

# THREADED END ANCHORS FOR INDIAN REBARS ( HEAD-T )

An innovative rebar end anchor technology that enables speedy construction with reduced costs

CSIR-SERC has developed an innovative rebar end anchor technology for Indian rebars named as Head-T. The performance of the anchors is evaluated from the individual rebar tests under tension, pullout tests in concrete and implemented in the full-scale beam-column joint tested for both gravity load- and seismic-ductile-designed under reverse cyclic loading. The tension tests show that the designed anchor system can carry upto the maximum strain level which is well above the strain capacity in the reinforced concrete design. Further, the key parameters such as load-displacement hysteresis, energy dissipation, strain development, shear deformation, etc are evaluated and compared with the conventional detailing, by conducting reverse cyclic loading tests on full-scale beam-column joints. The performance of the specimens detailed using Head-T rebar anchor is found to be comparable with the conventionally detailed specimen. Therefore, the technology can be implemented in the full scale structures (both for the normal and seismic designed) to reduce the demand of congested reinforcement and to make the construction process faster.

## FEATURES / HIGHLIGHTS

- Application in reinforced concrete structures for both non seismic and seismic regions
- Design of the anchor done in such a way that both the end plate and collar can take part in load bearing
- The optimum size of the end anchors is attained from strength and feasibility criteria
- Two types of end anchors (square and circular) designed and can be adopted as per the choice of the user
- Head-T for different standard Indian rebar sizes
- The thread geometry is arrived in such a way that least reduction in area is achieved and the grip does not fail before the rod



Head-T rebar end anchors

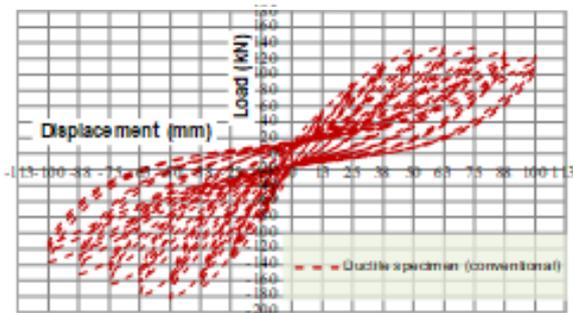
Direct Tension test for rebar anchors

## TECHNICAL DETAILS

- The threaded rebar anchor technology available with CSIR-SERC is mainly developed for Indian reinforcing bars as per IS 1786 (2008) considering the full anchorage capacity using twin-bearing mechanism
- Headed reinforcement, which allows for extremely small development lengths that can reduce congestion without compromising the integrity of the structure results in easier and more efficient design and detailing

# THREADED END ANCHORS

- Performance of the rebar anchors are confirmed by testing full-scale seismic resistant designed beam-column sub-assemblages under reverse cyclic loading
- It is easy to adopt, economical and can be useful for faster construction



Hysteresis behaviour of seismic-ductile designed beam-column joints with rebar end anchors

Hysteresis behaviour of seismic-ductile designed beam-column joints with conventional detailing



## APPLICATIONS

- The threaded end anchors can be used for Indian rebars in reinforced concrete structures
- Enables ease in construction, specifically in the regions with congested reinforcement
- Applicable for both aseismically and seismically designed multi-storey structures
- Applicable for buildings, bridges, dams, foundations, nuclear structures, etc.



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