

# Cast Resin Transformers

**Hanley Energy's range of Cast Resin Transformers** have found an ever-increasing scope of application across a myriad of sectors for their **superior build quality and high service reliability**.

**Hanley Energy's cast resin transformers** are dry-type transformers (CEI EN 60076-11) in which the magnetic circuit and windings are not immersed in an insulating liquid but are cast with an epoxy resin mixture.

## 8 reasons to choose Cast Resin Transformers

1. Reduced risk of fire and increased levels of safety.
2. Suitable for indoor use. External applications available on request. Can close couple to main distribution switchgear. (No cabling, bus-coupled)
3. No need for costly civil construction and installation may be closer to critical load.
4. Smaller footprint as the transformer is tall and slim with less instrumentation.
5. Easily retrofitted into commercial buildings.
6. Maintenance free
7. Environmentally friendly.  
Made from 85% recycled materials.
8. Reduced manufacturing time.



**The Casting Process.** The active parts are cast with a resin mixture of quartz flour and epoxy resin after being secured to a mould and preheated under vacuum.

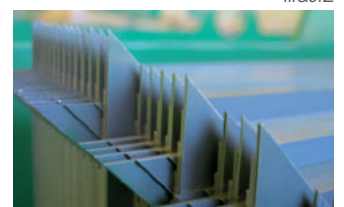
**The Cast Windings.** Divided in many tapes having only one turn for each layer—achieving a higher impulse voltage resistance capability and a lower risk of partial discharge. (*illus. 1*)

**The Insulation.** Class F insulating materials (an epoxy resin pre-impregnated foil that through a heat treatment will match with the secondary conductor). The winding's terminals are TIG welded into the winding all the way through. They are aluminium rigid alloy so give dynamic flexible strength and resistance to condensation and pollution.

**The Magnetic Core.** Highly permeable, low-loss grain-oriented steel sheets with 45 degree step-lap joints (*illus.2*) – designed to minimize stray-flux losses. The surface is also covered by a special paint that protects it against oxidation and corrosion as well as reducing noise.

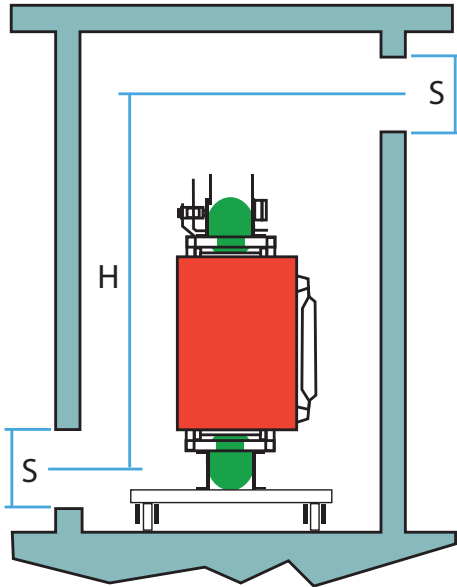


*illus. 1*



*illus.2*

# Cast Resin Transformers



## Cooling

The cast resin transformers are usually cooled with natural cooling by air (AN), though certain cases require the use of fans for cooling with forced air (AF). At all times the ventilation openings must be kept clear to allow the natural dissipation of heat produced from the transformer (Joule effect). Proper cooling is ensured through circulation of natural air, flowing through the transformers surfaces with a natural flow from the bottom to the top. In the transformer room there should be openings at the bottom for the entry of cooling air and at the opposite side of the top for the exit of the thermal loaded air.

S = Open surface (mq)

P = Addition of no load losses and load losses at 120°C (kW)

H = Height of the two open surfaces (m)

## IEC 60076-11 Tested

Our cast resin transformers are designed and manufactured in accordance with the main international standards: CEI EN 50541-1 / IEC 60076-11 / IEC 60076-1 / IEC 60076-2 / IEC 60076-5 / IEC 60076-10 / HD538.1 S1 / HD538.2 S1 / CEI 14-12 and the new Ecodesign legislation: Directive No 548/2014

- Separate source AC withstand voltage test
- Induced AC withstand voltage test
- Measurement of partial discharge test
- Measurement of no-load losses and no-load current
- Measurement of voltage ratio and check of phase displacement
- Measurement of winding resistance
- Measurement of load losses
- Measurement of short-circuit impedance

It is also possible to perform, on request, the following tests:

- Noise level test
- Lightning impulse test
- Temperature rise test

## Certified Quality

We hold prestigious international certificates and approvals in the cast resin technology sector. All our transformers are certified: E3 - E2 - C2 - F1 in Environmental, Climatic and Fire Behaviour classes.

- CESI E3-E2-C2-F1 Certification
- GOST - Russian Certification
- MEDC - Oman Approval
- Sai Gon Utility - Vietnam Approval
- KAHRAMAA - Qatar Approval
- EWA - Bahrain Approval
- ISO 14001 Certification
- ISO 9001 Certification

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