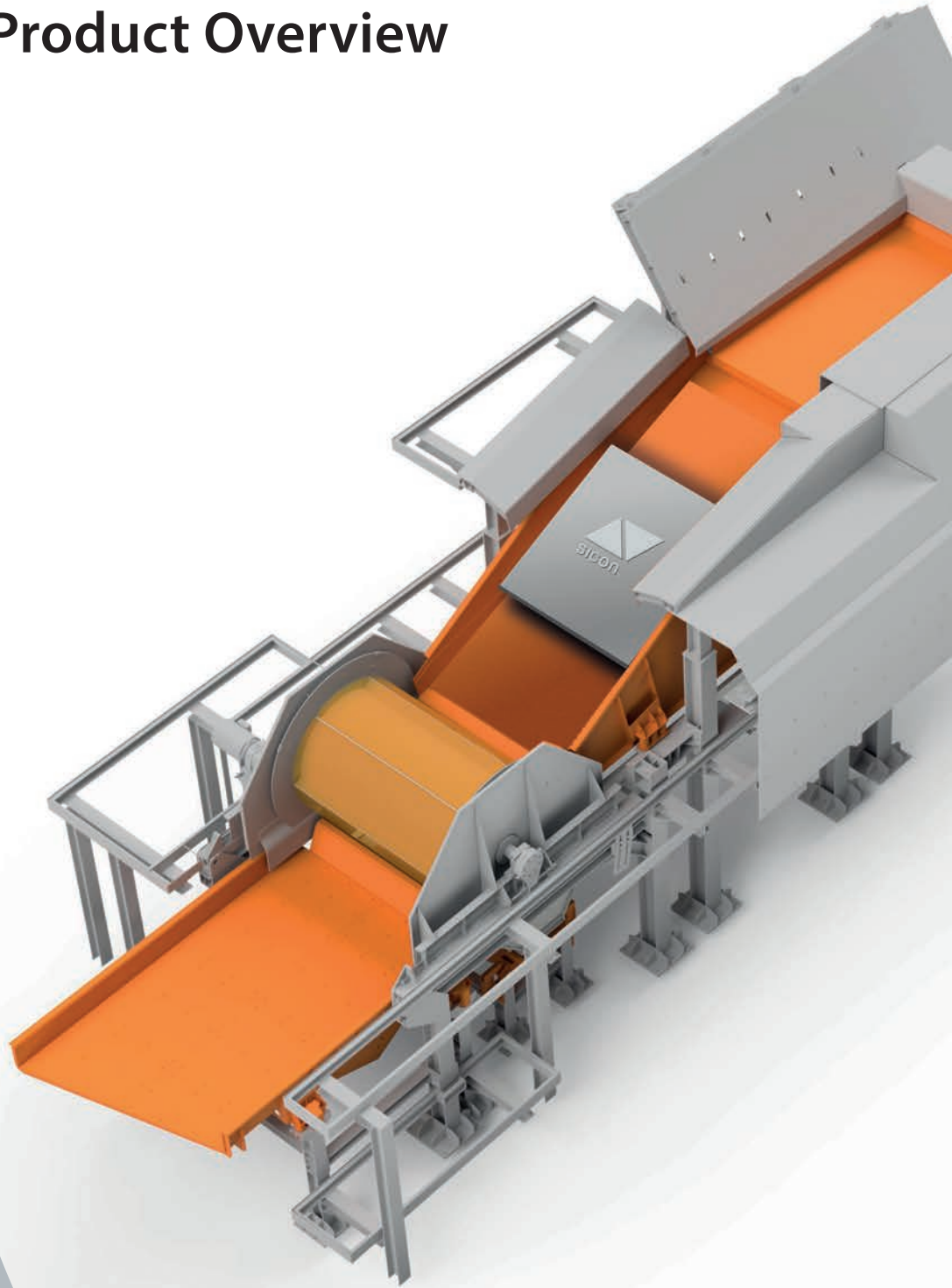




Scrap Solutions for the Steel Industry

Product Overview



DEDICATED TO PERFORMANCE



SICON – Exceptionally flexible!
Extremely adaptable!
360°-view!



20 years of high-quality plant engineering – Scrap and Metal Recycling made by SICON

With two decades of experience in plant design and with a continuously growing team SICON has realized a multitude of domestic and international projects. Among serviced customers are many small- and mid-sized scrap recyclers as well as multi-national steel plants and conglomerate recycling companies.

SICON offers the right machine and best-fit system for any requirement within the scrap and metal recycling business. Furthermore, SICON offers its customers to oversee each step of a project and acts as a complete solution provider for highly-customized projects and systems. Our expertise and product portfolio ranges from single machines up to complete project planning and realization of system upgrades.

All of our machines are field-tested in our Technical Research Center (TRC), where our equipment and processes are being developed and improved continuously. Our latest development is the LIBS-based LaserSort, which is available for customer testing alongside the EcoShred® Vertec.



EcoScan® Online - X-Ray Online Scrap-Analyzer



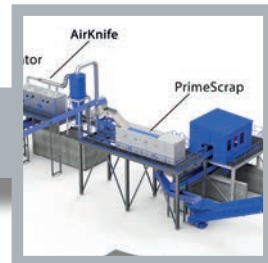
04

HMS Cleaning - Cleaning of HMS



06

ScrapTuning® - Ferrous Downstream Upgrade



08

EcoRip® - Pre-Shredder Series



10

EcoShred® Compact - Combined Pre- and Main Shredder



12

Coolant Scrap for the Steel Industry



14

Online Analysis for Shredded Scrap and Non-Ferrous Metal Mixtures

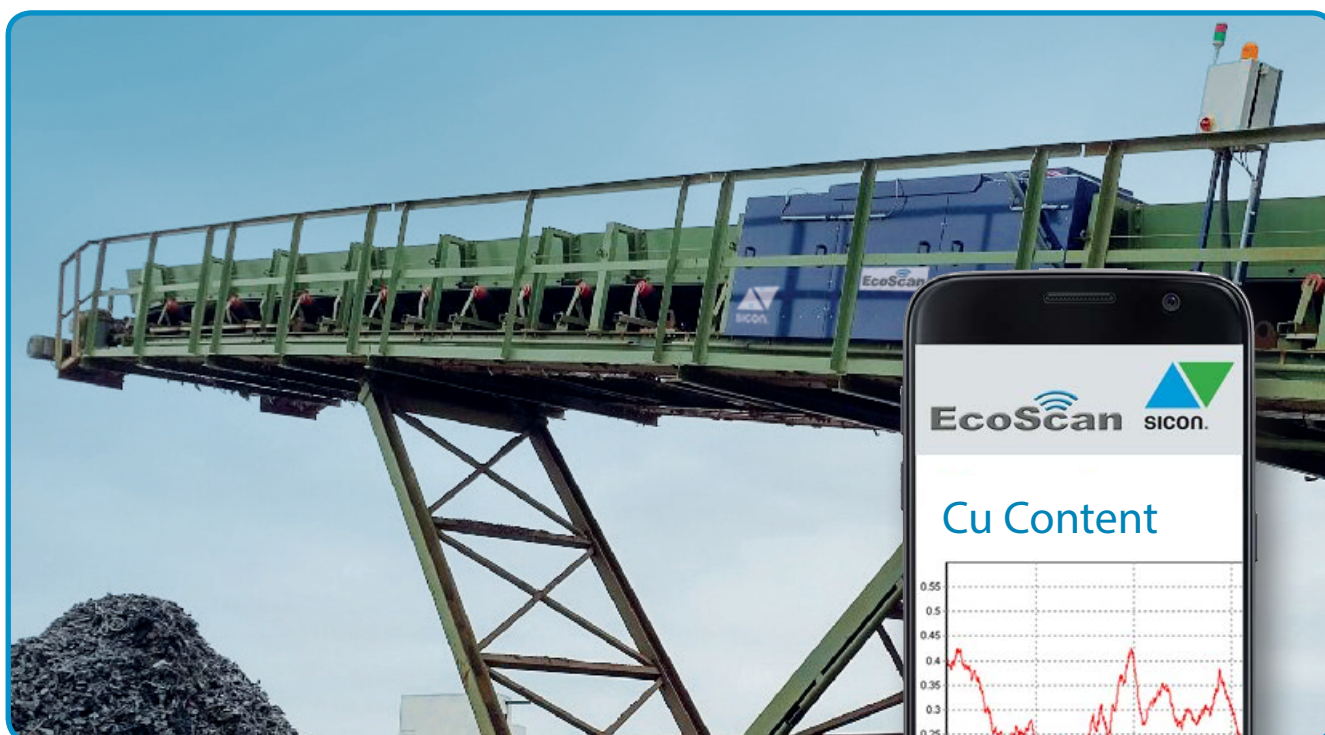


The EcoScan® Online is the first compact and economical Online Analyzer, which enables a constant analysis of the scrap quality.

Awarded with the German Excellence Prize 2020!

- Permanent monitoring of the copper content in shredded scrap (also in other mixtures)
- Control of the bulk density (optional)
- Individual integration into existing systems
- Smart alarm system
- Detailed reporting system
- Optional certificate system
- Data utilization for improved plant automation
- Online control of non-ferrous scrap and rejection of inferior qualities before melting
- Many other possible applications (e.g. turnings)

BENEFITS



With the „EcoScan Mobile App“ the operator is always informed about any aspect of the analyzer:

- Remote data access available
- Smart Alarm System for unusual or critical quality deviations
- Integration into an overall data control system
- Benchmark system for comparison of different locations available

Exemplary daily report - Shredded Scrap

	Tonnage	Fe	Cu	Mn	Mo	Ti	Zn
	t/h	%	%	%	%	%	%
Zeit	Wert	Value	Value	Value	Value	Value	Value
8:00	72,20	97,144	0,406	0,301	0,004	0,004	0,045
9:00	79,41	97,113	0,432	0,292	0,004	0,004	0,053
10:00	62,45	97,060	0,499	0,295	0,004	0,004	0,049
11:00	71,71	97,062	0,478	0,300	0,004	0,004	0,052
12:00	77,17	97,128	0,424	0,298	0,005	0,004	0,052
13:00	66,56	97,099	0,462	0,293	0,005	0,004	0,050
14:00	62,34	97,115	0,457	0,294	0,005	0,004	0,052
15:00	57,89	97,065	0,482	0,300	0,004	0,004	0,050
16:00	65,78	97,067	0,494	0,304	0,005	0,004	0,044
17:00	41,94	97,050	0,487	0,311	0,006	0,005	0,045
SUM	666,00						
AVG		97,10	0,46	0,30	0,01	0,01	0,05

The solution for the removal of dirt and Non-Ferrous Metals from HMS - Ready for feeding into the EAF



- Significant reduction of slag (5-8 %)
- Increase of the liquid yield to 92-95 %
- Reduction of consumables
- Reduction of power consumption
- Reduction of emissions
- Recovery fraction from screened fines ready for feeding into the EAF
- SICON MagSpin - Permanent magnet with spinning effect
- 3D-screening - 3D heavy duty screen elements
- Fully Automated System - Permanent Mass Balances, Smart Alarm System

BENEFITS

See also the HMS Cleaning Video on our homepage!



The brandnew solution:

HMS Cleaning Mobile

No building permit required!

Saves a lot of time and money!



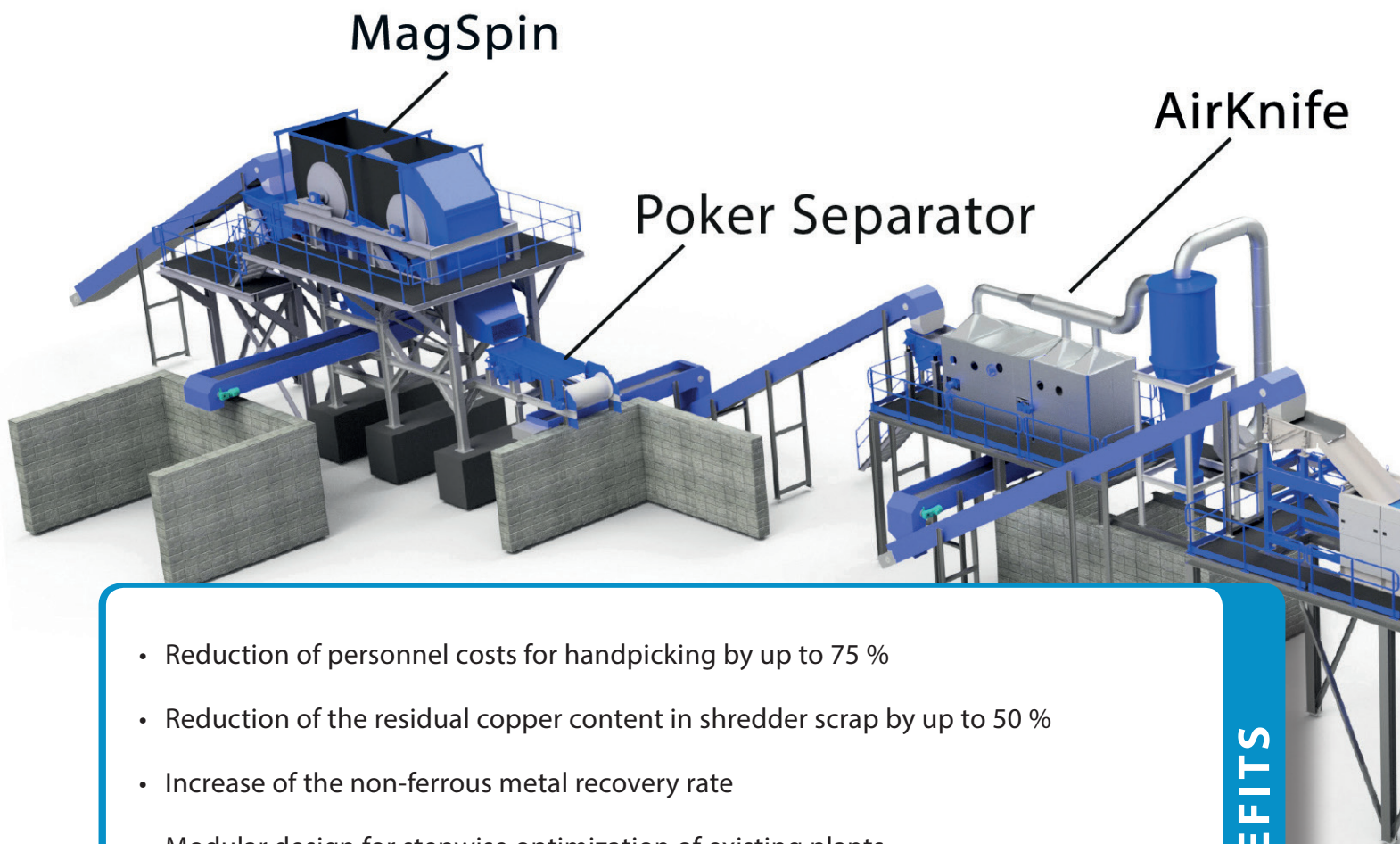
Improving the quality of steel scrap is for SICON the driving force behind the Heavy Metal Scrap (HMS) preparation process. HMS is cleaned intensively and NF metals that are still present are separated. The result is a scrap quality with a considerably higher Fe content and reduced NF content (specifically copper and aluminum).

A highly efficient and reliable scrap screening process with an integrated metal recovery step that was specifically developed for this application enables a significant improvement in quality, while delivering additional scope of metal recovery at the same time. The innovative combination of efficient screening and magnetic separation produces optimum results. SICON adapts the HMS Cleaning to specific customer requirements. Throughput rates of up to 300 tph are achievable.

Features	HMS Cleaning Mobile	HMS Cleaning Basic	HMS Cleaning Advanced
Throughput	30 - 80 tph	70 - 150 tph	70 - 300 tph
Installation	Semi-mobile	Stationary	Stationary
Separation feeding zone	✓	-	✓
Acceleration of the scrap	✓	-	✓
3D-screening	✓	-	✓
Magnetic separation	✓	✓	✓
Optional with dust suppression	✓	✓	✓
Discharge of residues with panfeeder	✓	✓	✓
Separation of fines residues	✓	-	✓
Remote control by cameras	✓	✓	✓
Prozess data collection	✓	✓	✓
Solutions for NF metal recovery	✓	✓	✓

The solution for better quality of Shredded Scrap

Every steelmaker and shredder operator is interested in generating a low-copper shredded scrap on a reliable quality basis at no additional costs. With ScrapTuning® SICON has developed a system that meets this requirement. The innovative combination of an ideal separation of long elements, an optimized air sifting and meatball separation leads to a cleaner shredded scrap. SICON AirKnife® separation system reliably separates debris and exposed copper strands/cables. Copper-rich fractions are separated from low-copper shredded scrap with the aid of a ballistic meatball separator. Therefore, only 25 % of the otherwise usual quantity of material are supplied to a manual sorting process. The optional integration of a SICON XT-Sorter completely eliminates the need for manual sorting.



- Reduction of personnel costs for handpicking by up to 75 %
- Reduction of the residual copper content in shredder scrap by up to 50 %
- Increase of the non-ferrous metal recovery rate
- Modular design for stepwise optimization of existing plants
- Ready for integration of advanced automated sorting technologies
- Throughput 20 - 300 mt/h

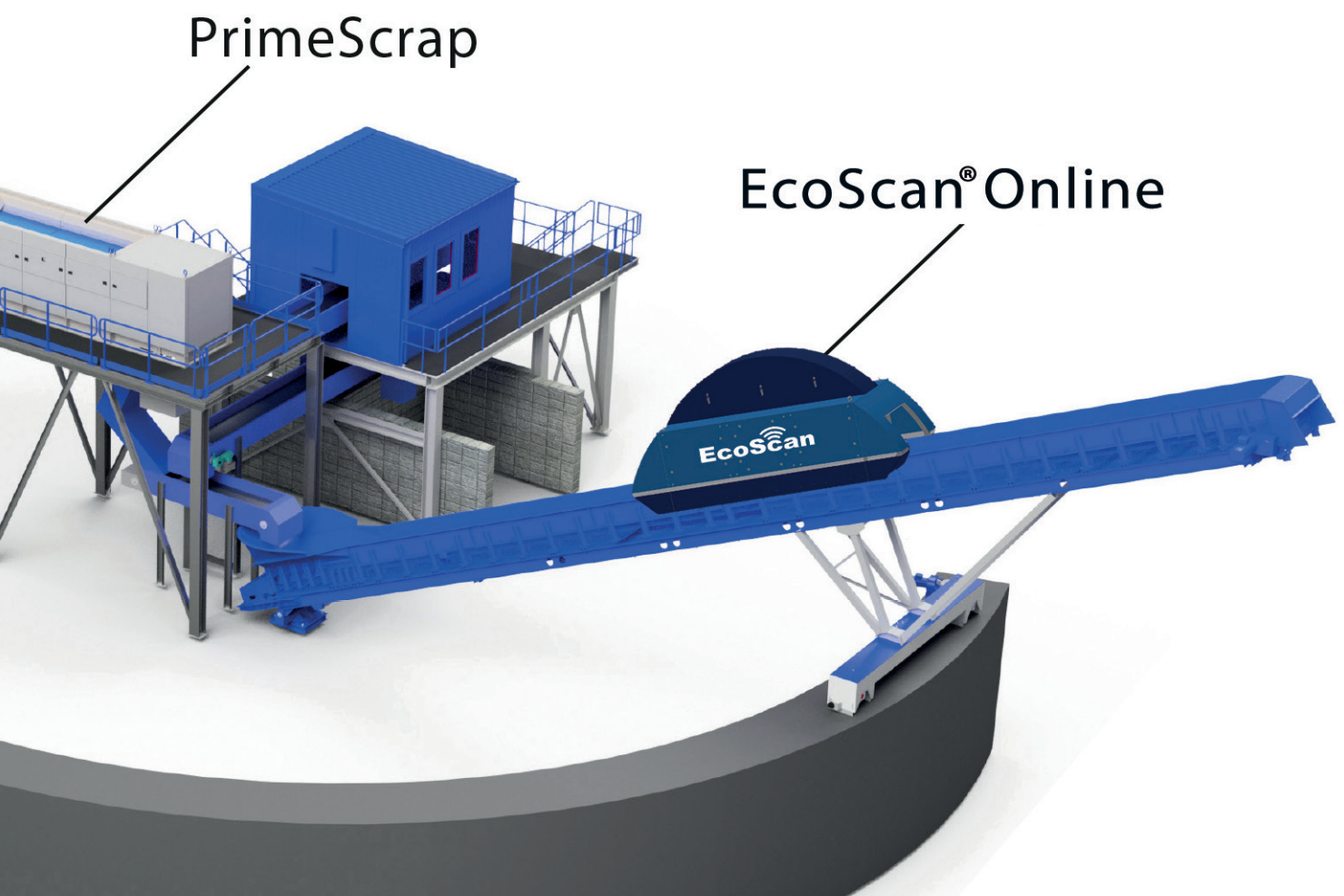
BENEFITS

SICON ScrapTuning® can be integrated in existing systems. An offline installation is also possible and is very interesting for steel mills when it comes to improving the quality of shredded scrap. The SICON team provides individual advice and adapts the system to the specific local conditions and customer demands.

SICON considers both disadvantages unacceptable in times of intense competition and cost pressure. SICON offers shredder operators an efficient alternative in every aspect: the permanent magnet SICON MagSpin. The permanent magnets for the Ferrous Downstream are available in widths of up to 2,600 mm (110") and a diameter of up to 1,600 mm (71"), suitable for every shredder size.

SICON ScrapTuning® not only has a positive effect on the quality of the shredded scrap, but increases at the same time the recovery of non-ferrous metals. The fact that significantly less copper is lost in the shredded scrap means that there are more non-ferrous metals available for the non-ferrous downstream. The additional amount of non-ferrous metals recovered pays for the ScrapTuning® process within a short period of time, in many cases within just a few months. Contact our specialists to obtain further information. They would be happy to prepare a business case for you!

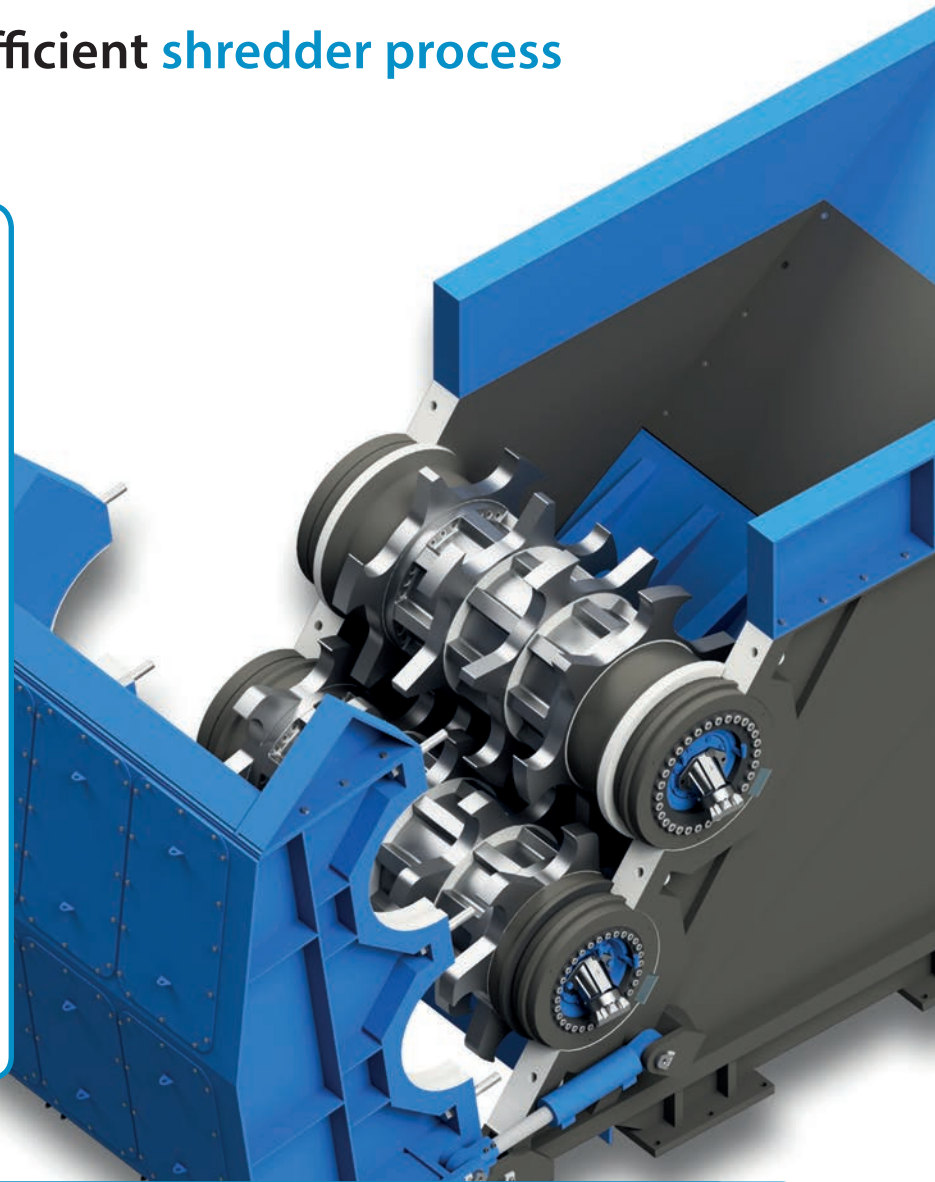
The separated copper meatballs can be prepared using the SICON Meatball Process (EcoShred® Vertec) and separated into clean NF- and ferrous metals.



The basis for a more efficient shredder process

Processing shredder feedstock with the aid of EcoRip® always makes good sense both technically and economically. The SICON EcoRip® Pre-Shredder is characterized by a high output at defined particle sizes and is also especially easy to maintain. That makes the EcoRip® Series the benchmark in terms of technology and efficiency when it comes to processing shredder feedstock.

The EcoRip® is ideal for both pre-shredding mixed scrap with an optional integrated screening step as alternative to a guillotine shear, as well as for pre-shredding shredder input material prior to loading onto a shredder infeed conveyor. The SICON EcoRip® can also be flexibly used as an effective stand-alone solution or can be subsequently added to an existing system.



EcoRip™ as an upstream addition to any shredder line for pre-shredding

- Pre-shredding of bales, auto bodies, mixed scrap – is thus also possible in smaller shredders
- Separation of inert fines with the aid of integrated screens upstream of the main shredder
- Increase in performance of main shredder (by up to 30 %) with corresponding adaptation of the electronic control system of the main shredder
- Significant decrease in wear and tear of main shredder
- Prevention of explosions occurring in the main shredder, thus decrease in emissions
- The combination of EcoRip® and main shredder enables SICON's dry AirTuning® exhaust purification process
- Segmented rotor for simplified maintenance
- Power-controlled hydraulic pumps reduce the speed at high torque

BENEFITS

Its key advantages include an improvement in the performance of the main shredder by up to 30 % with increased reliability (reduced wear and tear and decrease in emissions), as well as lower energy costs with improved quality of scrap (higher density). An ideal implementation calls for the control system of the main shredder to be adapted by an expert from SICON. The advantages of the SICON EcoRip® are reflected in a considerable improvement and operational efficiency of the whole shredder line. EcoRip® will make your shredder process considerably more competitive.

Input Material



ELV



Engine Scrap



Logs

Variation	EcoRip® 200 Neo	EcoRip® 250 Neo
Feeding width [inch/mm]	80" / 2,000	100" / 2,500
Input power		
Top rotor (slow moving) [kW/HP]	90 / 120	205 / 279
Bottom rotor (fast moving) [kW/HP]	250 / 335	710 / 965
Flipper [kW/HP]	22 / 30	37 / 50
Speed		
Top rotor (adjustable) [min ⁻¹]	3-6	3-6
Bottom rotor (adjustable) [min ⁻¹]	14-20	14-22
Output [t/h]		
Mixed scrap, ELVs	approx. 70	approx. 100
Bale density <0.8 t/m ³ / 50 lbs/ft ³	approx. 40	approx. 70
Bale density <1.0 t/m ³ / 62 lbs/ft ³	approx. 30	approx. 50-60

Shredding made simple!

For many years, large-capacity shredding installations were reserved primarily to a small group of financially larger scrap processors. The advantage of the EcoShred® Compact made shredder technology also available to small- and medium-sized scrap processors and automobile recyclers.

With the EcoShred® Compact, SICON relies on state-of-the-art shredder technology integrated in a modular and economically viable system. Both the technical characteristics and the low necessary infrastructure costs are both impressive.

The EcoShred® Compact is equipped with an integrated pre-shredder, which is implemented as a twin-shaft shredder system with flipper. The combination of pre-shredder and main shredder entails significant advantages.



German Excellence Award 2019

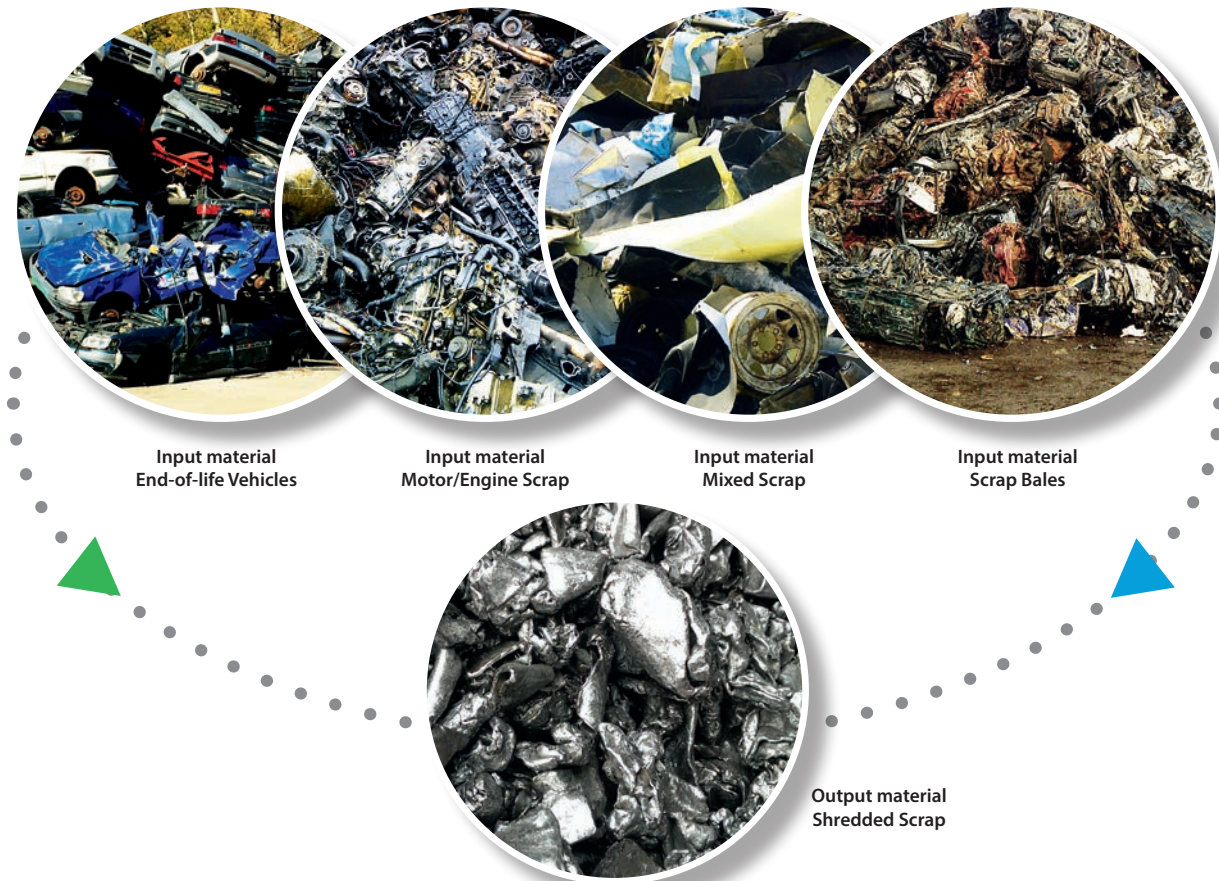
- Scrap is ripped by the pre-shredder and afterwards compacted directly by the main shredder to an optimum
- The risk of explosions is decreased significantly
- Unshreddables do not enter the shredder, which results in an improved operational reliability
- Prevention of any peak loads in the main shredder (uniform power consumption)
- Bales can even be processed with a driving power of just 1,000 kW / 1,350 HP

BENEFITS

See also the EcoShred® Compact Video on our homepage!

Especially versatile

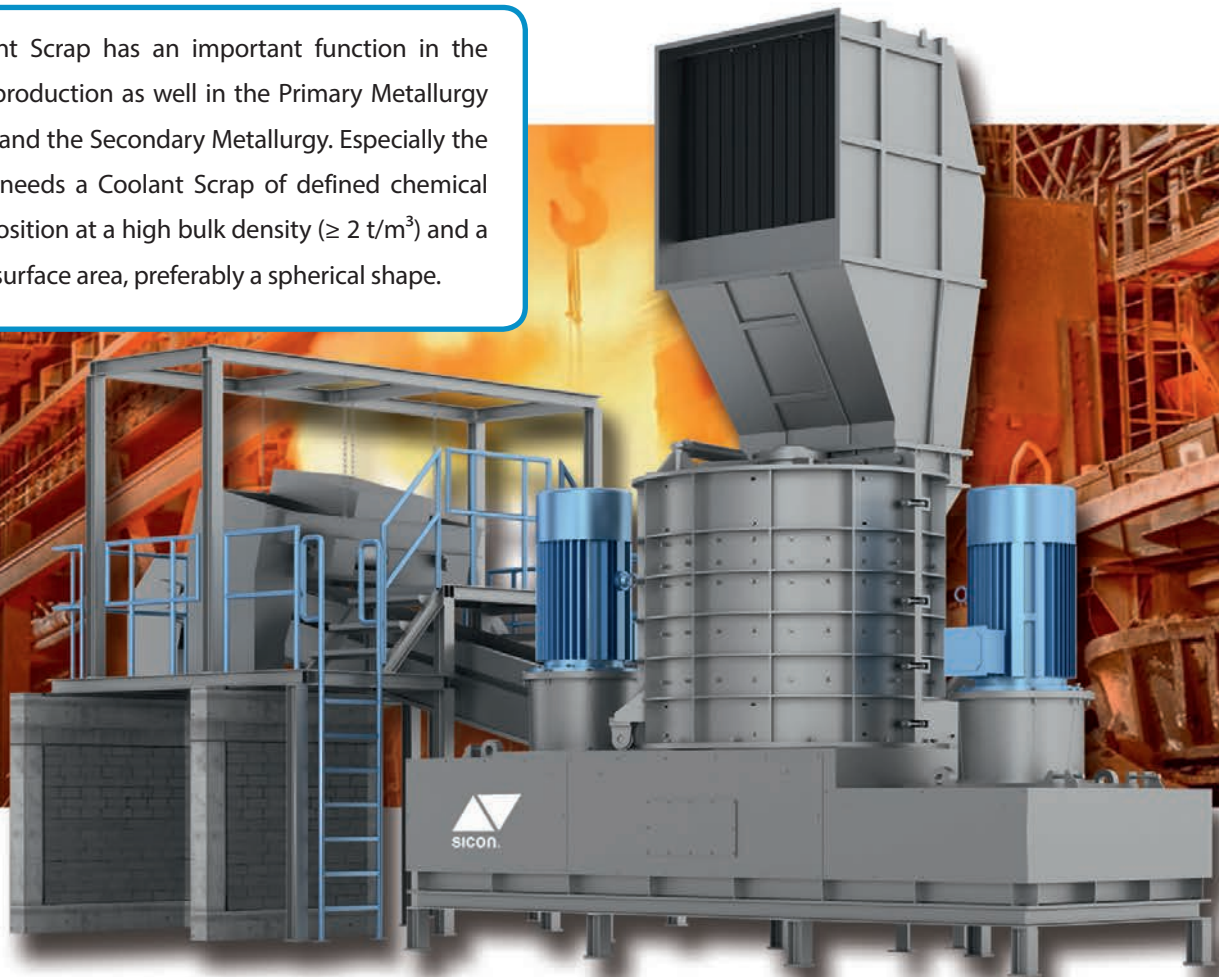
The EcoShred® Compact process results in a high and consistent scrap density and thus a correspondingly good material preparation – with clear advantages for the recovery of non-ferrous metals. The EcoShred® Compact forms the basis for the efficient operation of a shredder system.



- Shredder with integrated EcoRip® pre-shredder in one system
- High scrap density and very good material preparation by means of full box shredding
- Prevention of explosions through material preparation upstream of main shredder
- Heavy components are already identified and separated in the pre-shredder – that protecting the rotor elements in the main shredder from any damage.
- Prevention of peak loads with an optimum energy management system
- Fully automated operation reduces personnel costs
- Significantly higher output by means of an intelligent system combination as conventional shredder with the same driving power
- Easy and safe access for changing wear parts with maximum operator safety
- Significant decrease in investment with regard to power supply (low voltage 400 V / 460 V instead of high voltage 6/11 kV)
- Quick and easy installation as a result of reduced requirements on infrastructure (for instance, a simple foundation slab is sufficient and no separate operations building are required)

Processing of Coolant Scrap with the EcoShred® Vertec

Coolant Scrap has an important function in the steel production as well in the Primary Metallurgy (BOF) and the Secondary Metallurgy. Especially the latter needs a Coolant Scrap of defined chemical composition at a high bulk density ($\geq 2 \text{ t/m}^3$) and a large surface area, preferably a spherical shape.



- Vertical shredder with throughputs of up to 10 mt/h
- Individually adaptable to customer needs including feeding, exhaust handling and downstream systems
- Complete preparation of metal composites (meatballs and electric motors)
- Complete recovery of properly separated copper and ferrous scrap
- Quick ROI due to low investment costs, obtainable high product quality and easy marketing of the products
- Sturdy welded construction - All inner parts of the machine that come into direct contact with scrap are equipped with wear-resistant liners.
- Simple to maintain wear parts are easy to access and exchange
- Generously dimensioned rotor bearings for long plant life

BENEFITS

Coolant Scrap is usually made from production scrap with a known and defined chemical composition. With the EcoShred® Vertec series, SICON has a vertical shredder that was specifically designed for this application and produces Coolant Scrap that best meets the requirements of the steelworks.

The feed material is successively densified over 4 grinding levels. The geometry of Vertec's stator and rotor parts is individually adapted to the respective feed material. By means of corresponding simulations but also access to test plants an optimal design can be achieved.

SICON also takes care of necessary suitable material feeding and downstream, including dust collection. Individual adaptation to customer-specific requirements and the product is carried out here as well.

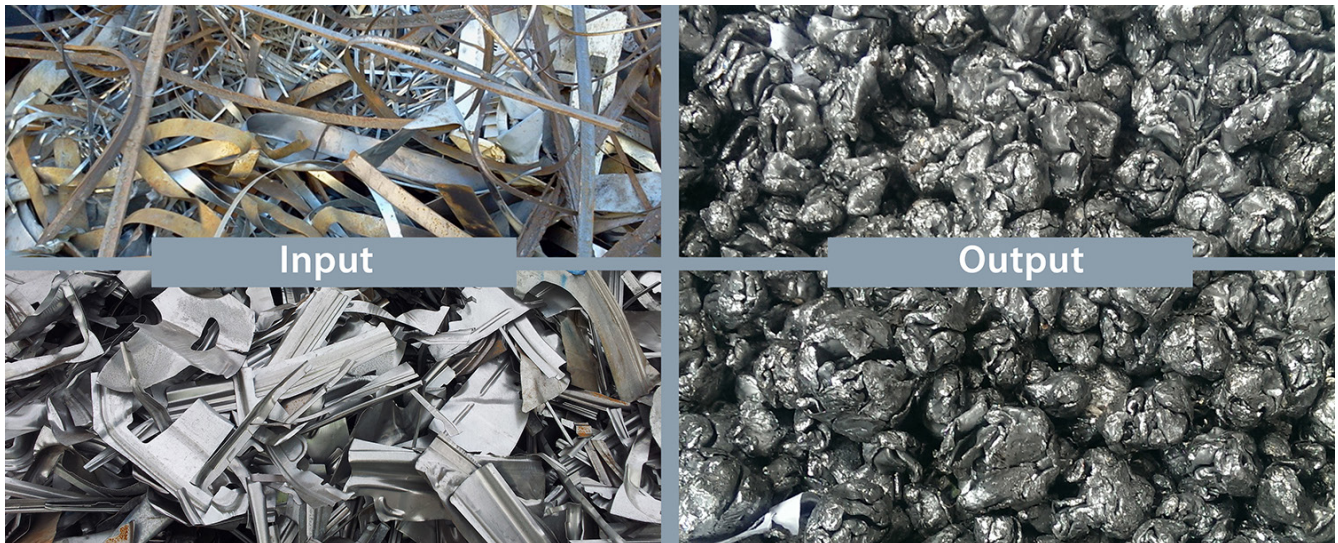


Fig.: Sheet metal waste becomes coolant scrap in its best form - homogeneous and dense material.

Features	EcoShred® Vertec S	EcoShred® Vertec M	EcoShred® Vertec L	EcoShred® Vertec XL	EcoShred® Vertec XXL
Dimension (L/W/H) [mm/inch]	3,300 × 3,800 × 5,000 130 × 150 × 197	3,300 × 3,800 × 5,000 130 × 150 × 197	5,300 × 4,650 × 6,450 209 × 183 × 254	5,500 × 4,750 × 6,600 217 × 187 × 260	5,940 × 5,665 × 7,145 234 × 223 × 281
Hopper opening (W/H) [mm/inch]	1,280 × 1,200 50 × 47	1,280 × 1,200 50 × 47	1,520 × 1,600 60 × 63	1,600 × 1,600 63 × 63	1,800 × 1,600 71 × 63
Input height [mm/inch]	3,700 / 146	3,700 / 146	4,340 / 171	5,300 / 209	6,200 / 244
Rotation speed [r/min]	500 - 680	500 - 680	500 - 580	500 - 580	500 - 580
Minimum clearance [mm/inch]	30 / 1.2	30 / 1.2	30 / 1.2	30 / 1.2	30 / 1.2
Number of upper liners	12	12	12	12	12
Number of lower liners	12	12	12	12	12
Number of breakers	2	2	2	2	2
Number of mill rings	36	36	64	64	64
Chamber inner diameter [mm/inch]	1,140 / 45	1,140 / 45	1,560 / 60	1,680 / 66	2,100 / 83
Chamber operation height [mm/inch]	1,680 / 66	1,680 / 66	1,785 / 70	1,890 / 75	1,950 / 77
Drive power [kW/HP]	110 / 150	160 / 220	264 / 360	500 / 680 *	710 / 965
Weight [kg/lbs]	Approx. 14,500 Approx. 32,000	Approx. 15,000 Approx. 33,000	Approx. 30,000 Approx. 66,000	Approx. 45,000 Approx. 99,000	Approx. 65,000 Approx. 140,000
Throughput meatballs [mt/h]	Approx. 2	Approx. 3-4	Approx. 6	Approx. 8	Approx. 9-10

* The EcoShred® Vertec XL is also available with 440 kW (600 HP).

Service Value

Scheduled maintenance & service ensure that all equipment stays in excellent condition and prevents from unscheduled downtime. SICON offers customized maintenance & service solutions, including consultation, trouble-shooting, rotor repairs & rebuilds as well as service jobs with spare parts delivery and emergency support.

With twenty years of experience, SICON offers operators a complete one hand service solution to ensure processing operations without any surprises!



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