



ENGINEERING CONNECTIONS EVERYDAY





WHO WE ARE

OUR COMPANY

Established in 1974, Fluid Controls® is a leading provider of instrumentation products and services for a wide variety of industrial applications. Headquartered in Mumbai, India, the group has manufacturing facilities in Pune and Goa, including a state-of-the-art R&D centre and testing laboratory.

OUR RAILWAY HERITAGE

Fluid Controls® has over 40 years of experience in engineering connections for rail and metro brake piping assemblies. We offer customers total solutions for locomotive and coach brake piping arrangements – from design & engineering services to supply of high performance connectors and installation services.

OUR CUSTOMERS

Millions of Fluid Controls® connectors have been successfully installed on electric and diesel locomotives, motorized coaches, LHB and mainline coaches and metro cars. We are approved by the Indian Railways, Bombardier Transportation, GE Transport, and Alstom; and we also supply to Knorr-Bremse, Faiveley and other rail and metro system providers.



WE ENGINEER CONNECTIONS



OUR DESIGN SOLUTIONS

Fluid Controls® offers design services for brake piping arrangements and conversion engineering, including 3D modelling, FEA and prototyping. Our engineers work closely with customers to understand their requirements and develop effective solutions for them. Fluid Controls® is recognised as an “In-house R&D Unit” by the Government of India under the aegis of the Department of Scientific & Industrial Research (DSIR).

OUR RANGE OF PRODUCTS

We are a [single source supplier](#) for various connectors required for rail and metro applications. Our products include Double Ferrule Fittings, DIN Single Ferrule Connectors, Threaded Adaptors, Across Frame Connectors™, FlexiGrip™ Connectors, and Quick Release Connectors. We also provide Isolating Cocks and a range of clamping accessories (DIN and customised) for rail and metro brake pipe lines. Fluid Controls® connectors are manufactured to the highest standards and our ferrule fittings are design validated and certified ASTM F1387-99, ISO 19879, and ISO 8434. We are also certified to IEC vibration and corrosion resistance standards.

OUR APPLICATION SERVICES

As an extension of our design and supply services, Fluid Controls® offers clients on-site and off-site installation services of brake piping. Our services include tube formation, connector fitment and mounting of piping. Fluid Controls® has recently introduced pre-piped assemblies to facilitate installation and ensure faster turnarounds.

OUR CUSTOMERS

Alstom Transport India

Bombardier Transportation

Bharat Earth Movers Limited

Bharat Heavy Electricals Limited

Chittaranjan Locomotives Works

Diesel Locomotives

Diesel Modernisation Works

Wabtec – Faiveley Transport

GE Transportation – Rail

Indian Railways – Zonal

Integral Coach Factory

Knorr Bremse India

Modern Coach Factory

OVER 10 MILLION INSTALLATIONS

Electric Locomotives

Diesel Locomotives

Metro Rail Coaches

EMU Coaches

LHB Coaches

Equipment Integrators



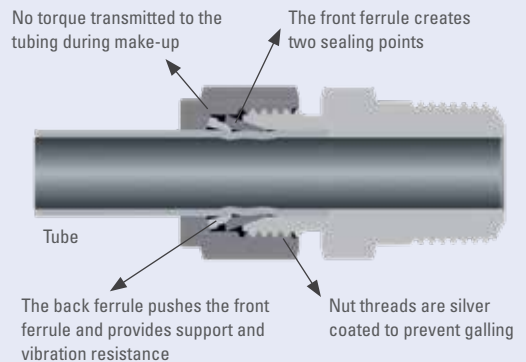
OUR CORE PRODUCTS

DOUBLE FERRULE CONNECTORS

- Twin Ferrule Connectors which provide multiple sealing points and high resistance to vibration
- Design approved by ABS and performance certified to ASTM F1387 and ISO 15500
- Comply with BS EN 61373 shock and vibration norms
- Corrosion resistance to IEC 60068
- Sizes upto 2" / 42mm, working pressure as per ASME B31.3, materials to customer requirement



- Two ferrules grasp the tube tightly with no damage to the tube wall
(How? Because all the action in the fitting is by an axial movement along the tube instead of a rotary motion to create a joint)
- Since no torque is transmitted from the fitting to the tubing, there is no initial strain which might weaken the tubing

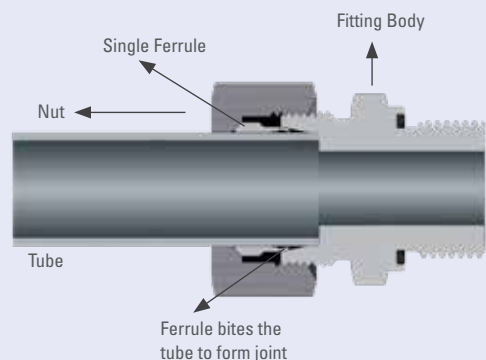


DIN SINGLE FERRULE CONNECTORS

- Specially designed single or double cutting rings, hardened by a proprietary process
- Designs include 24° & 37° cone, o-ring face seal, weld nipple connectors
- Designed to DIN 2353 / DIN 3861 / DIN 3859 / ISO 8434
- Performance certified to ISO 19879 / ISO 8434-5
- Available in LL, L and S series
- Sizes and materials to customer specifications



- A single ferrule bites into the tube to create a joint ("bite type fittings")
- Two types of ferrules:
 - Single bite type
 - Double bite type(All "S" Series are double bite type)



OUR PRODUCTS: CONNECTORS

THREADED ADAPTORS

- Provide reliable sealing for tubing and piping installations
- High-quality finish, capped protection threads and NPT, ISO/BSP and SAE thread connections
- Available in Stainless Steel, Brass and Carbon Steel



ACROSS FRAME CONNECTORS™

- Custom designed double ferrule combination fittings to connect pipelines separated by a panel
- Bulkhead application at one end and a swiveling action at the other end for orientation and height adjustment
- Can be used to join pipelines of different material
- Easy to install and eliminate welding processes
- End connections are tested and validated to ASTM F1387 standards
- Available in Stainless Steel, Carbon Steel and Brass



FLEXIGRIP™ CONNECTORS

- For connections between mis-aligned pipes or between pipes of different materials
- Triple sealing action of the split ring, washer and O-ring
- The split ring provides superior vibration resistance
- Easy to assemble and offer "Make & Break" re-usability
- Available in SS, CS, Aluminium with sizes up to 2" / 60.3mm



QUICK RELEASE CONNECTORS

- Easy connection and disconnection by hand with zero leakage & no spillage at high working pressures
- Designed to ISO and DIN standards
- High reliability for repetitive operations, quick change operations and for in-line operations



OUR PRODUCTS: VALVES & CLAMPS

RAILWAY ISOLATING VALVES

- Range of high performance ball valves
- Available with a vented option at the outlet end
- Design approved by ABS
- Pressure performance to 400kg/cm², temperatures upto 180°C
- Available in sizes 6mm to 42mm and 1/4" to 1"
- Standard design with RPTFE or Delrin Seat with a soft handle operation
- End connection options – threaded, single ferrule, twin ferrule, weld nipple



CUSTOMIZED CLEATS

- Cleats customized to client requirements
- Offered in Polypropylene and Polyamide
- Designed to provide support for high vibration environments
- Available for fractional and metric pipes/tubes

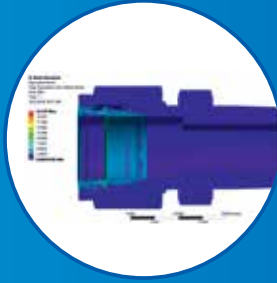
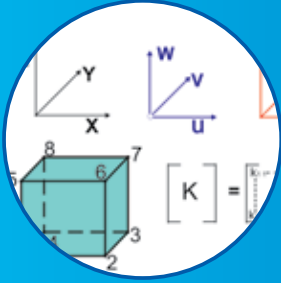


DIN CLAMPS

- Standard duty designs as per DIN 3015-1, heavy duty designs as per DIN 3015-2 and twin series designs as per DIN 3015-3
- Customised clamps available for special applications
- TUV design validation to DIN 3015 standards
- Available for fractional and metric pipes / tubes
- Clamp materials offered are Polyamide, Polypropylene and Aluminum with trim in CS or SS
- Mounting options include weld-mounting, rail-mounting, and stacking



OUR DESIGN SOLUTIONS



**ANALYTICAL
FORMULATIONS /
FIRST PRINCIPLES**

**IN-HOUSE
2D & 3D
MODELING**

**FINITE ELEMENT
MODELING
& ANALYSIS**

**MANUFACTURING
& TESTING AT OUR
FACILITIES**

3D MODELING AND ANSYS ANALYSIS

- Studies for in-place systems or for comparing systems
- In-depth FEA studies covering vibration impact, reliability, life estimation and energy absorption of connectors

CONVERSION ENGINEERING

- Design and engineering support if brake piping systems are being converted from one connector system to another
- Support includes on-site visits, conversion of standard connectors and estimation of piping lengths and requirements, and designing of special connectors and prototyping

CONNECTOR CUSTOMISATION

- Design of special solutions for specific customer requirements
- For example, Across Frame Connectors™ were designed by Fluid Controls® for electric locomotives to reduce welding operations, thus saving time and cost

Fluid Controls® uses "Design for Six Sigma" as a platform for Product development:

Tools include Solidworks, Ansys, AutoCad, HyperMesh, PDMS software

OUR INSTALLATION SERVICES

INSTALLATION SERVICES

On-site Swaging Services

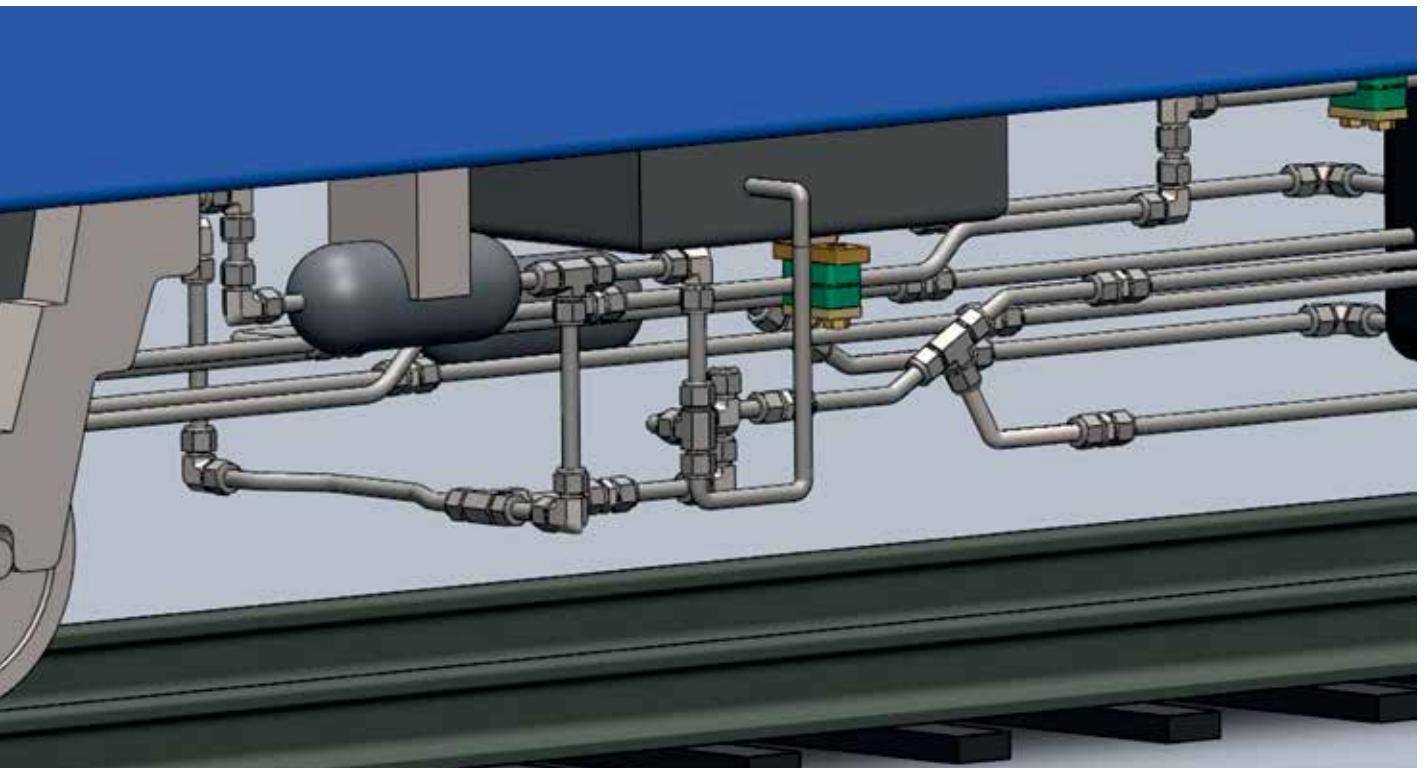
- Cut/Bent tubes and connectors provided by customer
- Fluid Controls® resident team provides swaging services for each connection
- Expert swaging ensures proper fitment of ferrules and performance of the connection

Total Piping Installation Services

- Services include supply, on-site tube cutting and bending, fitment of connectors and installation on the underframe

PRE-PIPED ASSEMBLIES

- Engineering support during designing of the piping layout
- 3D modeling and analysis
- Tube cutting and bending at our facility
- End connector installation / swaging at our facility
- On-site fitment of sub-assemblies if required



SYSTEM & PERFORMANCE CERTIFICATES



ISO 9001-2015, ISO 14001, OHSAS ISO 18001

Certified "In-house R&D Unit" by the Department of Scientific Research,
Govt. of India

American Bureau of Shipping : Design Assessment Certificate
for Connectors, Valves, Manifolds

TUV PDA for DIN Connectors

ASTM F1387-99 (2012) for SS and Brass Connectors

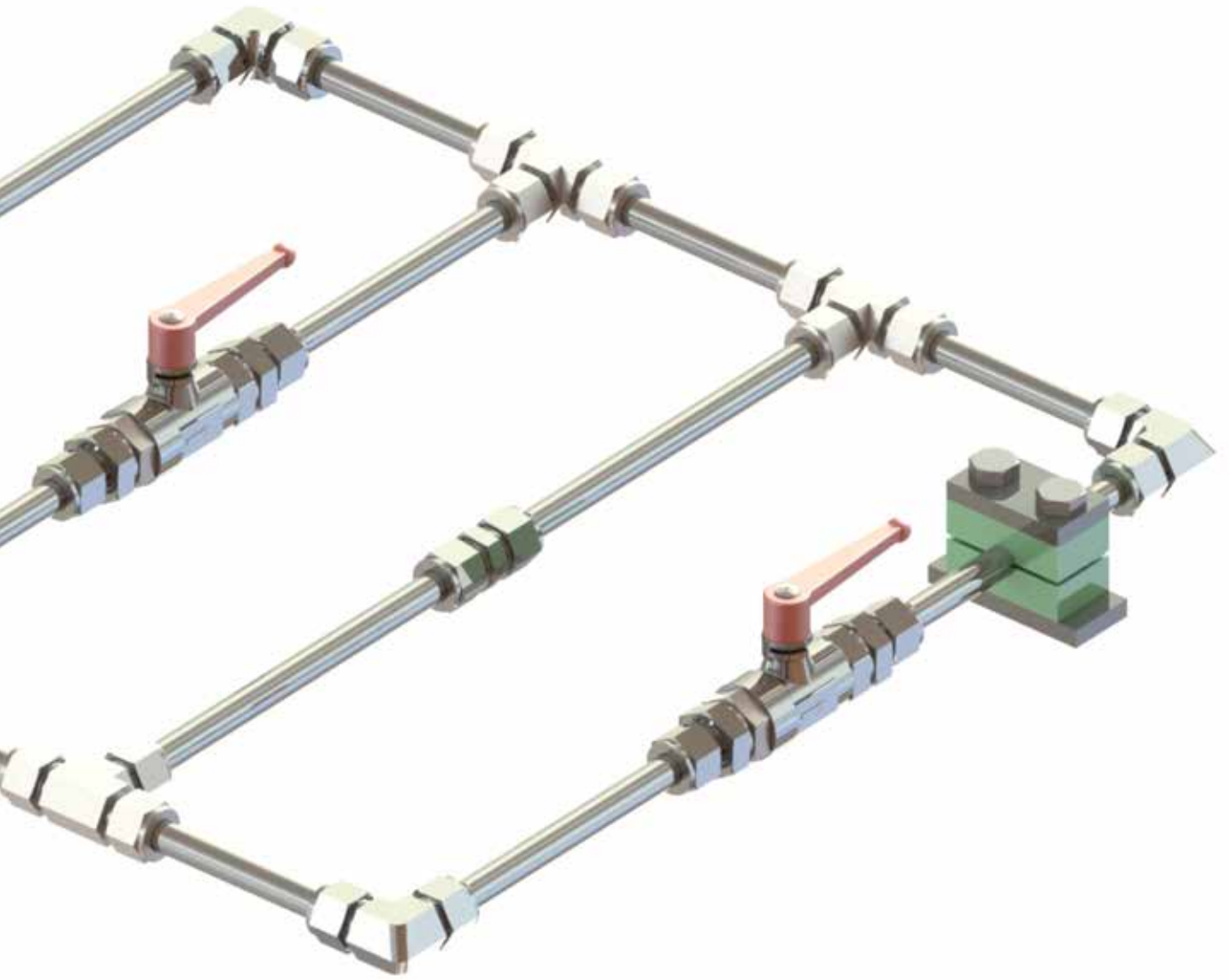
ISO 19879 for DIN Connectors

ISO 15500 / NGV / ECER110 certification

Connectors certified to BS EN 61373 (Shock and Vibration),
IEC 60068-2-52 (Salt Mist) and Helium Leak Test to 10^{-11} Std.cc/sec

Valves certified to MSS-SP-99, Fugitive Emission (API 622 / ISO 15848),
and API 607 / ISO 10497 (Fire Safe)

Clamp Design Appraisal Document as per DIN 3015



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