ tlm : Logarithmic mean temperature difference between hot and cold side

$$NTU = \frac{\text{Temperature change}}{\text{Logarithmic mean temperature difference}} = \frac{70}{10} = 7.0$$



PRODUCT CATALOGUE

for CO2 Capture / Recovery Process

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