

TATA STEEL



Cold-rolled DP800-GI HyperForm®

Higher performance – lower total cost of ownership



DEVELOPED TO MEET YOUR NEEDS

Innovative DP800-GI HyperForm is an advanced high-strength steel made by Tata Steel and designed to meet the exacting needs of the automotive industry. It combines the strength of DP800 steel with the formability of DP600 – without compromising weldability. Thanks to its excellent properties, DP800-GI HyperForm offers a variety of benefits to automotive engineers and OEM's: greater design flexibility with improved press/weld shop performance, resulting in a lower total cost of ownership (TCO).

DP800-GI HyperForm at a glance:

- Advanced high-strength steel
- Excellent formability
- Good weldability
- Enables higher processing yields
- Replaces more expensive steels
- Lowers TCO

Higher performance – Lower TCO

Working in close cooperation with leading automotive OEM's, we developed DP800-GI HyperForm and aligned the material's performance with the needs of the automotive industry. The steel has been available since 2010 and has been included in the VDA 239-100 norm under the name CR440Y780T-DH.

High strength with improved formability

DP800-GI HyperForm is specifically developed for use in lightweight, crash-resistant automotive parts, including structural members and reinforcements. With a minimum tensile strength of 780 MPa, the steel offers the same strength level as a conventional DP800 grade. The difference is that this steel offers extra ductility for improved formability. This makes it ideal for stamping parts in complex shapes.

More design flexibility for complex parts

Thanks to its outstanding formability, DP800-GI HyperForm gives vehicle engineers more freedom when it comes to designing complex parts. This is due to a higher elongation (A_{80} min. 18%) and n-value (min. 0.14) and an improved forming limit curve compared to standard DP800. In the search for smarter and lighter crash structural members engineers find DP800-GI HyperForm a great enabler for part consolidation and downgauging.

Improved formability for higher press shop yield

The advanced mechanical properties of this steel also offer a solution for difficult-to-press parts (high yield loss) when replacing standard DP800 with DP800-GI HyperForm. The improved formability results in better press shop performance and lower TCO.

Better crash performance – Less weight

To analyse the crash performance properties of DP800-GI HyperForm, drop weight testing with closed top hat structures was carried out to check the fracture behaviour. The performance was similar to standard DP800 with an approx. 10% increase in energy absorption compared to DP600. This results in a potential 10% thickness reduction compared to DP600 without sacrificing crash performance.

Mechanical properties

Grade	Specification	Test direction	Yield strength R_p (MPa)	Tensile strength R_m (MPa)	Elongation A_{80} (%) min	n-value min	r-value min	BH ₂ min (MPa)
CR DP800-GI HyperForm	Tata Steel specification	L or T	450-550	780-900	18	0.13	0.6	35
CR440Y780T-DH	Tata Steel typical	T	485	823	20	0.162	0.88	52
		L	471	820	21	0.165	0.66	48
CR440Y780T-DH	VDA 239	L	440-550	780-900	18	0.13	-	30

Better weldability for lower TCO

Another advantage is the excellent welding performance of DP800-GI HyperForm. Its weldability is equivalent to that of DP800 and better than TRIP800 due to a combination of relatively low carbon, phosphorous and sulphur content. Thanks to the controlled alloy additions, a typical weld window of 1.3kA is achieved using the VDEh welding procedure (SEP1220-2).

Galvanised coating for cost effective corrosion protection

DP800-GI HyperForm is coated using a conventional hot-dip galvanising process and is therefore a more affordable solution compared to electrogalvanised products.

Customer trials confirm performance

Through working in partnership with our customers, DP800-GI HyperForm has been positively evaluated on its mechanical properties as well as on TCO. A number of OEM's have successfully implemented this steel on different applications, such as bumper beams and A-pillar- and sill reinforcements.

Material data and support in application

For detailed information on the properties please refer to Aurora® Online. Our online database contains comprehensive up to date material files, data sheets and ready to run input decks on our automotive steel grades.

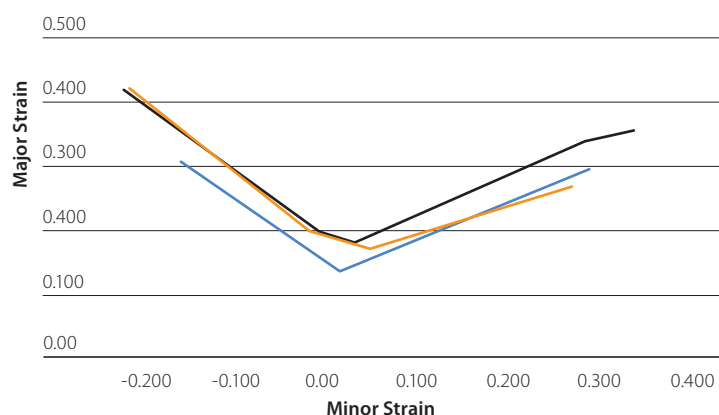
Our material experts are there to support the deployment of DP800-GI HyperForm in your specific application area.

For more information (also for access to Aurora Online):

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Forming limit diagram DP800-GI HyperForm

In comparison with DP800-GI and DP600-GI



Key

- DP600-GI
- DP800-GI HyperForm
- DP800-GI

The FLC analysis shows that DP800HyperForm formability is similar to DP600 and higher than standard DP800.

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