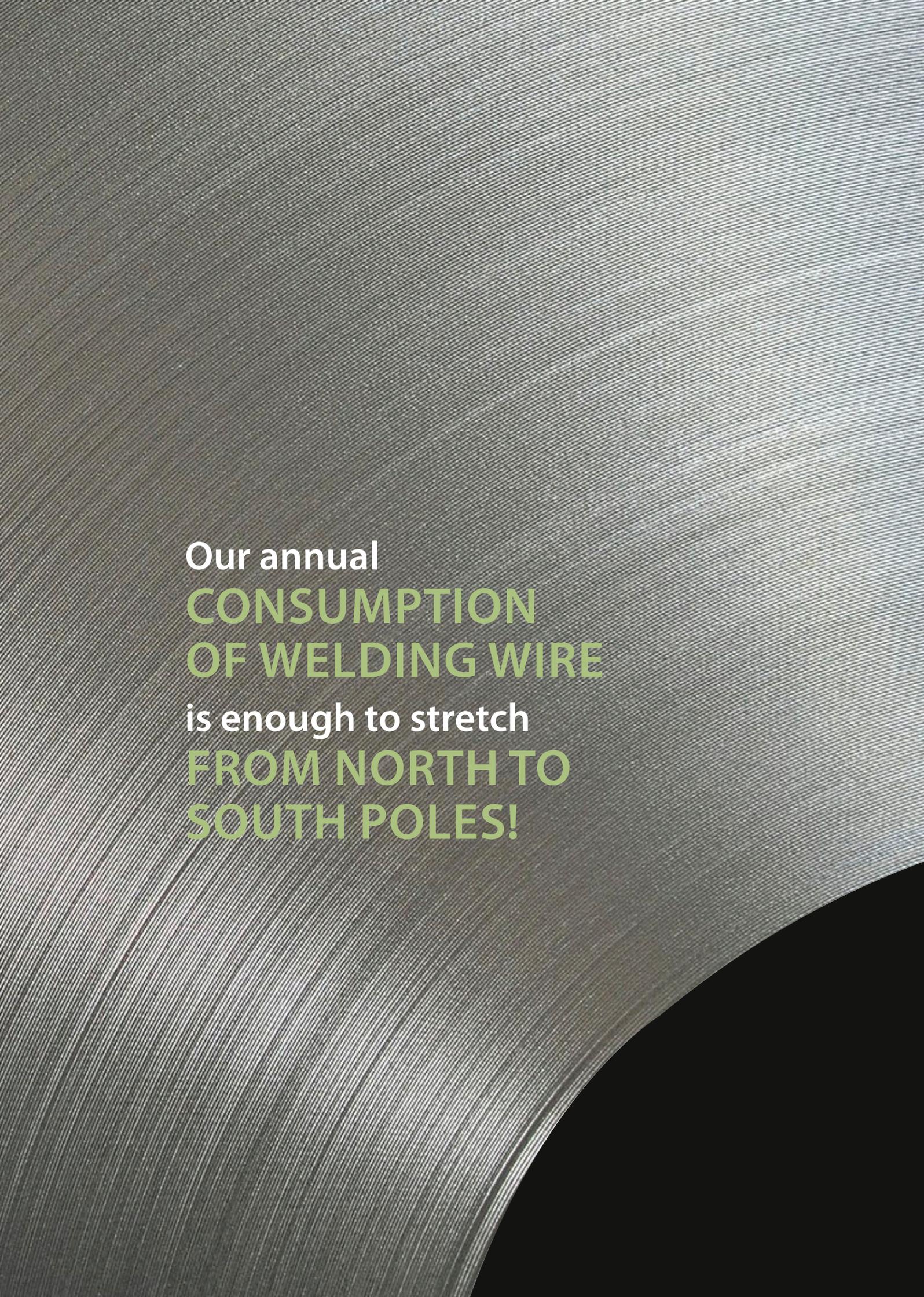




**STARCO WHEEL
MANUFACTURING**
2015-I

If we **STACKED**
A MONTH'S
PRODUCTION OF
WHEELS on top of one
another, the **PILE** would be
TALLER THAN MOUNT
EVEREST!

We spray enough **PAINT**
every day onto our wheels
to **COVER 11 TENNIS**
COURTS!



Our annual
**CONSUMPTION
OF WELDING WIRE**
is enough to stretch
**FROM NORTH TO
SOUTH POLES!**



RIM PROFILES

STARCO's spinning process allows for superb flexibility of rim profiles with easy switching between W, DW and asymmetric profiles. This means the range has a rim suited to for every application.

This means we have a rim suited for every application.

RIM

STARCO rims are engineered to ETRTO norms. STARCO rims provide the basis for any possible wheel solution.



DISC

With our in-house disk design, tooling and manufacturing we support the complete requirement of discs within our product portfolio.



WHEEL

With full control of the rim and disc process - STARCO wheels have the highest standard for its purpose - making us the leading wheel manufacturer.



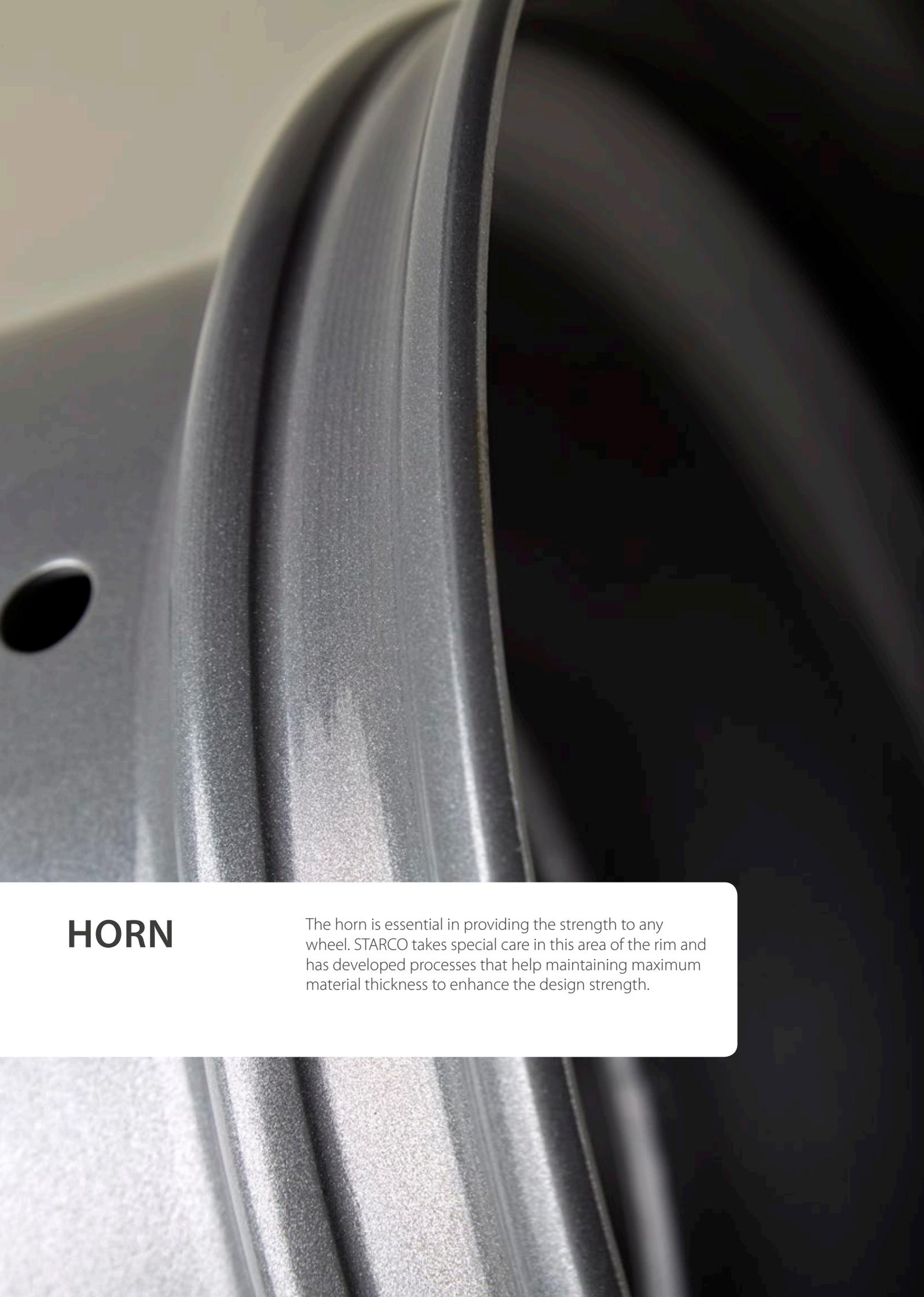
DW symmetric profile



W symmetric profile



W asymmetric profile



HORN

The horn is essential in providing the strength to any wheel. STARCO takes special care in this area of the rim and has developed processes that help maintaining maximum material thickness to enhance the design strength.



STANDARD HORN



The standard flange horn has a large rolled over edge, providing good strength and easing tyre fitment.

HORN REINFORCEMENT



For really heavy or tough applications such as Forestry, STARCO offers rims with horn reinforcement straight from the factory. These rims are significantly strengthened with a welded ring around the inside of the horn.



Horn on rolled wheels

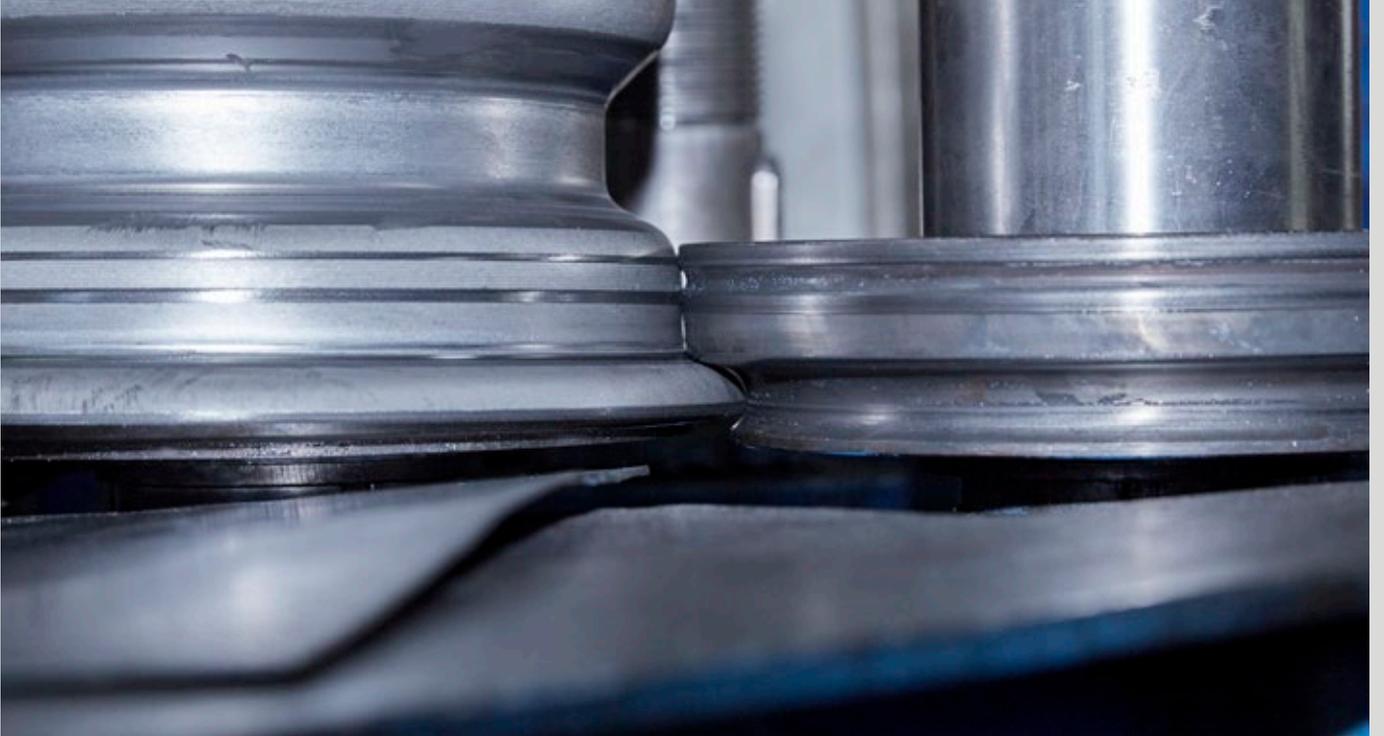


Welding of horn reinforcement



HUMPS

Humps are a safety feature designed to prevent the bead of the tyre dropping into the wheel well during sudden deflation. As the tyre bead is retained, lower running pressures can be used.



BEAD RETENTION HUMPS

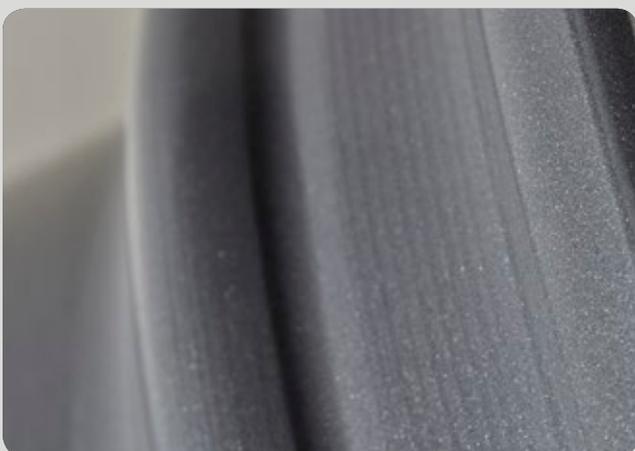
- ▶ Wheels from STARCO are the only in the market with humps in rolled 8", 9" & 10"
- ▶ All pressed wheels for Agricultural and Industrial are provided with humps
- ▶ All rims from STARCO are with humps on one or both sides
- ▶ The STARCO humps are clearly defined – Keep the tyre safely seated - Improve stability - Less risk of damage caused by sudden deflation
- ▶ The humps ensure tight fitment - giving the possibility to run at very low inflation pressure



H1



H2



Horn



Quality check of horn



Plug fit disk - installed



Plug fit disk - pressed in



Plug fit disk - welding

DISC

STARCO makes all discs in-house. This ensures full control of material, form and fitment optimized for STARCO rims.



Our squared disc



The flat disc



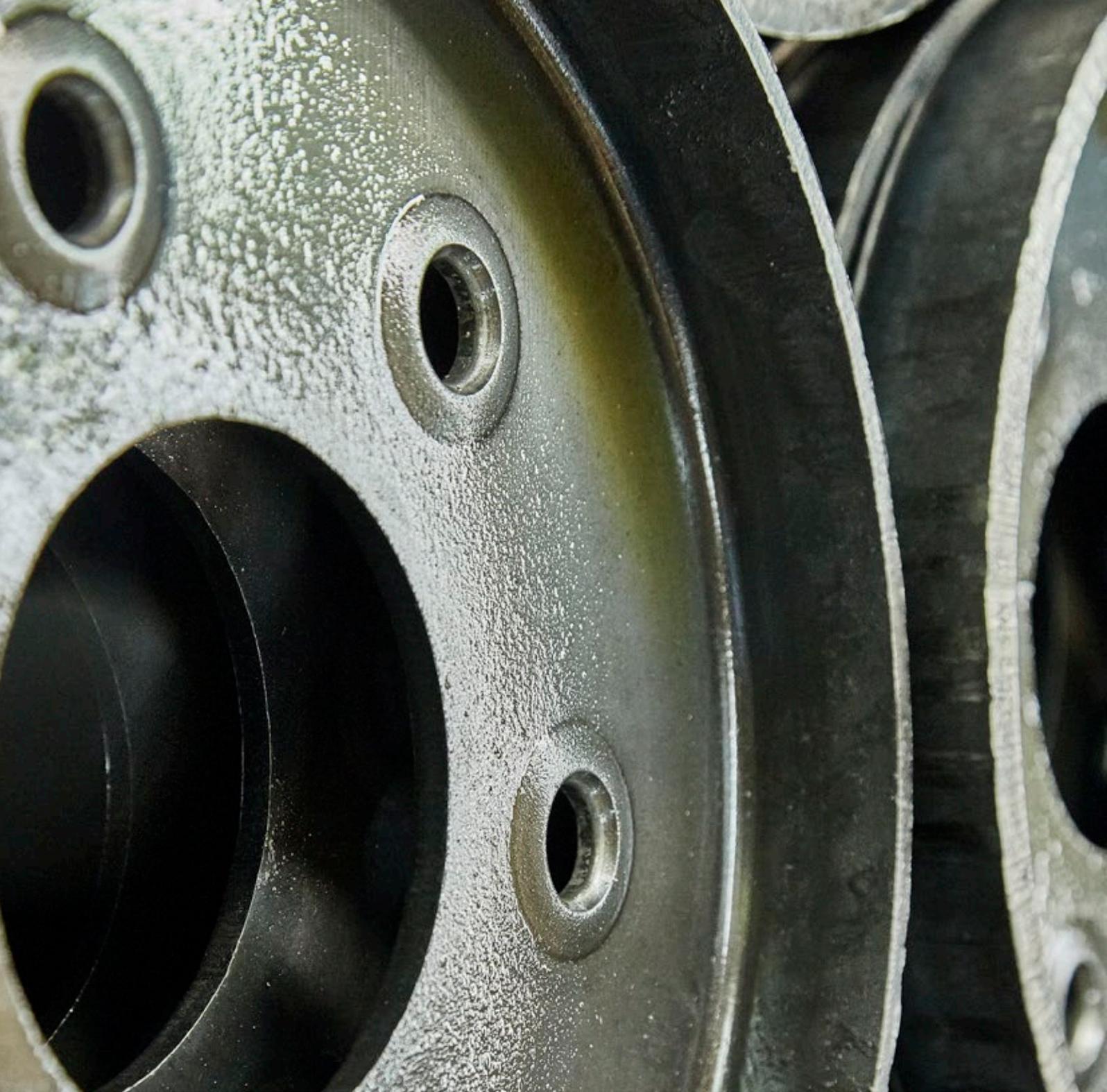
Our plug Fit disc



Deep plug fit disk



Plasma cutting



STUD HOLE

The wheel can be centered by a close fit to the spigot of the hub or by the wheel nuts seated into a countersunk stud hole.

When plain stud holes are used this is called ISO, Spigot Fixing or Hub Centering Wheel Fixing. Wheel fixing with countersunk holes is often referred to as Bolt Centering Fixing.

Flexible production setup - Stud holes, bores, seating etc. can be produced to match customers' requirements.

PLAIN SEAT

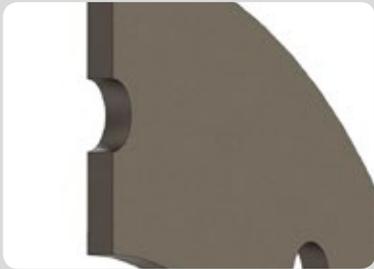
- ▶ The bore of the wheel fits very closely to the hub spigot and the wheel centers itself

SPHERICAL COUNTERSINK

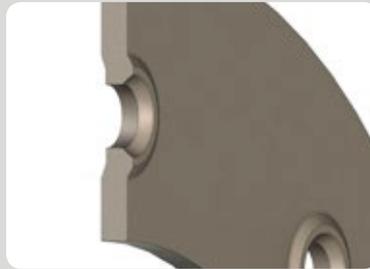
- ▶ The countersink stud hole design centers the wheel and keeps it in position.
- ▶ The spherical countersink is expressed as a radius, e.g. R16 (radius of 16 mm).
- ▶ The conical countersink is expressed as an angle e.g. 60°

CONICAL COUNTERSINK

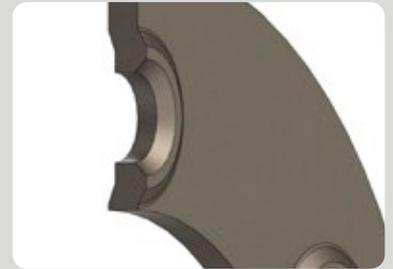
- ▶ British Standard / Imperial Standard.
- ▶ The shape of the countersink is expressed in degrees, the most popular being 90°, 80° and 60°. E.g. with C90 (90°)



Plain seat



Spherical countersink



Conical countersink

PLAIN SEAT

- ▶ This method produces the strongest seat, as no material is removed. Being pressed rather than machined, indeed the compression of the metal makes it harder and stronger. Countersink can be conical or spherical.



Puching and forming...step 1



Step 2



Step 3



INTEGRAL WHEELS

STARCO's pressed wheel range includes a wide range of possible integral hub configurations – enabling us to supply wheels for almost any thinkable axel fitment and application.^a



First form



Second form



Hump and horn forming



Welding (cold metal transfer)

THE PRESSED WHEEL

- ▶ In-house tooling department for unique wheel design
- ▶ Flexible capacity for efficient high volume production
- ▶ Special welding process for optimal production flow



First form



Second form and data stamp



Horn form & punch



HUB POSITION

Integral wheels can be produced either for Central Hub Fitment or for Offset Hub Fitment. The difference lies in the position of the hub and the method of attaching the wheel to the axle.

WHEELS WITH INTEGRAL HUB

The construction of these wheels includes a tube welded into its centre. Bearings are fitted into this tube, which guarantees smooth operation with suitable load carrying ability. There are a wide range of bearing specifications with different bore diameters and load characteristics dependent on the application.



Flange ballbearing



Nylonbush



Rollerbearing



Plain hub



Ballbearing (nipped seating)



Ballbearing (machined seating)



Press-in key



Standard keyway



Greasenippel



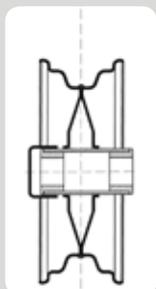
Screw-in cap



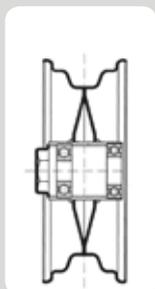
Press-in cap



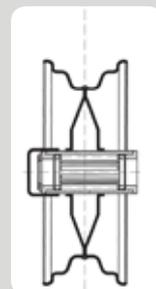
Axle for mounting



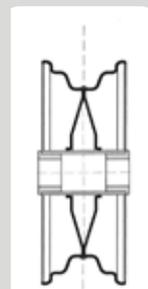
EG-E0



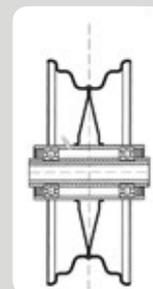
EK



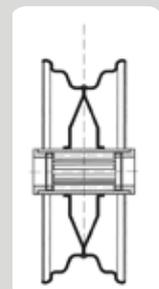
ER



GG-G0



GK



GR



PAINT SYSTEMS



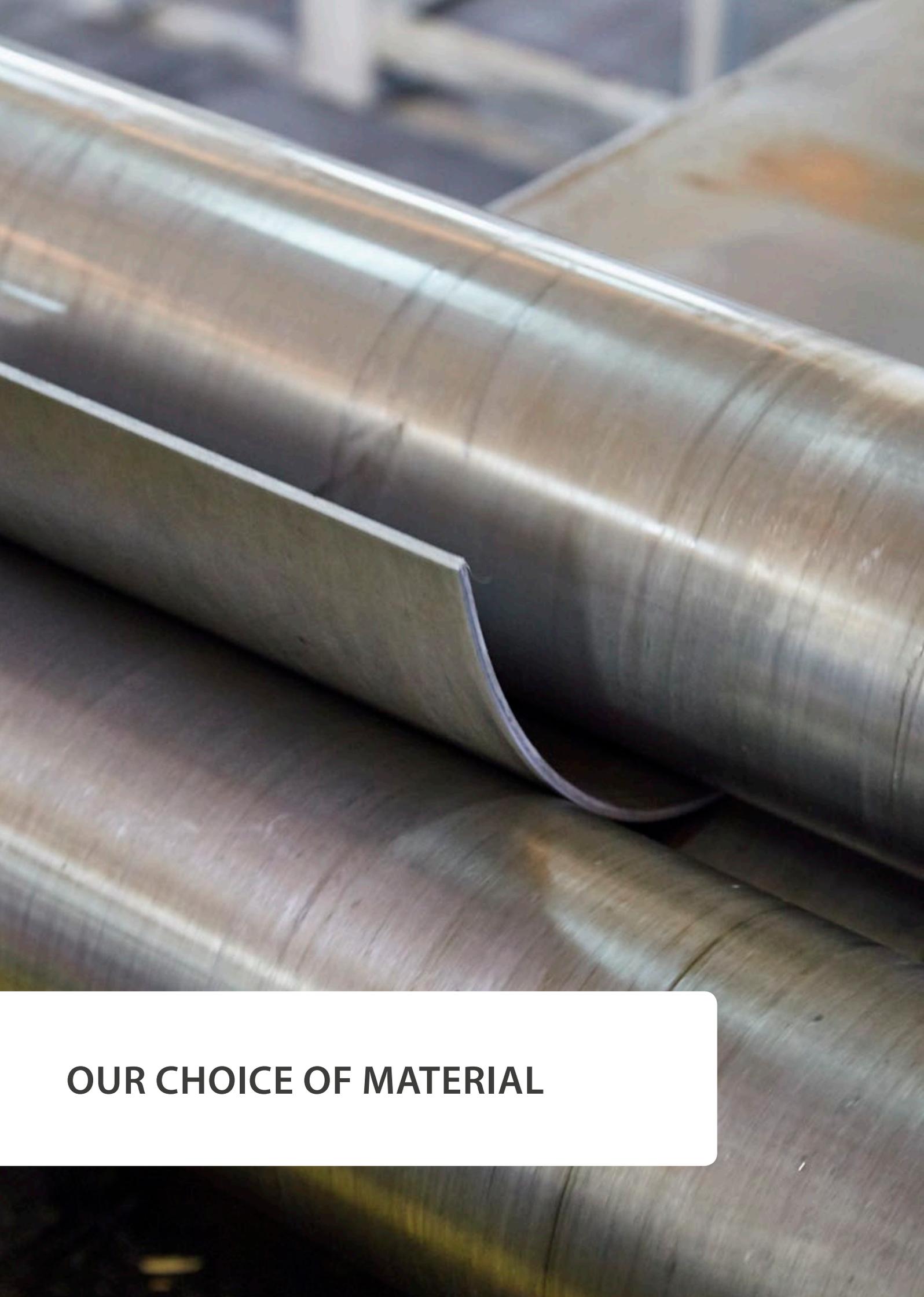
BEAUTY IS MORE THAN SKIN DEEP - EVERY WHEEL FROM STARCO SHINES

- ▶ Special pretreatment steps providing excellent paint adhesion
- ▶ E-coat and powder paint lines for small and medium sized wheels
- ▶ Ultra high solids wet paint technology for larger wheels and dual systems
- ▶ Good edge coverage with excellent corrosion protection

All paint systems are installed for maximum flexibility with quick change over between production batches - making any color possible.



E-coat



OUR CHOICE OF MATERIAL



AT STARCO WE DO NOT COMPROMISE ON QUALITY

We have developed long term relationship with key suppliers. With a mutual understanding of the complete supply chain, materials of the right quality are always available from our sourcing partners.



0814

MAX 2.0 BAR 30 PSI

TRACEABILITY

STARCO

All wheels from STARCO are identified with a code

- ▶ STARCO wheel identification - with our logo
- ▶ Clear marking of wheel dimensions and safety information
- ▶ Date stamping for easy traceability

2-504x8

SHN
MHS

**QUALITY MAKES THE
DIFFERENCE**





- ▶ Continued development of world class manufacturing processes
- ▶ Key product parameters are regular verified
- ▶ Ongoing investment in the best training of all employees

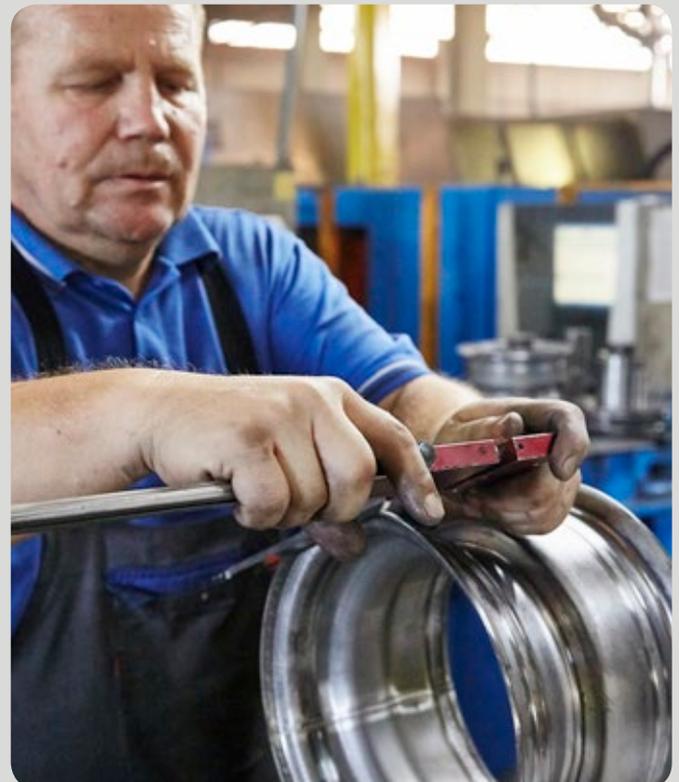
Full member



STARCO wheel manufactures are ISO 9001 & ISO 14001 certified



Paint chemical quality test



Verification of key dimensions



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