

CONTINUOUS MOISTURE REMOVAL. MAXIMUM TRANSFORMER LIFE.

drytrans systems continuously remove dissolved moisture from transformer oil using advanced 3A Molecular Sieve technology—keeping insulation dry, strong, and reliable.



REMOVES DISSOLVED MOISTURE



IMPROVES DIELECTRIC STRENGTH



EXTENDS ASSET LIFE



REDUCES RISK OF FAILURES

WHY 3A MOLECULAR SIEVE BEADS?



- Highly uniform 3A pore structure
- Excellent adsorption capacity
- Regenerable & replaceable at site
- Chemically stable & long lasting
- Designed for transformer oil conditions
- Removes both free and dissolved moisture

OUR PRODUCT RANGE

MMS90

ADVANCED MOISTURE MANAGEMENT SYSTEM



- PLC + Outdoor HMI Touch Screen
- Dual moisture & temperature sensors
- Oil bypass & air removal system
- Integrated safety & leak detection
- Flow switch & no flow trip
- SCADA / DCS communication ready

TR20

SMART MOISTURE MANAGEMENT SYSTEM



- Flow: 100 – 300 LPH
- Lockable IP56 cabinet
- Smart oil return before media replacement
- Internal leak detection
- Media replacement valve at bottom
- Compact, outdoor & user friendly

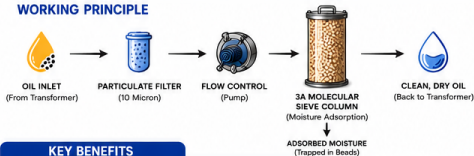
TR5

ONLINE MOISTURE REMOVAL SYSTEM



- Flow: 300 – 500 LPH
- Single cylinder design
- Dual sampling points
- Tilting arrangement for easy media replacement
- Compact & easy to install

WORKING PRINCIPLE



Moisture in oil is attracted to the 3A Molecular Sieve beads and locked inside their microscopic pores. The clean, dry oil is returned to the transformer—continuously.

KEY BENEFITS

- Continuous online operation
- Improves dielectric strength & reliability
- Minimizes risk of insulation failure
- Removes dissolved moisture effectively
- Reduces aging & extends asset life
- Low maintenance & user friendly
- Suitable for harsh environments

IDEAL FOR



PROTECT YOUR TRANSFORMER. PROTECT YOUR INVESTMENT.

Moisture is the #1 enemy of transformer insulation. drytrans systems ensure your transformers stay dry, reliable and perform for decades.

**DRY OIL. STRONG INSULATION.
RELIABLE POWER.**

THE SCIENCE BEHIND 3A MOLECULAR SIEVE TECHNOLOGY

Engineered to remove moisture. Designed to protect transformers. Built for reliability.



CHEMISTRY OF 3A MOLECULAR SIEVE

3A Molecular Sieve is a synthetic, crystalline aluminosilicate material with a uniform pore size of ~ 3 Ångström (0.3 nm).

Chemical Composition

General formula: $M_{2/n}O \cdot Al_2O_3 \cdot xSiO_2 \cdot yH_2O$

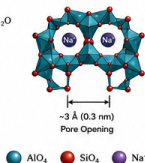
Where M = Sodium (Na⁺)

n = Valency of cation (1 for Na⁺)

Structure: Sodium aluminosilicate with a highly uniform microporous structure.

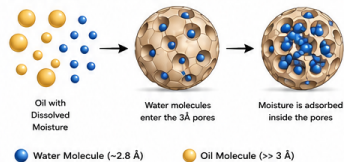
Key Points

- Pore size: ~ 3 Å (0.3 nm)
- Shape: Crystalline, spherical beads
- Color: Off-white to beige
- Odor: Odorless
- Non-toxic and non-hazardous



WHY 3A MOLECULAR SIEVE REMOVES MOISTURE?

3A Molecular Sieve has a precisely controlled pore size of ~ 3 Å (0.3 nm). Water molecules (~ 2.8 Å) can enter the pores, while larger molecules (oil, additives, gases) cannot.



HOW MOISTURE GETS TRAPPED INSIDE THE BEADS?

1 Attraction

Water molecules are attracted to the hydrophilic sites (Na⁺) inside the pores.



2 Adsorption

Water molecules are strongly adsorbed on the internal surface of the pores through ion-dipole attraction and hydrogen bonding.



● - - Ion-Dipole Attraction
- - - Hydrogen Bond

3 Retention

Once adsorbed, water molecules remain tightly held and cannot exit under normal operating conditions.



WHY THIS MOISTURE WON'T GET OUT OF BEADS?

- Strong adsorption energy: Water molecules are held by strong ion-dipole attraction and hydrogen bonding.
- Uniform micropores: The narrow 3 Å pores restrict the movement of water molecules.
- Thermal stability: Stable up to high temperatures ($>250^\circ C$).
- No desorption at service conditions: Under normal transformer oil operating conditions, the beads will not release the moisture back into the oil.



Moisture remains strongly adsorbed under normal operating conditions and is only released during high-temperature regeneration ($>250^\circ C$).

EFFICIENCY OF 3A MOLECULAR SIEVE



Highly efficient and reliable moisture adsorbent.

- Typical water adsorption capacity: 18 - 22% by weight (depending on operating conditions).
- Maintains very low outlet moisture levels (sub-ppm).
- Operates continuously until equilibrium loading is reached.
- Long service life with consistent performance.

ENVIRONMENT & DISPOSAL SAFETY



3A Molecular Sieve is an inert aluminosilicate material.

- Composed primarily of Silicon, Aluminum, Oxygen and Sodium.
- Contains no hazardous chemicals, no cellulose fibers and does not generate harmful decomposition products.
- Disposal should follow local industrial waste regulations and any oil contamination requirements.
- Not classified as hazardous material.

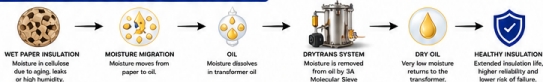
WHY 3A MOLECULAR SIEVE IS BETTER THAN CELLULOSE BASED MOISTURE FILTERS?

3A MOLECULAR SIEVE	VS	CELLULOSE BASED FILTERS
Very high moisture capacity		✗ Low moisture capacity
Removes down to very low ppm		✗ Limited removal to moderate ppm
Not affected by oil quality or oxidation		✗ Affected by oil oxidation and breakdown products
No microbial growth		✗ Prone to microbial growth
Thermally stable ($>250^\circ C$)		✗ Thermal degradation risk
Longer service life		✗ Shorter service life
Consistent & predictable performance		✗ Performance varies with oil condition
Regenerable in industrial applications		✗ Typically disposable

DRYTRANS WORKING PRINCIPLE - CONTINUOUS MOISTURE REMOVAL & OIL CLEANING



HOW DRYTRANS MANAGES MOISTURE EQUILIBRIUM



KEY TAKEAWAY



Drytrans continuously removes moisture from transformer oil and helps maintain oil-paper equilibrium, extending transformer life, improving reliability and reducing risk of costly failures.