



DRYOZO

Protects nature
and your business!



Raychem RPG, DryOzo range is our endeavor to protect Mother Earth for climatic change and our environment. Our DryOzo range is range of efficient Dry type Transformers having improved efficiency and tailored to suit any particular application. Customer is also saved in total ownership cost.

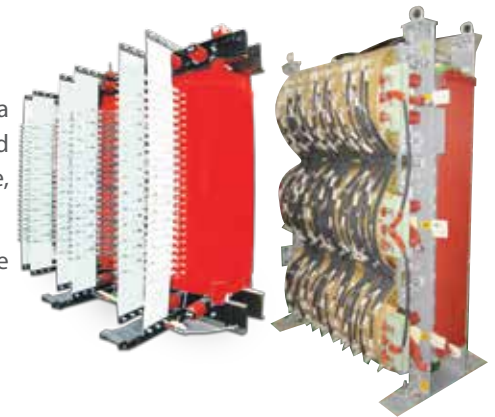
COMPANY PROFILE

Raychem RPG is one of the companies, which in a small journey since 2007, made a significant presence in Transformer industry, offering extensive range of products and service support. Raychem RPG has extensively tested products for Short circuit, Impulse, Temperature rise etc.

Raychem RPG's partial discharge Lab has ambient PD which is less than 1pc. In only one city of India itself, Raychem RPG has installed more than 1000 Dry type transformers.

RAYCHEM RPG IS HAVING MANY TECHNICAL FEATHERS IN THE CAP:

- It is first Transformer Company, which has developed 48 secondary cast resin transformer for International thermo nuclear experimental reactor.
- It is having broadest range of applications, both for Vacuum Pressure Impregnation and Vacuum cast resin Dry Type Transformer suitable for running under extreme environmental condition.



DRY OZO RANGE (OUR ENDEAVOR)

Climate change and depletion of ozone layer is talk of today and the hottest topic threatening existence of living species on earth. Hot air emission from various appliances used, is major threat for today and for coming generations. Conservation of resources is of utmost importance. It is expected of Business community to behave in much responsible manner and produce energy efficient products.

DryOzo products reduce demand of energy generation and resources. Also they protect a consumer from risk of rising prices and same time CO² emission is decreased.

In various global reports it is the established fact that 1kWh of energy saved, reduce 0.54 kg/annum CO² emission.

We at Raychem RPG always strive to develop energy efficient products.

WHY DRY OZO RANGES :

Dry Ozo range is ultra-efficient range and having superior technical characteristic, these are used in variety of application. This range is safe, environment friendly and having life time beyond 25 years

In this range low voltage winding is not casted one but vacuum impregnated so that heat dissipation is fast. High voltage winding is casted to reduce partial discharge and to provide robust and safest construction.

- Can be installed near the place of use, saving installation and cabling cost and reducing losses in low voltage cable
- No risk of pollutants or fire hazardous substance escaping
- Longer life time, due to more durable materials and faster heat dissipation.

- High Mechanical strength for withstanding shocks and vibrations marking it suitable for zones having earth quake sensitive area or area of high short circuit.

DRY OZO FOR ENVIRONMENTAL PROTECTION:

With Raychem RPG advanced design and production technology, we have products offering best quality and dependability. The outages are minimized with our products being used for lighting and energizing Kolkata city. With leading edge technology, we offer products upto 3MVA.

Utilities and Industries used Millions of Transformer distributing power upto 33kV Class.

In Europe more than 5 million of transformers are installed. These transformers cause more than 40Twh losses each year. More than 35 million ton of CO² is emitted .With our Dry Ozo the total CO² emission can be reduced by 30% in total range of 20% to 100% load. These are highly superior products.

Not only energy losses and CO² emissions, the range offers following environmental advantages.

1. Installation area is reduced. Separate room is not required.
2. Extinguishing & protective devices for fire are not required
3. Oil handling /filtration are avoided and power consumed during filtration and emission of gases is avoided.
4. Can be used near load and low voltage cable length is shorter, resulting in reduction of losses.
5. Operating cost is reduced.
6. Heat dissipation to environment is reduced by 30 to 40%, controlling global warming which is biggest concern.

DRY OZO EFFICIENT TRANSFORMERS

Losses are less than 70% of basic.

We have different types of Dry Ozo efficient transformers to suit varied applications of transformers.

Raychem have developed these models in CRGO Grade of material without curving amorphous material of core which is not environment and user friendly and where no load losses increases with life.

Some comparison catalogue show the efficiency more than 99.5% at low load say approx. 20% or say but these products are using amorphous metal. In manufacturing of Amorphous metal more energy and carbon emission is more than CRGO.

Comparison of Life cycle cost of 1MVA Dry Ozo1 w.r.t to basic model is shown below considering energy cost as Rs.5 /unit

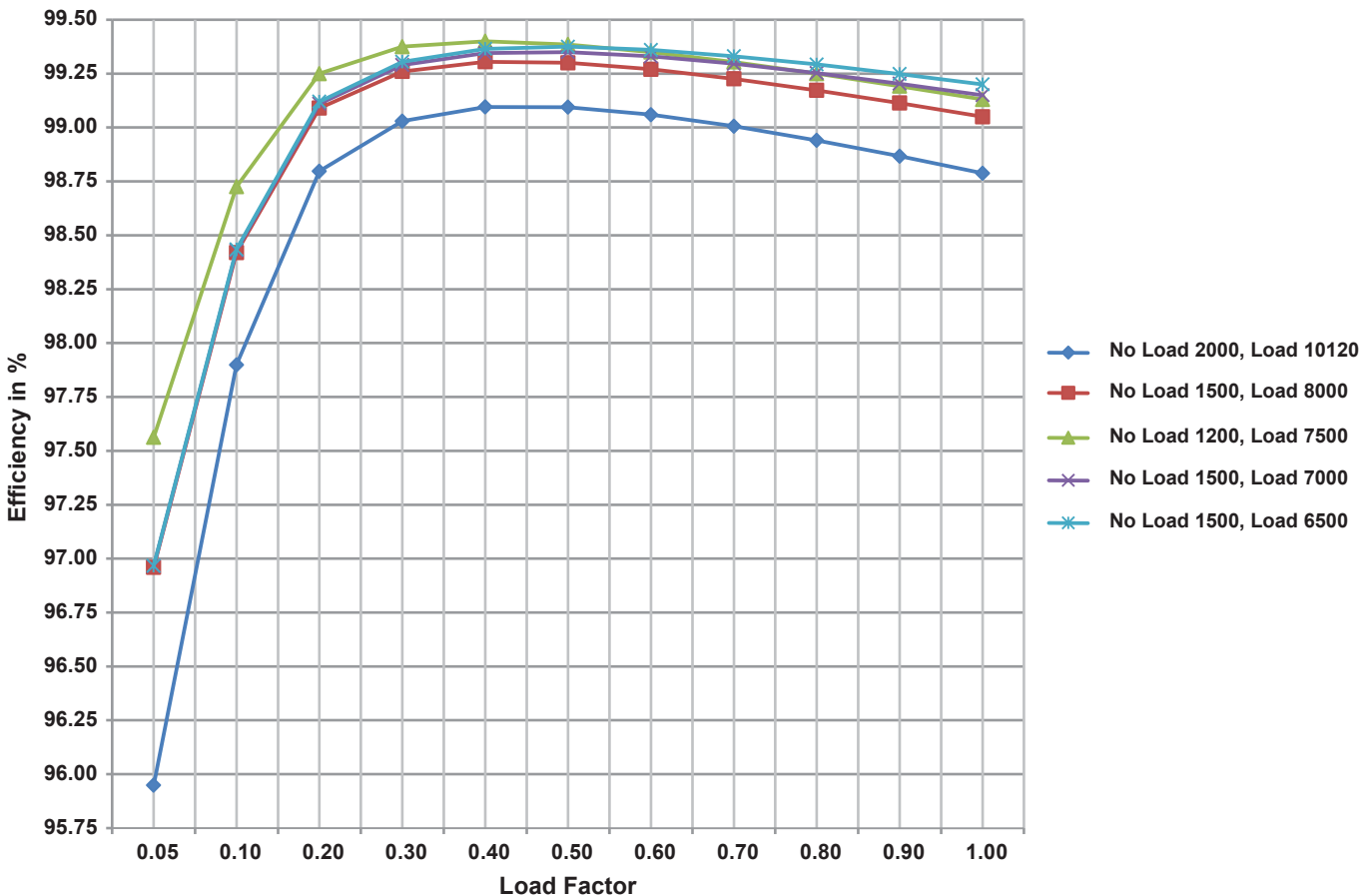
	10 Lakhs Basic	14 Lakhs dryozo1
Purchase Cost	100%	140%
No load loss Cost	219%	131.4%
Load Loss cost assuming at 50% load factor	331.78%	219%
Total	650.78%	490.4%

Savings 160.38% > Purchase Cost.

Losses of our different models are given below

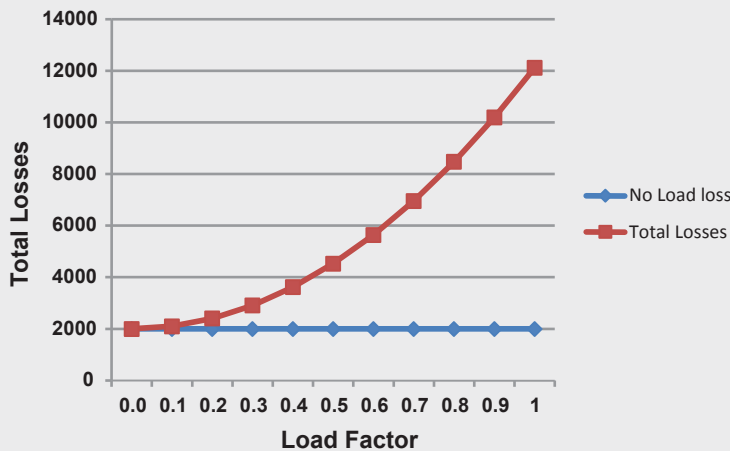
	Basic	Dry Ozo 1	Dry Ozo 2	Dry Ozo 3	Dry Ozo 4
No load losses	2000	1500	1500	1200	1500
Load losses	10120	8000	7000	7500	6500
25%	98.95	99.20	99.23	99.33	99.24
50%	99.09	99.30	99.35	99.39	99.38
75%	98.97	99.20	99.28	99.28	99.31
100%	98.79	99.05	99.15	99.13	99.20

For these different products for different application our efficiency curves are given below



LOSS PROFILE

No load losses are present even if Transformer is not loaded
Load losses: varies with respect to Load.



Losses in transformer depend on loading on the Transformer. At high load, load losses are major losses and more dominant. At no load the no load losses are dominant as they are present even if transformer is not loaded and only energized. From above diagram it is visible how losses are dependent on load.

Load losses \propto (Loading)².

If loading is 80% load losses are $(0.8)^2 = 0.64$ i.e. 64% of total load losses.

No load losses are caused by magnetization of core and by eddy current (surface current) in the core. These occur as soon as transformer is energized. Hence No load losses reduction is important and relevant in lightly loaded transformer.

Load losses called copper losses too, is due to ohmic (I²R) losses and eddy current losses in conductor. They increase with the square of the load. Hence load losses reduction is important and relevant in highly loaded transformer.

We provide solution for the both the cases of load profile. For normal loading or natural loading where transformer is loaded beyond 50% to 60% we have Dry Ozo 2 & 3 as solution. For lightly loaded transformer we have Dry Ozo 1 as solution. Comparison of losses at different load between Dry Ozo 1 and Dry Ozo3 is shown below.

		25%	50%	75%	80%	100%
Dry Ozo1	No Load	1200	1200	1200	1200	1200
	Load	469	1875	4219	4800	7500
	Total	1669	3075	5419	6000	8700
Dry Ozo3	No Load	1500	1500	1500	1500	1500
	Load	406	1625	3654	4160	6500
	Total	1906	3125	5150	5660	8000

If transformer is evenly loaded i.e around 50%, Dry Ozo 2 can be cost effective solution.

Dry Ozo 3 & 4 is the solution for high load reducing transformer losses. Its efficiency from 25 to 100% load is more than 99.2%. Dry Ozo 3 is used to have varied fluctuating loads like Wind power and Solar power. Where wind speed and sun strength may vary considerably in the shorter span of time. Dry Ozo 3 minimizes the load on the grid when there is no wind or atmosphere is cloudy. Dry Ozo4 gives max efficiency at 75% to 100% load and used where the load does not vary and continuous like continuous operating plants.

According to application, by selecting proper product maximum yield can be obtained.

Raychem RPG (P) Ltd.

For detailed information or specific enquiries on Transformers

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