

## Hot-rolled FB590

### High strength, high ductility and high formability

Hot-rolled FB590 is a ferrite-bainite high strength steel (AHSS), designed to offer high strength, ductility, and formability. This steel can be used in automotive chassis and suspension applications, such as, upper and lower control arms, engine sub-frames and road wheels (specifically wheel discs) where a high strength highly formable material is required.

FB590 offers a high hole expansion coefficient in combination with a high tensile strength where components have a significant amount of edge stretching. Another benefit is that this hot-rolled steel offers excellent fatigue resistance in relation to the high tensile strength. Substitution of standard grades with FB590 provides opportunities to reduce thickness whilst maintaining the in-service performance and potential cost and weight savings.

Tata Steel can advise you with regard to forming and welding when switching to FB590 or designing new components with this material.

#### Mechanical properties

| Grade                                 | Test direction | Yield strength          | Tensile strength     | Elongation              |
|---------------------------------------|----------------|-------------------------|----------------------|-------------------------|
|                                       |                | R <sub>p0.2</sub> (MPa) | R <sub>m</sub> (MPa) | A <sub>80</sub> (%) min |
| VDA 239: HR440Y580T-FB                | L              | 480                     | 580 - 700            | ≥15                     |
| EN 10338: HDT580F                     | L              | 440-600                 | ≥580                 | ≥15                     |
| Typical Tata Steel product properties | L              | 490                     | 595                  | 20                      |
|                                       | T              | 530                     | 600                  | 18                      |

Hole Expansion Co-efficient values can be supplied on request but not as part of the production release test.

#### Chemical composition

|                               | C     | Si    | Mn   | P      | S     | Al <sub>tot</sub> | Cr+Mo | Nb+Ti | V     | B     |
|-------------------------------|-------|-------|------|--------|-------|-------------------|-------|-------|-------|-------|
| VDA 239: HR440Y580T-FB        | ≤0.12 | ≤0.50 | ≤1.6 | ≤0.025 | ≤0.01 | 0.015             |       | 0.05  |       |       |
| EN 10338: HDT580F             | 0.18  | 0.50  | 2.00 | 0.050  | 0.010 | 0.015 to 2.0      | 1,00  | 0.15  | 0.15  | 0.01  |
| Tata Steel product properties | 0.085 | 0.25  | 1.40 | 0.018  | 0.003 | 0.04              | 0.05  | 0.05  | 0.001 | 0.001 |

Values provided in mass percentages

#### Dimensional window of Hot-rolled FB590

| Thickness (mm) |       | Width (mm) |      |      |      |      |
|----------------|-------|------------|------|------|------|------|
|                |       | 900        | 1001 | 1101 | 1201 | 1301 |
|                |       | 1000       | 1100 | 1200 | 1300 | 1400 |
| 1.800          | 1.899 | ●          | ●    |      |      |      |
| 1.900          | 1.999 | ●          | ●    | ●    |      |      |
| 2.000          | 2.500 | ●          | ●    | ●    | ○    |      |
| 2.501          | 3.000 | ●          | ●    | ●    | ●    | ○    |
| 3.001          | 3.500 | ●          | ●    | ●    | ●    | ○    |
| 3.501          | 4.000 | ●          | ●    | ●    | ●    | ○    |
| 4.001          | 4.500 | ●          | ●    | ●    | ●    | ●    |
| 4.501          | 5.000 | ●          | ●    | ●    | ●    | ●    |

● Available ○ Under development

Please refer to Tata Steel or your local sales representative for dimensions which fall outside of the above matrix.

Our material experts are there to support the deployment of FB590 in your specific application area. Our online material database Aurora Online can provide our customers with comprehensive data sheets and ready to run input decks.

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

connect.automotive@tatasteel.com  
[www.tatasteel.com/aurora](http://www.tatasteel.com/aurora)



[www.tatasteeleurope.com](http://www.tatasteeleurope.com)

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