

METALWORKING

# DEFORMATION

YOUR ADVANTAGE IN AN INDUSTRIAL WORLD



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# THE EXPERTS IN DEFORMATION TECHNOLOGY

**CASTROL OFFERS YOU A COMPREHENSIVE RANGE OF WORLD-CLASS FORMING FLUIDS AND PRODUCT SUPPORT SERVICES THAT WILL HELP YOU TO:**

- > **Enhance component quality**
- > **Improve Health, Safety and Environmental (HSE) performance**
- > **Increase your productivity**
- > **Reduce your process costs**

We can offer you these powerful benefits by harnessing the process and applications expertise of our global network of engineering and research specialists. This know-how is then delivered directly to you by our knowledgeable local sales and support teams.

Our ultimate goal is to increase your manufacturing quality standards – and help you meet your HSE responsibilities.

It's clear that metal forming has become increasingly important compared to metal removal technologies, especially when higher efficiency can be achieved by reducing manufacturing steps or lowering scrap rates.

At Castrol, we focus on developing compatible metal forming process solutions. This has resulted in a wide range of forming fluids and, as importantly, proven knowledge and experience in their application in various industries.

Simply put, you can trust Castrol to provide the right product for the job, across all your operations.

## A CHOICE TO SUIT ALL NEEDS

We offer you an innovative, comprehensive and high performing metal forming product range under the Castrol Iloform brand – along with the technical expertise to support our products globally.

As experts in deformation technology, our sales team will work with you to select the right products for your operations, taking the following important factors into account:

- Your forming process – speed, reductions, severity of forming operation
- Equipment – tooling, tonnage, system size and design
- Compatibility with your entire process, including other process fluids
- Material specifications – size, substrate, thickness, hardness
- Surface finish requirements
- Local legislation
- Waste treatment

Our portfolio of forming fluids covers a wide range of user and environmentally responsible products. These are grouped according to their main area of application:

- **Sheet metal stamping**
- **Deep drawing and tube drawing**
- **Wire drawing and cold heading**
- **Fineblanking**
- **Hydroforming**
- **Welded tube rolling**

The Castrol Iloform range of products includes all of the following technologies:

- Neat oils
- Soluble oils
- Synthetics
- Pastes
- Hot melts

# FORMING FLUIDS THAT GIVE YOU THE ADVANTAGE

## SHEET METAL STAMPING

### Process features

- Allows production of parts with fine finish and high accuracy
- Production of complex components can be achieved by setting up a press tool to carry out a number of forming operations simultaneously or in sequence
- Lower cost manufacturing process achievable
- Press tooling can be changed relatively quickly to produce different parts

### Typical parts

- Automotive body panels
- Electric motor laminations
- Air conditioner and refrigerator cooling fins
- Computer components, drives and cases
- Electrical switch gear and circuitry connections
- Locks, hinges
- Metal casings for white goods and electrical equipment

### Castrol Iloform benefits

- Enhanced tool and die life cuts downtime and tooling costs
- Full compatibility with every stage of the process reduces scrap rates and reworking costs
- Improved, cleaner working environment supports worker acceptance and lowers maintenance costs

## DEEP DRAWING AND TUBE DRAWING

### Process features

- Components with high deformation severity/high reductions can be produced
- Complex components can be manufactured by deep drawing through the use of progressive dies
- Tube drawing produces tubes with higher strength and accuracy compared to tube welding

### Typical parts

- Tube for high temperature, pressure and corrosive environments, used in the power generation, petrochemical, oil, gas and mechanical engineering industries
- Automotive engine sumps and covers, bumper sections, exhaust components, petrol/oil filters
- Kitchenware, pots, saucepans, pressure cookers, trays
- Cosmetic bottles, lipstick holders, aerosol cans
- Seat assemblies, suspension and steering parts
- Battery casings

### Castrol Iloform benefits

- High-performance products allow improved end product quality and lower tooling costs
- Full compatibility with every stage of the process reduces scrap rates and reworking costs
- Improved, cleaner working environment supports worker acceptance and lowers maintenance costs

## WIRE DRAWING AND COLD HEADING

### Process features

- High speed, high throughput processes
- Several forming stages accomplished in one machine, through the use of multiple dies
- Cold heading produces parts that require minimal finishing, reducing costly secondary machining operations
- Cold heading produces parts with much higher strength compared to machining

### Typical parts

- Electrical cable and wire
- Welding wire
- Wire cables and ropes
- Wire meshes, wire fencing
- Automotive body and chassis assembly fasteners, under bonnet mount clips and brackets, car interior clips
- Construction and building fasteners
- Equipment assembly fasteners, nuts, bolts, brackets, etc.

### Castrol Iloform benefits

- High-performance products enable improved end product quality and lower tooling costs
- Stable, long-life products reduce lubricant usage and downtime costs
- Safe products minimise risks associated with lubricant mists, smoke and fumes – enhancing operator acceptance

## FINEBLANKING

### Process features

- Provides cleanly sheared straight edges, with little or no diebreak
- Eliminates costly multi stage machining
- Achieves excellent flatness and dimensional accuracy
- Forms in two dimensions
- Relies on rolled stock strength
- Enables higher design freedom

### Typical parts

- Seat recliners, friction discs, brake operating levers, sprocket wheel, gear primary helical, engine plates, latch starter gears, sector gears, valve spring discs, clutch drive discs, speed change levers, washers, various cam, brake pad plates, struts, rim/web brake shoes cover plates, tooth discs, butting rings and stopper plates
- Disc drives, printers, plotters, heat sinks
- Lawn and garden equipment, power tools, locks

### Castrol Iloform benefits

- Enhanced tool and die life cuts downtime and tooling costs
- Excellent resistance to pressure and high protection against wear assure best forming results, even on difficult geometries
- Superior adhesion enables homogenous lubricating film and improves parts quality
- Improved working environment supports operator acceptance

## HYDROFORMING

### Process features

- Allows production of high strength, low weight components
- Reduces material waste
- Reduces costly secondary process operations
- Enables complex design geometries to be produced

### Typical parts

- Automotive chassis components, side rails, cross members, engine cradles
- Aircraft and aerospace components
- Faucets, plumbing fixtures and fittings
- Door and appliance handles
- Furniture frames

### Castrol Iloform benefits

- Excellent process fluid compatibility at all process stages
- Excellent stability and resistance to microbes, water hardness build-up and tramp oils mean high cleanliness and filterability
- High-performance products for bending and forming enable improved end product quality and lower tooling costs

## WELDED TUBE ROLLING

### Process features

- Cost effective, high-speed continuous process
- Allows in-line coating of tubes e.g. galvanised, aluminised
- Allows in-line coating of rust preventives
- Minimises residual stresses during roll forming operations
- Different tube materials can be processed on the same mill

### Typical parts

- Structural tubes – building materials, gas/oil pipe, heavy equipment
- Mechanical tubes – automotive and engineering applications, decorative, furniture
- Coated – outdoor building applications, fencing, furniture
- Miscellaneous – decorative, food preparation, appliance manufacturing

### Castrol Iloform benefits

- Increased cleanliness ensures excellent surface finish and process control
- Increased sump life through high stability and resistance to microbes, water hardness build-up, chlorides, tramp oils and mill scale build-up
- Excellent rust protection means lower mill maintenance costs and improved end product quality

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