



grinding with
a steel expertise



ACCIAIERIE BERTOLI SAFAU
ABSOLUTE STEEL QUALITY

ABS SFERE: RESEARCH AND INNOVATION BY ACCIAIERIE BERTOLI SAFAU

ABS was created in 1988, by joining together hundreds of years of experience from two historical Italian companies.

- ✓ We boast a unique range at a single site, **in our facilities at Pozzuolo del Friuli, near Udine, Italy.**
- ✓ We make more than 1,000 types of steel grades: **a variety that makes us unique in the international arena.**
- ✓ In ABS we produce steel from 94% of scrap and are constantly committed to improving the energy efficiency of our production processes to **reduce CO₂ emissions.**

OUR FIELDS OF APPLICATION

ABS products are recognized and appreciated in many industrial sectors, including:

	Automotive	35%
	Power Generation, Mining, Railway & Others	31%
	Mechanical Engineering	25%
	Oil & Gas	9%

ABS IS THE STEEL-MAKING DIVISION OF THE DANIELI GROUP,

the construction leader of steel plants all over the world.



DANIELI

STEEL-MAKING + PLANT-MAKING = DANIELI GROUP

	Employees	1,541	8,191	9,732
	EBITDA	170 M€	253 M€	424 M€
	Revenue	1,442 M€	2,599 M€	4,102 M€



ECO-SUSTAINABLE QUALITY THAT LASTS OVER TIME



94%
**of the raw material
used is of recycled
origin**

Steel from scrap produced
with EAF furnace.



100%
made in Italy

High-quality steel
of certain origin
manufactured in Italy.

100%
European scrap



-65% CO₂
**emissions in steel
production**

Compared to blast furnace
steel production methods.

A EUROPEAN HIGH-QUALITY GRINDING BALLS MANUFACTURER FOR CAPACITY AND RANGE



Guaranteed raw material supply

Thanks to ABS scrap management.



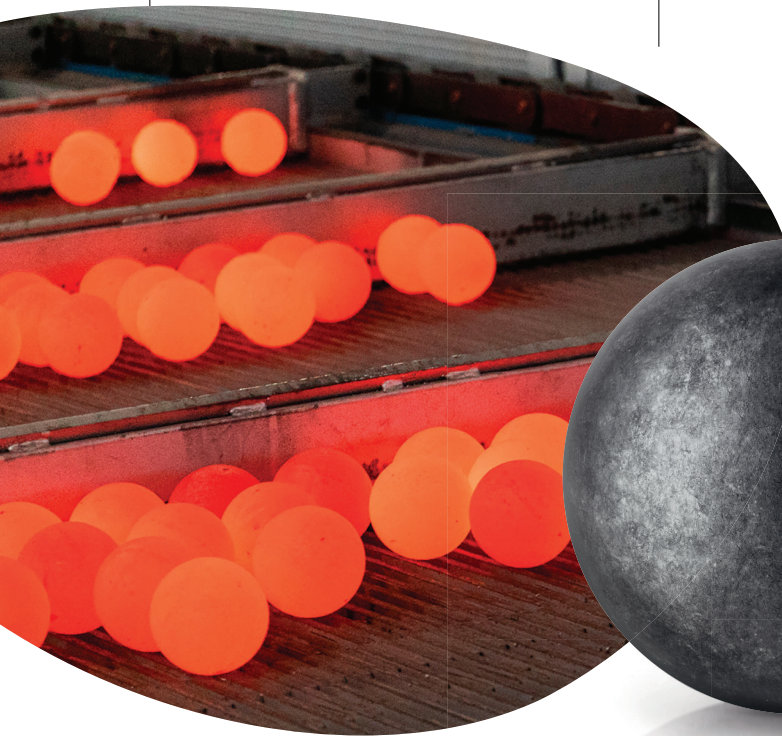
150,000 tonnes of forged grinding balls

For the mining industry.



A wide product range

Two production lines provide a complete range of grinding balls from 30 mm up to 150 mm.



QUALITY CONTROL TESTS



Quality control throughout the entire production cycle

ABS certifications

- ISO 14001
- ISO 9001
- ISO 45001



Tailored heat treatment

The martensitic structure obtained during the manufacturing of the grinding balls guarantees excellent hardness.



Drop test

SAG balls are drop-tested to ensure the mechanical characteristics required by our customers.

ACM RESEARCH AND DEVELOPMENT CENTRE Metz - France



A tailor-made product

Drawing on the expertise acquired by our ACM Research Centre, we are able to create specifically-tailored alloys, using digital models to simulate the mechanical characteristics required by our customers.



Optimized chemistry.

The chemical composition of the bars from which the grinding media are manufactured can be tailored according to specific requirements.



Heat treatment across the entire range.



SAG balls from Rotoforgia and exclusive heat treatments

Additional heat treatments are currently being studied to improve the metallurgical characteristics of our SAG balls range.



A SINGLE CONTACT POINT FOR ALL YOUR REQUIREMENTS



TECHNICAL SUPPORT

A long history and an in-depth experience in the application of steel.

- ✓ **Support during both application and use of our grinding balls.**
- ✓ **Specification and execution of grinding tests:**
 - Marked Ball Wear Test;
 - Production Test.
- ✓ **Processing plant personnel training courses.**



LOGISTICS SUPPORT

- ✓ **In-house logistics service for our territory of reference**
We guarantee carriage to the final destination of our products, if requested.
- ✓ **Delocalized warehouses in the different mining areas where grinding balls are used the most.**
- ✓ **Customization of shipping packaging.**
We offer our customers a range of packaging solutions to meet specific requirements.

TECHNICAL SPECIFICATIONS AND QUALITY RANGE

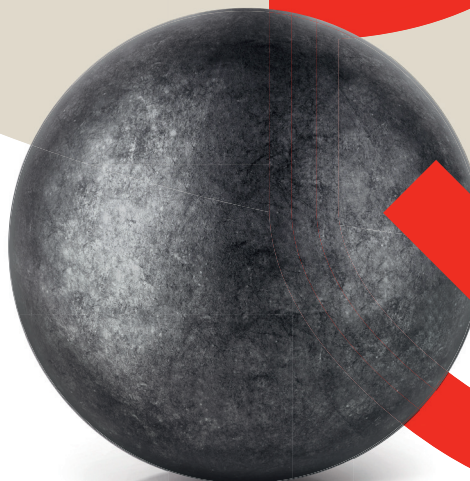
NOMINAL BALL DIAMETER [mm]	NOMINAL BALL WEIGHT [kg]	NUMBER OF BALLS PER TONNE [no.]
30	0.111	9,011
40	0.263	3,801
50	0.514	1,946
60	0.888	1,126
70	1.410	709
80	2.104	475
90	2.996	334
100	4.110	243
110	5.471	183
125	8.028	125
130	9.030	111
140	11.279	89
150	13.872	72

QUALITY	HARDNESS ROCKWELL C [HRC]	MAIN FEATURE
Full Hardness	60-65	high abrasion resistance
Intermediate Hardness	55-60	combining impact and abrasion resistance
Reduced Hardness	48-55	high impact resistance



PRODUCT TYPE

BALL DIAMETER [mm]	APPLICATION
30-50	regrinding ball
60-90	mill ball
100-150	sag ball



**ABS Sfere is a product by
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ABS

