Automotive steels – Improving performance, properties, forming and the future

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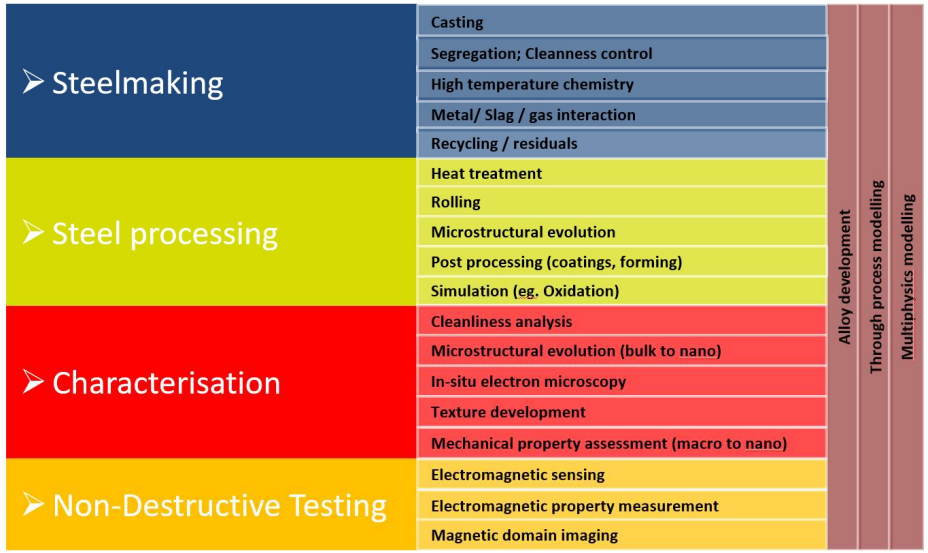
Advanced Steels Research Centre

- Start to finish steel production, processing and prototyping
- Industrial simulation – annealing, rolling
- Microstructural characterisation and testing
- Non-destructive testing – EM measurement material properties
- Forming and joining



Automotive Steel Development

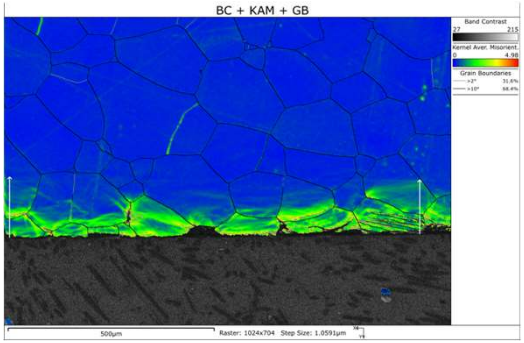
Source: Automotive Manufacturing Solutions

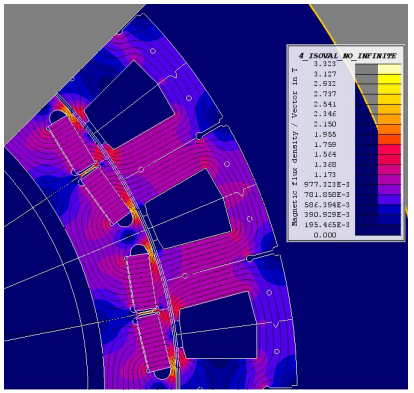
- Better material properties - formability, mass reduction, strength
- Improved performance at a microstructural level
  - Alloying / microalloying
  - Cleanliness
  - Texture
- Mild, ultra-low carbon, advanced and ultra high strength steels

Electrical Steel Development

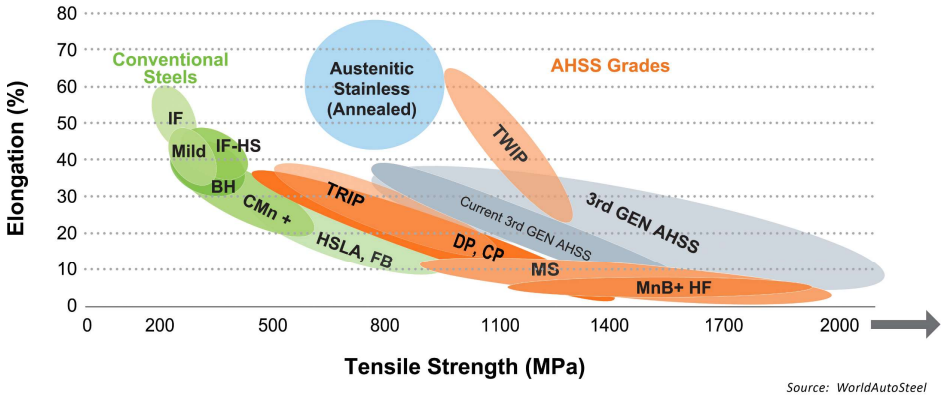
- Electrification of drive trains
- Improving electrical steels for motors and generators
- Through process analysis
  - Texture evolution
  - Grain size development
  - Silicon addition
- Manufacturing processes and electromagnetic performance

Source: Wonderful Engineering





Next Generation Steels



- Next generation ultra-high strength steels (yield strength > 1250MPa)
- High wear / abrasion resistance
- Impact protection, low packaging space
- Improving, understanding formability and joinability
- Finding the right automotive structural applications

Metal Forming / Testing Capability

- Small scale strip rolling
- Sheet metal formability testing
  - Draw bead simulation
  - Hot forming (900^{o}C)
  - Forming limit curve determination using 3D imaging
- High strain rate testing (crash)
- Software simulation of all processes