



DS1/DS2



COOLING SOLUTIONS FOR POWER GENERATION

**YOUNG TOUCHSTONE ...
LEADING THROUGH INNOVATION**

Nearly a century of heat transfer experience has made Young Touchstone the leader in heavy-duty cooling system development and production. Our innovative products and processes have made us the standard by which others are judged in power generation, rail, off-highway, and transit applications.

With over 100 patents and unique manufacturing capabilities, our components and systems have consistently met or exceeded our customers' requirements for performance, quality, delivery, and cost.

Young Touchstone's ISO 9001:2000 certified facilities include extensive R&D, engineering, and lean manufacturing operations that support our pre-configured and custom engineered products.



DS1 and DS2 ... Combining durability and speed.

DS1 was developed to combine the proven *Durability* of Young Touchstone's FLAT-ROUND® mechanical-bond radiators with the production *Speed* of a new modular design system. Our signature FLAT-ROUND radiator core has delivered exceptional performance for decades in the toughest diesel and gas engine cooling applications.

DS1 pre-engineered radiator sub-components can be instantly configured into thousands of combinations for quick proposals and short lead-time deliveries. Young Touchstone's application sizing software quickly optimizes your cooling system solution and configures precisely the radiator you need ... no more, no less. Our modular production system quickly pulls together the needed pre-configured components for your unique cooling system solution, so your units are assembled and shipped in record time. DS1 models include vertical core (VM, VB) and horizontal core (HM, HB) remote-mounted radiators and genset-mounted fan-on-radiator (FR) and fan-on-engine (FE) designs. From 300 kW to 3000 kW, the comprehensive range of DS1 solutions can meet your power gen cooling requirements for durability and speed.

DS2 builds on the success of DS1 by incorporating the latest CuproBraz® heat transfer technology. Young Touchstone's significant investment in CuproBraz development and production pays off for you in the new DS2 system.

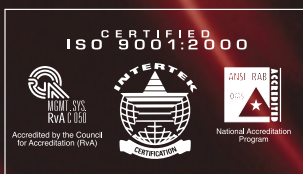
FLAT-ROUND® CuproBraz® Technology ... for stronger, more efficient cooling systems

We've combined the unique FLAT-ROUND mechanical-bond designs and processes (originally developed by Young Touchstone) with the latest CuproBraz technology to produce the toughest, most efficient cooling systems in the industry. Patent-pending designs integrate proven mechanical-bond tube-to-header construction with the superior performance characteristics of brazed copper alloy cores. The result is a system that stands up to years of heavy-duty service.



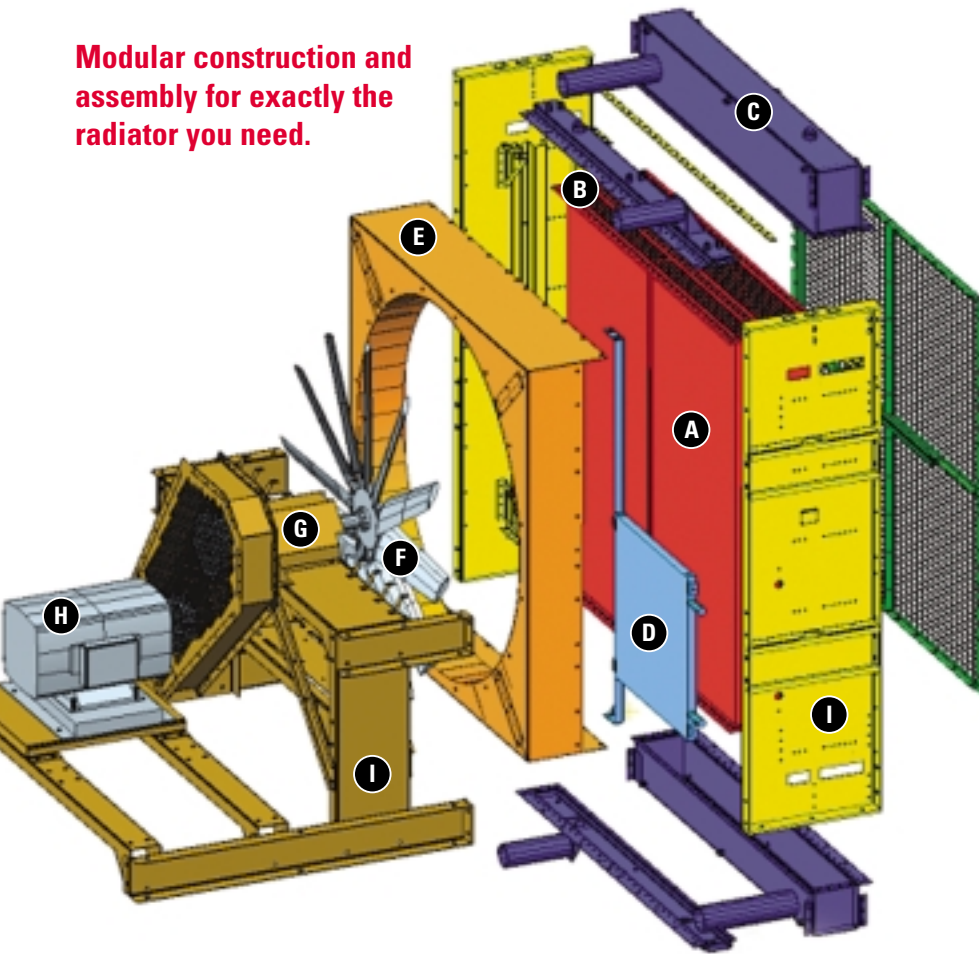
CuproBraz combines high strength copper fins with flat brass tubes to provide heat exchangers that are more durable, compact and efficient than conventional brazed aluminum. With greater thermal conductivity and superior corrosion resistance, compact CuproBraz heat exchangers perform reliably in even the most challenging operating environments.

Young Touchstone's core design and construction incorporates features that provide maximum radiator durability ... especially important in applications where severe thermal stress, excessive shock and vibration, thermal cycling, or high operating pressures up to 60 psi are present.



FLAT-ROUND is a registered trademark of Young Touchstone
CuproBraz is a registered trademark of the International Copper Association Ltd.

Modular construction and assembly for exactly the radiator you need.



- FLAT-ROUND tubing combines the superior airflow and heat transfer of flat tubes with reliable tube-to-header mechanical bonding for exceptional durability.
- Mechanically bonded, roller-expanded tube-to-header joint prevents coolant leaks because there's no solder to corrode or crack, no braze to fatigue, no rubber grommets to replace.
- Half-inch thick steel header plate with machined o-ring tank seal provides incredible rigidity and strength and additional protection against coolant leaks.
- Heavy-wall brass tubing provides strength and damage resistance. With our welded seam construction, there are no soldered lockseams to corrode or leak.
- DS1 cores use flat copper plate fins soldered to brass tubes for maximum core strength in prime power and CHP applications.
- DS2 cores use louvered serpentine fins brazed to brass tubes with CuproBraz technology for highly efficient cooling and lowest cost in standby applications.

Young Touchstone has developed unique processes for machining header holes and o-ring grooves, transforming tubes from flat to round, annealing and sizing tubes, and mechanically bonding tubes into headers for superior quality using Wabtec's lean manufacturing principles. Our CuproBraz furnace and manufacturing capabilities can handle core sizes for virtually any power generation cooling requirement.

- A — Durable FLAT-ROUND mechanical-bond core.** Our signature core provides leak-free radiators and air-to-air charge air cooling in even the most punishing diesel and gas engine cooling applications. Single and dual core designs, in side-by-side and front-to-back arrangements, can be configured with various tube row and fin densities for optimal performance and lowest cost.
- B — Reliable o-ring tank seals.** Exclusive o-ring tank flange seal eliminates leaks due to gasket failure.
- C — Engine-specific tank designs.** Coolant connection types, locations, and sizes are specified for the most common engines in power generation service. Coolant operating pressure, expansion volume, drawdown volume, deaeration, filling, and venting requirements meet each engine manufacturer's specific requirements.
- D — Diesel fuel cooler.** Innovative packaging incorporates fuel cooler inside fan shroud box with no additional space requirements.
- E — Optimized shroud box.** Deep plenums, close fit fan rings, and large fan openings maximize airflow distribution across radiator core.
- F — High efficiency fans.** Airfoil fan blades deliver maximum cooling airflow with minimal horsepower requirements. Fans can be configured for "Quiet" and "Extra Quiet" sound levels or additional static air restrictions for specific site conditions.
- G — Long-life bearings.** Taper lock roller bearings with contact seals provide trouble-free operation and long L10 life.
- H — Wide range of electric motors.** Three-phase motors for any voltage or duty can be configured for electrical requirements anywhere in the world.
- I — Heavy-duty framework.** Through Finite Element Analysis (FEA) and testing, our heavy gauge steel framework minimizes fan drive vibration. Frame options for Seismic Zone 4 and 150-mph hurricane wind load requirements are available.

All DS1 and DS2 radiators are protected from the elements by a powder coat paint finish. For severe environments such as coastal or landfill applications, galvanized frames and Heresite® coated cores may be specified. Grade 8 premium hardware is used to secure components. Yellow zinc dichromate finish keeps all wire fan guards, bolts, washers and nuts rust free.

Supplemental Expansion Deaeration and Drawdown (SEDD) tanks are available to meet coolant volume requirements of any installation.

DS1 and DS2 configurations



FE

vertical core
skid mount
fan-on-engine
4 sq. ft. to
73 sq. ft. core
face areas

VM

vertical core
remote mount
motor-driven fan
4 sq. ft. to
19 sq. ft. core
face areas

HM

horizontal core
remote mount
motor-driven fan
4 sq. ft. to
19 sq. ft. core
face areas

FR

Vertical core
skid mount
fan-on-radiator
12 sq. ft. to
94 sq. ft. core
face areas

VB

vertical core
remote mount
motor-driven fan
24 sq. ft. to
115 sq. ft. core
face areas

HB

Horizontal core
remote mount
motor-driven fan
24 sq. ft. to
115 sq. ft. core
face areas