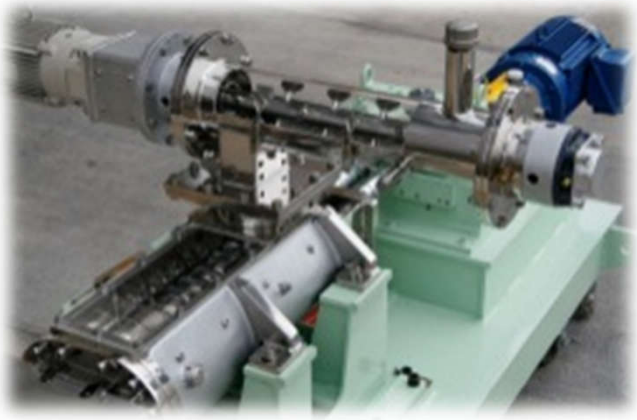
# Kurimoto社 설비 소개서

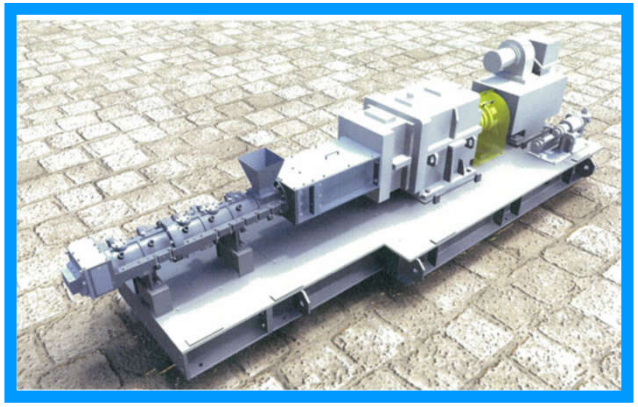
## KRC Kneader & Hybrid Reactor

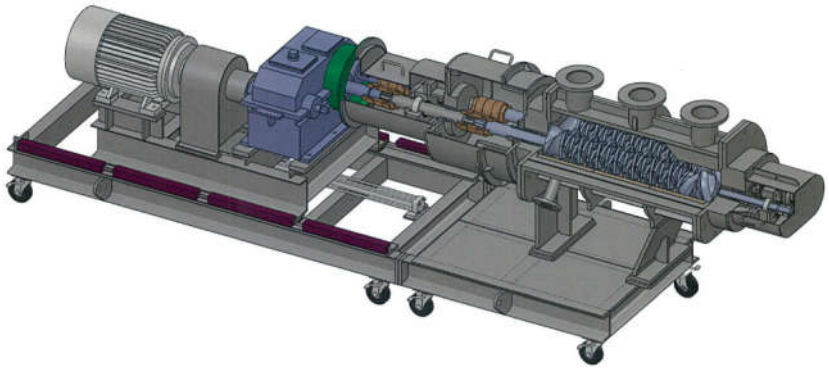
2021年2月

# 2축 셀프크리닝식 연속장치의 소개

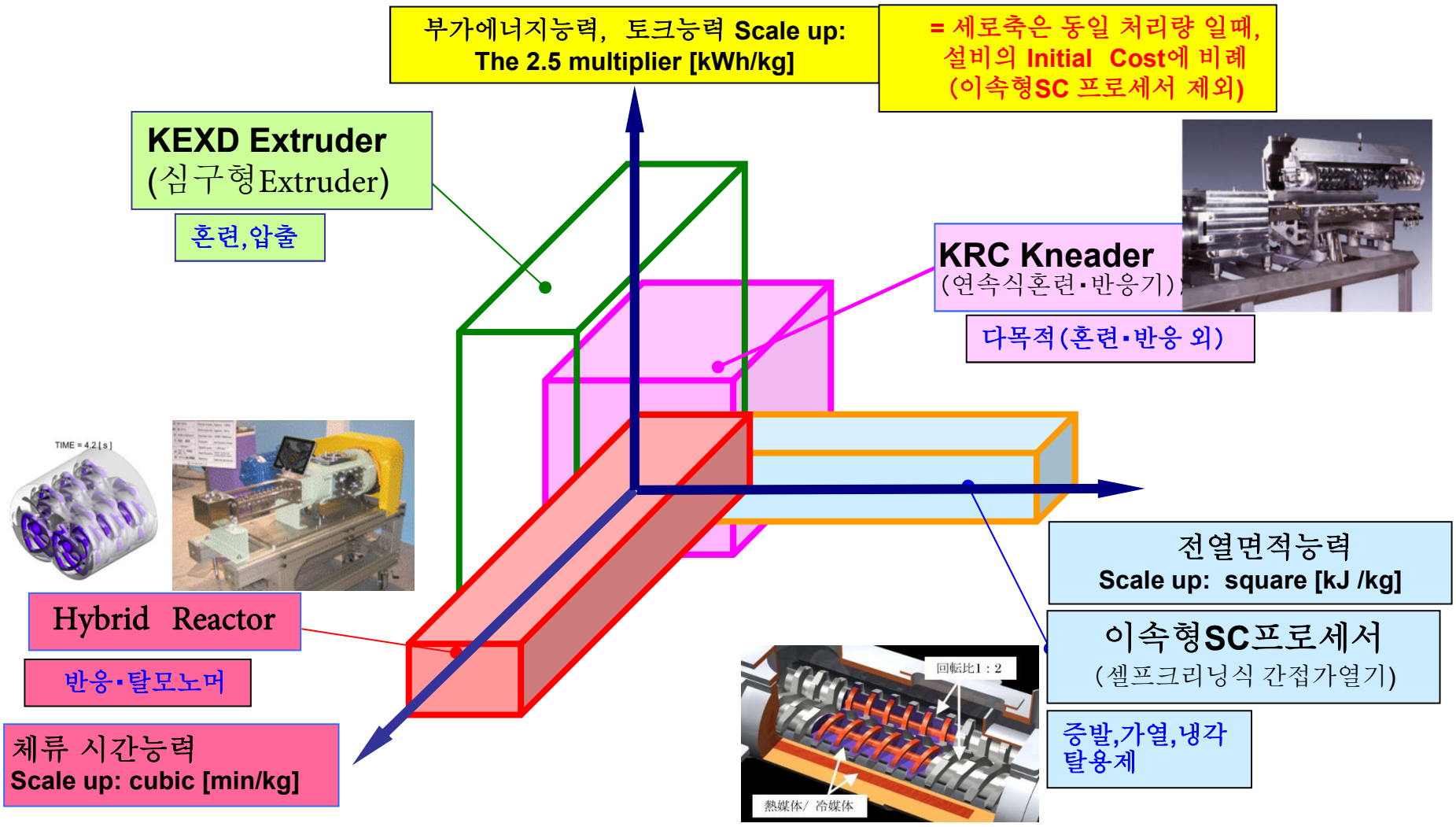




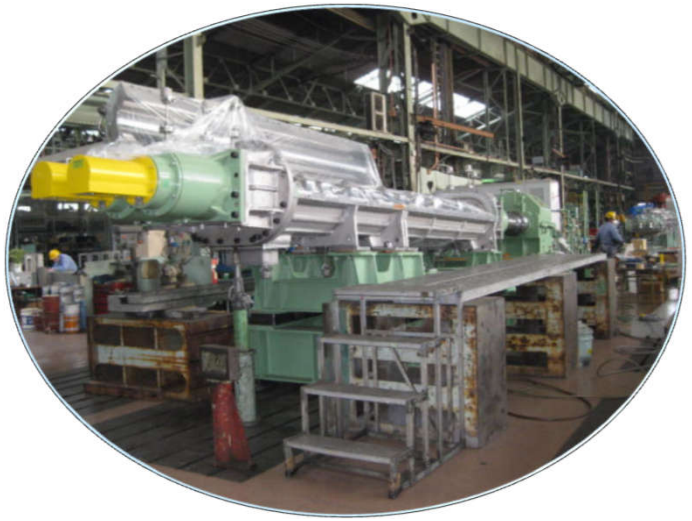




# 2축 셀프크리닝식 연속장치 Line Up

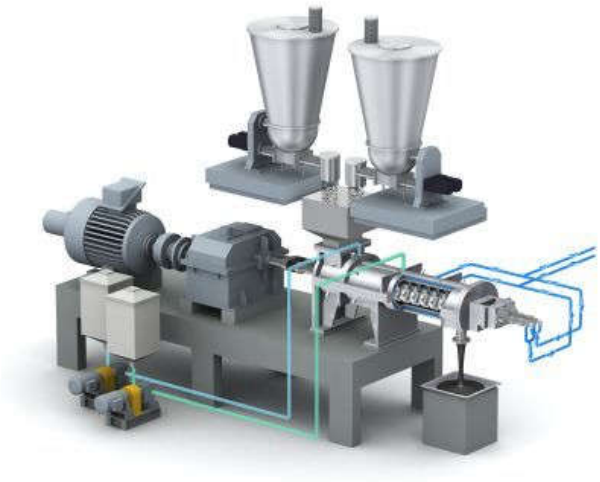


# KRC Kneader 연속식 혼련·반응장치



# KRC Kneder의 특징

■짧은 L／D로 뛰어난 연속혼련성능을 가지며,
압출기와 비교시 저동력으로 저렴한 장치 제안 가능



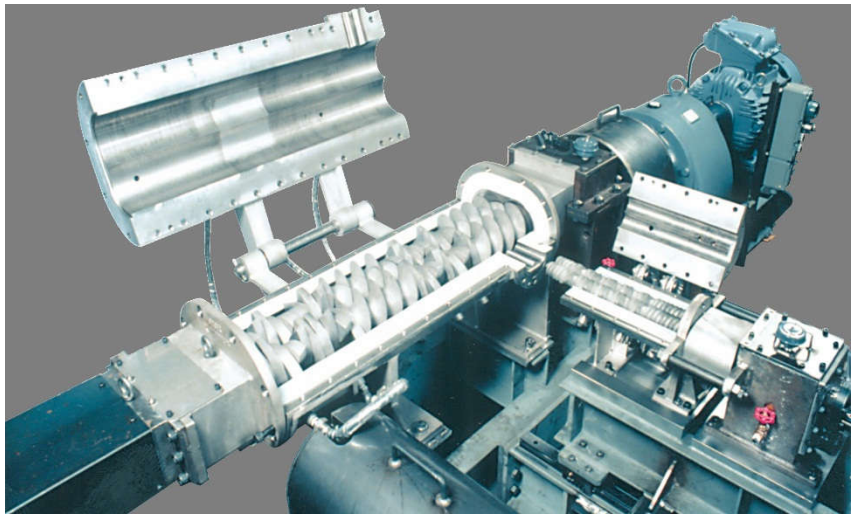
■주축 양단에 축 받이를 설치하고, 패들과 동체가
접촉하지 않는 구조이기 때문에 동체, 스크 류,
패들에 저렴한 SUS나 그외 여러 가지의 재질로
제작이 가능. 금속이물 발생이 적음.

■동체는 분해·세정이 용이한 상하 분할구조

■패들은 한쌍씩 자유롭게 조합이 가능

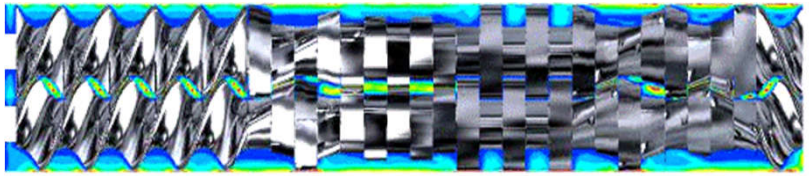
■우수한 동방향 회전의 셀프크리닝성

■1,200대를 넘는 (한국100대 이상)납입 실적
약5000건의 Test 실적과 풍부한 노하우

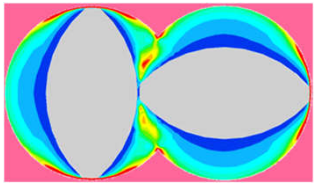


# KRC Kneder의 혼련기구

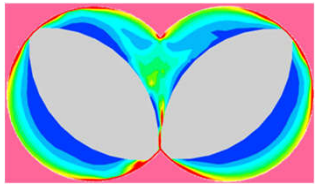
■패들은 한쌍씩 자유롭게 변환이 가능하여, 용도와 목적에 따라 패들을 조합하여 구성 가능



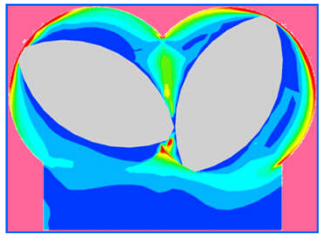
■한 쌍의 패들은 언제나 한쪽의 끝이 다른 한쪽의 외곽면을 스치듯이 회전함 (셀프크리닝 기구) 따라서 원료는 체류 편차가 작게 출구로 보내어짐



■혼합·혼련대상 원료는 패들의 회전에 의해서 압축·연신의 체적변화를 받음과 동시에 바렐과 패들간, 패들과 패들간에서의 동방향 회전에 의해 끝단에 의한 작용을 받아, 혼련·분산 효과를 높인다

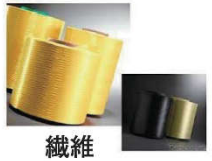
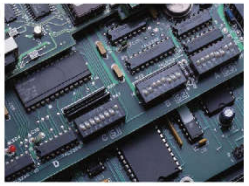
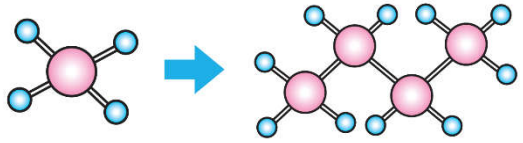


■표준의 심구형 패들(S형)에 추가로 높은 토크형도 Line Up(T형)



# KRC Kneder의 용도사례

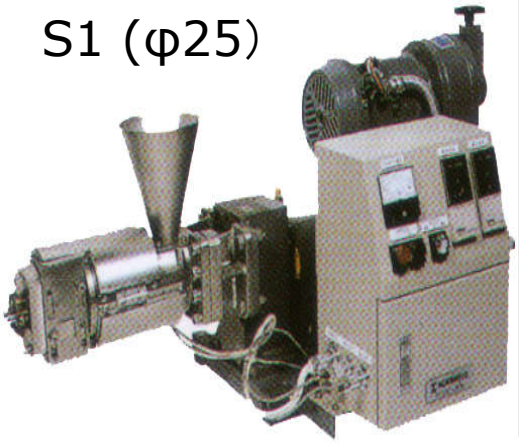
株式会社 栗本鐵工所

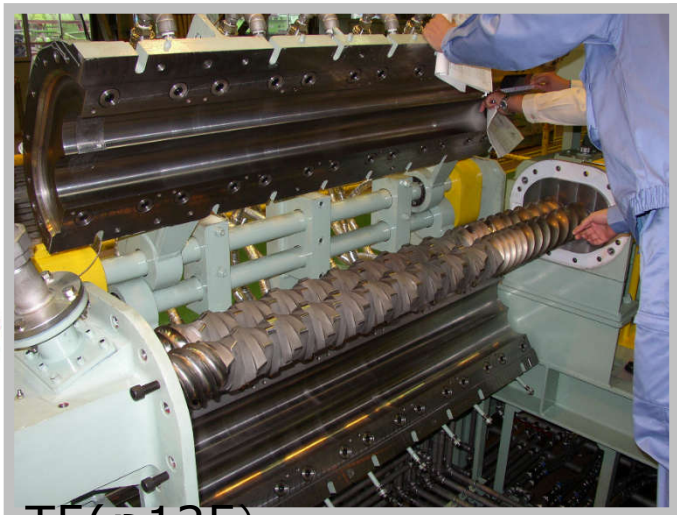
| | | | | |
|---|---|---|---|---|
| 化学工業 |  エンジニアリングプラスチックス |  シーリング剤 |  繊維 |  塗料 |
| | |  接着剤 |  触媒 |  中空糸膜 |
| 電子部品 |  半導体用封止材 |  トナー |  電池 |  光学材料 |
| 医薬・食品 |  トローチ |  人工甘味料 |  結晶セルロース |  チョコレート |
| 混練・分散 |  スラリー・ペースト |  樹脂コンパウンド |  高分子化合物の重合反応 | |

# KRC Kneder의 실적사례



S1 (φ25)





T5(φ125)

S8(φ200)

S12(φ300)

S24 (φ600、POM등의 엔지니어링플라스틱 중합용)

# KRC Kneader

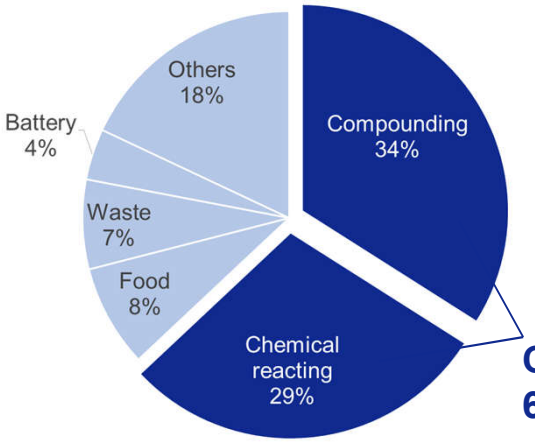
## Applications

1. **Kneading of plastic and chemical products**
2. **Mixing, Kneading in food industry**
3. **Kneading of ceramic and electronic material**
4. **Polymerization and chemical reaction**
5. **Waste disposal and recycling process**

## Chemicals

- Engineering plastic
  Epoxy, Phenol, Urethane,
  Acrylic, PA PC, POM, TPU
- Sealant & Adhesive
- Fiber & Hollow Fiber
- Paint & Powder coating
- Catalyst
- Reacting

## Data of Sales Record




**Chemical 63%**

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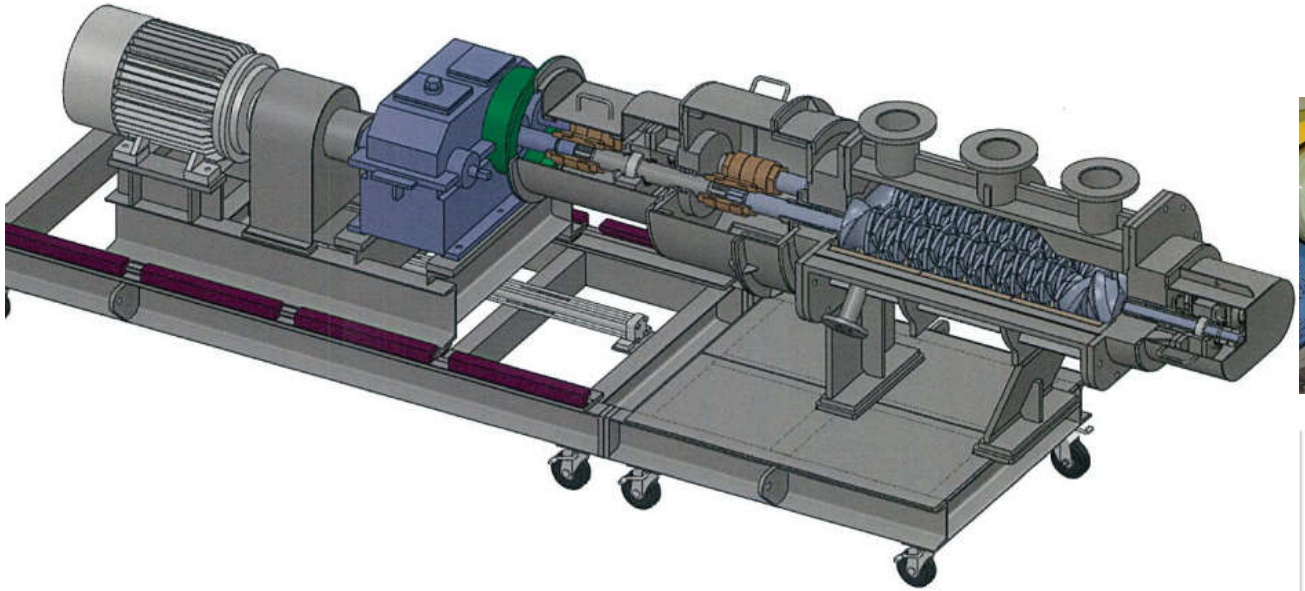
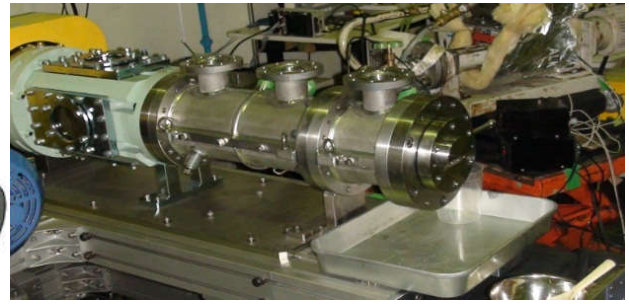
# HYBRID REACTOR (연속식반응·탈용제장치)







## 개요

☆ 고점도물의 연속반응장치
(중축합·용액중합 외)

☆ 각종공정의 Finisher、
Finisher 전의 중합.

☆ 고도의 탈 모노머, 탈휘장치

- 각종공정에서의 연속식 대형화장치
  (내부 용적최대**50m3**정도)로써 사용
- 동일 내용량으로 큰폭의 Cost **Down**이 가능

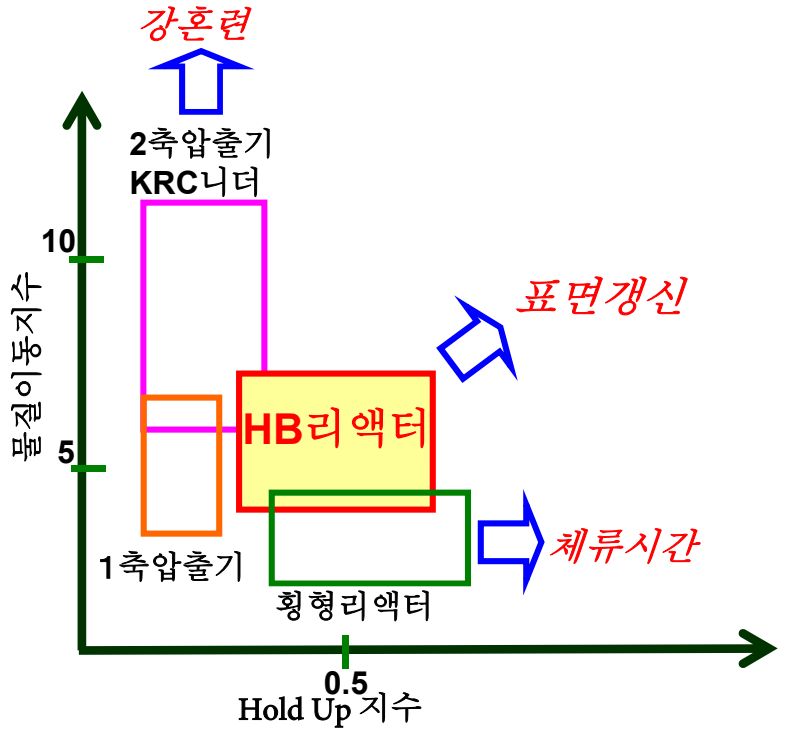
# HYBRID REACTOR (연속식반응 · 탈용제장치)

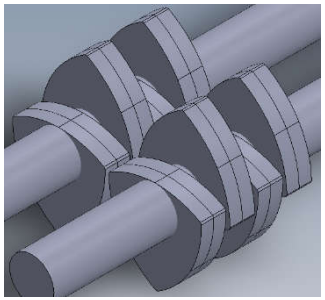


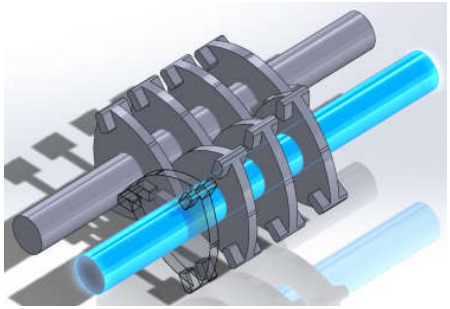
*동일 내부 용량으로 큰폭의 Cost **Down**이 가능*

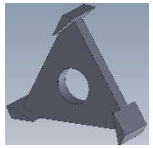
*장치내의 표면갱신을 **UP**하고 원료의 움직임을 증가시켜 반응을 촉진*

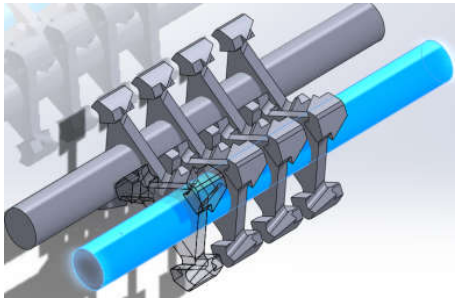
*목적에 따라서 여러 가지 날개 형상을 선정*

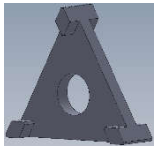










# HYBRID REACTOR *(연속식반응·탈용제장치)*



## 주요 용도

### 반응계 (중축합·유화·용액 등)

*에스테르화 반응*
*(폴리에스테르, PLA수지 등)*

*폴리아미드수지*

*폴리카보네이트수지계*

*고흡수성폴리머*

*초산(아세테이트)비닐계*

*아크릴계수지*

### 탈모노머, 탈휘

*폴리스틸렌*

*폴리아미드*

*PET 등*

} 모노마
올리고머
용제를 제거

# Hybrid Reactor

## Applications

1. **Polymerization and chemical reaction**
2. **Removal of Residual monomer**
3. **Removal of Solvent from "falling-drying-rate" period**

## Chemicals

・Super Engineering plastic

PSF, PA46, LCP

・Engineering plastic

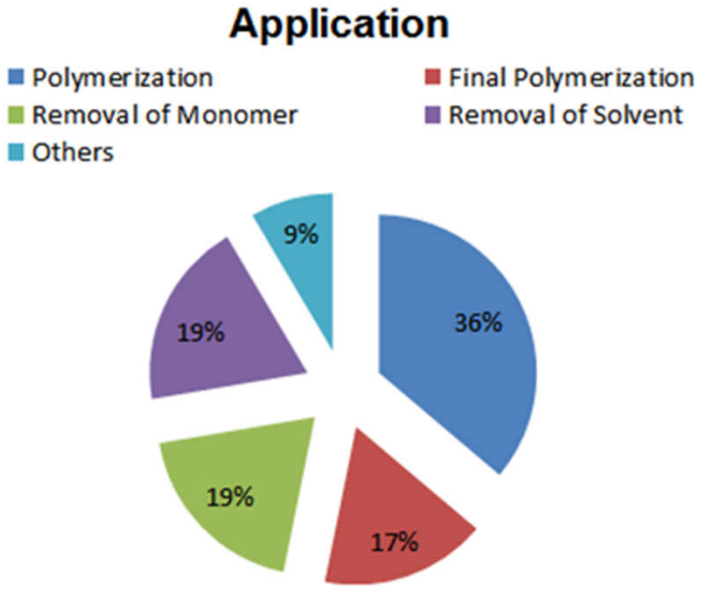
Epoxy, Phenol, Urethane, PA6, PA66, PC, PP, PET, PLA

・Sealant & Adhesive

Acrylic

・Others

S-SBR, Elastomer

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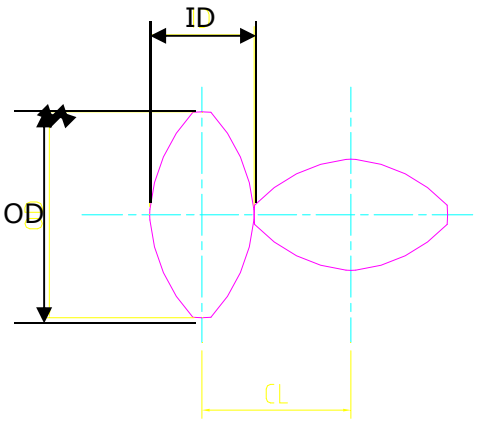
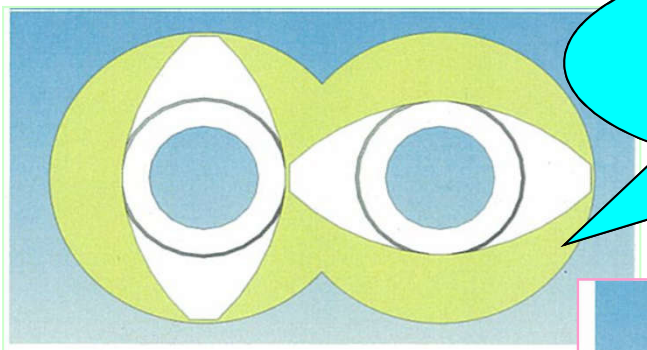
# SCREW PADDLE 단면

날맞품비 = 패들의 직경 (OD) /패들폭
(ID)표준 Extruder = 약1.5
**KEXD & KRC (2 인치) = 약 1.9･･･심구형**

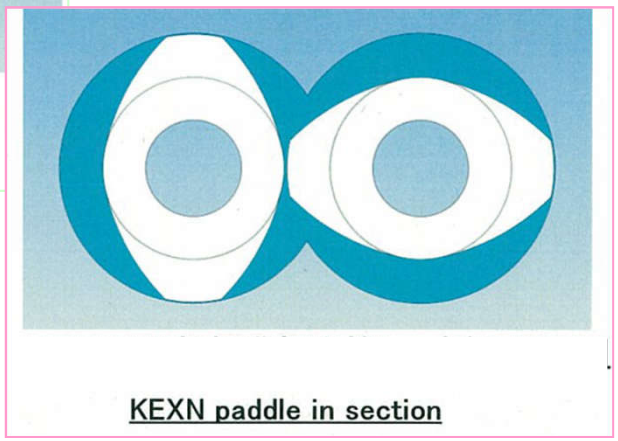



Basic design data for Screw



KEXD paddle in section

단면적 : 1. 4배
※당사비교



KEXN paddle in section

# APPLICATION EXAMPLES

| | Chemical Compound | Chemical Reaction | Ceramic/ Inorganic | Foods/ Pharmaceutical | Waste disposal |
|---|---|---|---|---|---|
| ***KRC® Kneader*** | Sealant, Adhesive, Agrochemicals, Catalyst, Magnetic paints, EMC, Phenol, Rubber, Powder paints, Ink, Toner | Engineering plastic, Fiber | Ceramics, Pesticide, Battery paste (Lo-ion, Ni-Cd, Alkaline) | Chocolate, Dough, Coffee, Tabacco, Pharmaceuticals, Cereal bar, Candy bar, Chewing gum, Cheese | Fuel, Sewage, Sludge cake |
| ***KRC® Hybrid Reactor*** | | Engineering plastic, Esterification, Desiccation/Condensation reactions | | | |
| ***SCPD*** | Disolvation of resins | Organic materials | Crystallization, Disintegration, Drying of inorganic slurry | | Fuel, Sewage, Sludge case, Waste solutions |
| ***KEXD*** | Thermoset resins, Engineering plastic, EMC, Powder paints, Pigment, Ink, Toner | Polymer alloy | Inorganic filler | Snack bar, Starch cooking | |
| ***Batch Mixer*** | | Hygiene polymer | Graphite specialties, Activated carbon | | |

*Above are only examples among many application records.

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# Test Machine Lineup

株式会社 栗本鐵工所

| Line Up | Size | Screw dia. | L/D | Effective volume | Ultimate vacuum |
|---|---|---|---|---|---|
| KRC Kneader | S1 | φ 25mm (1″) | 10.2 | 0.12L | 350℃-30000Pa |
| | S2 | φ 50mm (2″) | 10,13.2 | 0.9L, 1.2L | |
| | S4 | φ 100mm (4″) | 10 | 8.8L | |
| | S5 | φ 125mm (5″) | 10 | 17L | |
| Hybrid reactor | 0.12L | φ 25mm (1″) | 4.5 | 0.12L | 350℃-100Pa |
| | 8L | φ 100mm (4″) | 4.5 | 8L | |
| SC Processor | SCPD-100 | φ 100mm (4″) | 6, 9 | 4L, 6.1L | 250℃-4000Pa |
| KEXD Extruder | KEXD-50 | φ 50mm (2″) | Max.30 | 2.7L | - |

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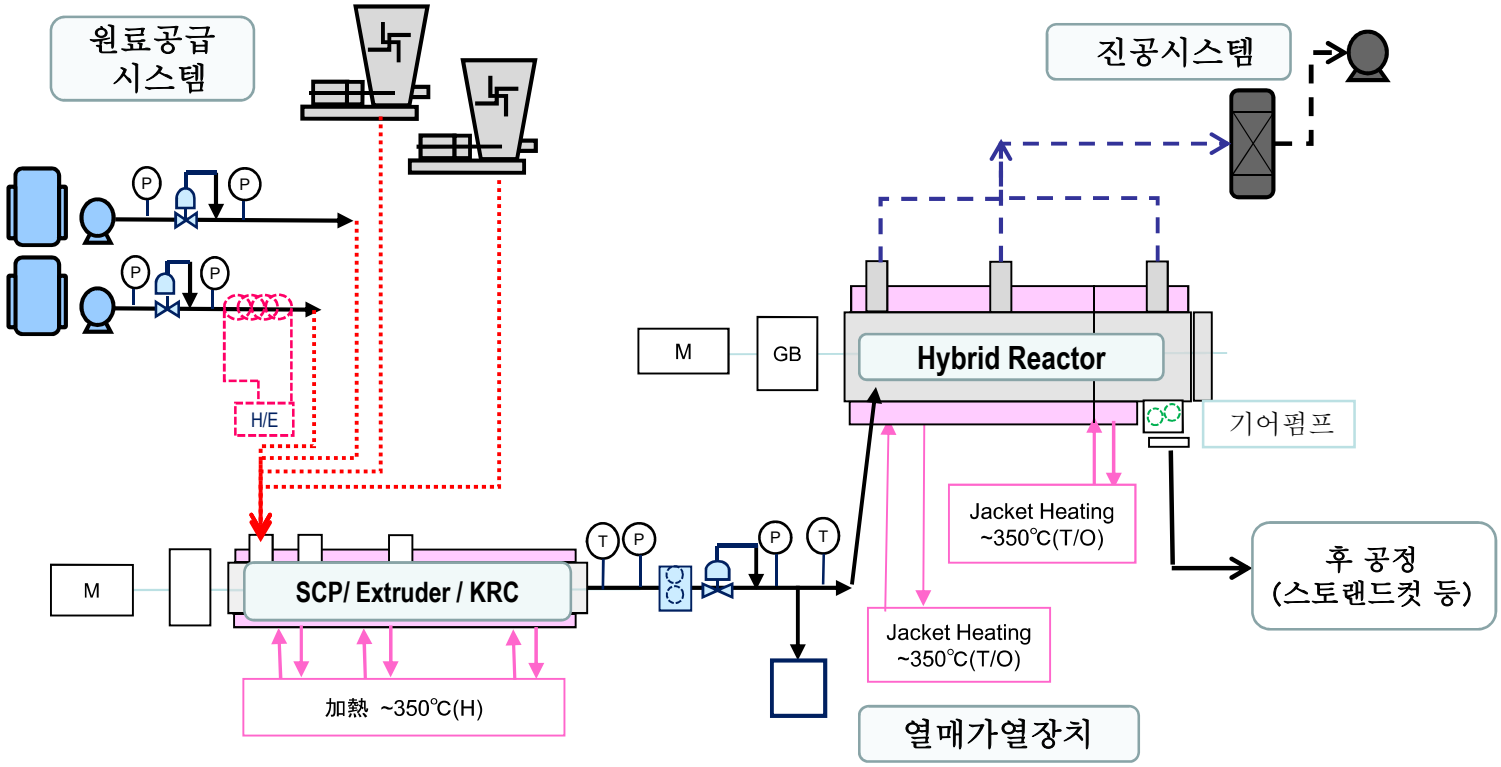
# TEST설비 (예시)


원료공급
시스템
진공시스템
P
P
P
P
H/E
M
GB
Hybrid Reactor
기어펌프
Jacket Heating
~350℃(T/O)
후 공정
(스토랜드컷 등)
T
P
P
T
M
SCP/ Extruder / KRC
Jacket Heating
~350℃(T/O)
加熱 ~350℃(H)
열매가열장치

# TEST CENTER／연락처

## 機械技術センター

機械技術センターでは、粉体に関するお客様のニーズに対応できるよう各種実験設備を完備しております。
粉体の製造・試験・評価はもちろん、処理システムへのラインアップなどにクリモトの粉体技術をどうぞご利用ください。

## Machine & Technology Center

Our Machine & Technology Center is complete with a variety of laboratory equipment to meet every need for powder processing.
The Center always makes the KURIMOTO's powder technology accessible to the customers not only for their production, test, and evaluation of particles but also for a lineup to the processing systems.

## ■ ご照会事項

混練・反応・造粒テストをご照会の際は、下記事項をお知らせください。

1. ご依頼者
   - 貴社名／住所／電話(FAX)／担当者
2. 処理原料
   - 原料名
   - 混合比
   - 粒度および粒度分布
   - 見掛比重（混合物）と真比重（各原料）
   - 比熱
   - 粘度（熱その他による変化の状態）
   - 腐食・汚染防止に対する考慮の要否
   - その他の化学的性質
3. 混合・混練・反応・造粒の目的
4. 処理容量
5. 混合・混練・反応・造粒の目的要求程度
6. 希望のテストフロー
7. 原料入口、出口温度条件
8. 入口、出口取合い条件
9. 反応の場合の発熱量、吸熱量
10. 滞留時間
11. 電源（電圧・周波数）
12. その他ご要望事項

## ■ Inquiries

For inquiries about kneading, reaction, and granulating tests, please inform us of the following items.

1. Client
   - Company name / Address / Tel (Fax) No. / Contact person
2. Processing materials
   - Material name
   - Mixing ratio
   - Particle size and the distribution
   - Apparent specific gravity (of mixtures) and absolute specific gravity (of each material)
   - Specific heat
   - Viscosity (state of changes due to heat or else)
   - Consideration for prevention of corrosion and contamination (required or not required)
   - Other chemical properties
3. Intended purpose for mixing, kneading, reaction, and granulating
4. Processing capacity
5. Desired level of mixing, kneading, reaction, and granulating
6. Desired test flow
7. Material inlet and outlet temperature conditions
8. Coordinating conditions between inlet and outlet
9. Heat release value and endothermic value for reaction
10. Retention time
11. Power supply (voltage and frequency)
12. Other requirements

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**Location of Laboratory Equipment (Material Forwarding Address)**

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각종 Demo기를 갖추고 Test 대응가능

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