



Co2 Transcritical systems for Marine

Coolfish-28/5-2021

Yves Ladam – R&D Manager

SeaCool - RSW

- Intended to replace the R22 RSW system
- The first project was initiated by SINTEF/NTNU
 - Prototype - Heavy and expensive
 - The boat is operating in west Africa
- Development of seawater cooled gascooler and RSW evaporator
- 50+ Units delivered

Prototype 1
Fluidd



2010



SeaCool
Prototype



2014



SeaCool
Standard
type

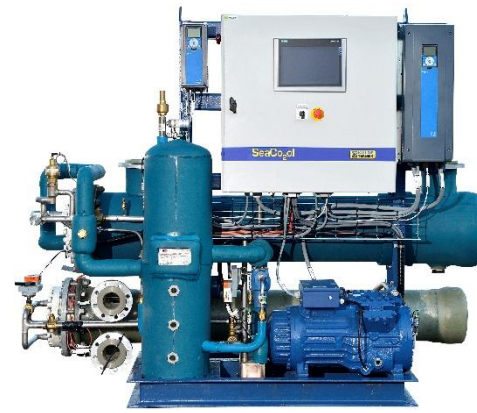


2016 -

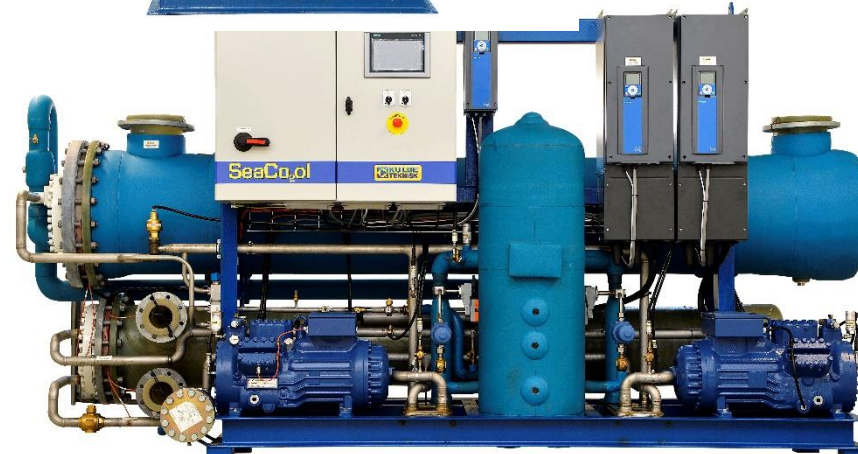
SEACOOOL

- Capacity: 50 - 450kW
- CO₂ Transcritical units
- Small charge
- Ejektor
- Variable frequency compressors
- RSW cooler and gas cooler with titan tubes
- Advanced control system
 - Remote control via internett
 - Valve control og RSW valves
 - Temperature logg ++

SC80



SC300



SC450



Some references



**Båragutt,
2010**



**Nordsild,
2015
SC300**



**Sander Andre,
SC350**



**Sander Andre,
SC250**



**Nordhavet,
SC450**



**Sander
Andre,
SC450**



Knut Olav



**Støttfjord
SC350**



**Ballstadværi
ng, SC150**



Blokken SC80



**Blokken
SC80**



**Skole skip
Hvide Sande**



thawing

**Norway
Seafood
Stamsund**

Wilsgård

**Wilsgård
Lakseslakteri**



SinkabergHanser

**Sinka Berg
Hansen
Lakseslakteri**

HOFSETH

AQUA

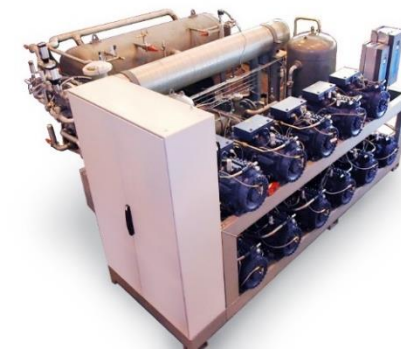
**Hofseth Aqua
Lakseslakteri**

Heat recovery
50% of condensation heat

SuperFreeze

- Intended to replace the R22 Freezing system
- Roaldnes 2014 (prototype)
 - Seawater cooled
 - Booster
 - Pumped system
 - Freezing capacity 40t/day
 - Co2 resulted in a 25% higher freezing capacity
- 10+ systems delivered

Prototype 1



2014



SuperFreeze
Prototype



2015



SuperFreeze
Standard
type



2016

25% faster freezing

SuperFreeze

- Capacity: 10 – 60 tonn freezing capacity /day
- Designed for -50 °C
- CO₂ Transcritical units
- Pump cirkulated
- Special heatgas defrost - efficient
- Variable frequency compressors
- Gas cooler with titan tubes
- Advanced control system
 - Remote control via internett
 - Valve control og RSW valves
 - Temperature logg ++



Some references



Roaldsnes, 2015
Prototype
Fryser trålfanget fisk



**Lofoten
fryseri, 2016**

combi RSW / freeze



Arnøytind, 2016
Kombianlegg



**Nybygg
SC21,
2017/18**



Arctic filet, 2016
Innfrysing av lakse
filet



**M/S Jens
Kristian
2018**

Aircooled
Blast freezers

Further developments

- SeaCool with higher Capacity (Dorin compressors)
- Cascade co2 / ammoniakk freezing units
- Brinefreezing



THE VALUE OF
PERFECT TEMPERATURE