

Company: Advanced Compressor Engineering Services Ltd (ACES)
Location: Chalgrove, UK
Type: Contracted / Independent remanufacturer
In reman: Since 2000
Contact: Eileen Wade (Marketing)
Phone: +44 (0) 1865 891522
E-mail: eileenwade@acescomp.co.uk
Web: <http://acescomp.co.uk/index.html>



Product

Refrigeration and air conditioning compressors

Core Sourcing

Cores are retrieved from several methods (see below) depending on the requests from contractors:

Service contract (main method): Mainly deal with contractors, not manufacturers

Direct-order: Only if contractors want their own compressor returned or a direct replacement is not available from stock will it necessitate the customer/contractor sending his own compressor in for remanufacture.

Deposit-based: All compressors supplied from stock are sold on an exchange basis and ACES need the old (broken) compressor returned in exchange.

Buy-back: It happens occasionally – defunct plant, surplus comps etc.

Voluntary-based: Not usually but defunct compressors are often offered and purchased to boost stocks. i.e. when a plant room has become obsolete and the equipment is sold off.

Business Model

Value Chain: ACES is one of the largest compressor remanufacturing companies in the UK. The company supplies remanufactured compressors to Contractors in the refrigeration and air conditioning industry. These contractors work directly for the end user (i.e. Supermarkets, shops, offices, railways, marine vessels, wherever compressors are used to provide refrigeration and or air conditioning). On very rare occasions the company will deal with the end user. In most instances all remanufactured compressors are supplied on an exchange basis. The company supplies a compressor from stock and the old (broken/defunct) compressor is returned in exchange, or a surcharge is made. In cases where the company does not have a specific compressor in stock the contractor will return the broken compressor for ACES to remanufacture. In some instances ACES can carry out the remanufacture on site.

Remanufacturing Process: 1) Complete strip down, 2) Inspection of parts, 3) Replace and recycle, 4) Re-winding, 5) Cleaning, 6) Reassembly, 7) Testing. In addition, please see the attachment after this one-pager for details.

Business Model: The main challenge of this business is to source parts for compressors that are no longer manufactured and source specific compressor bodies to replace those that are found to be beyond economical repair/or scrapped. Since the company provides remanufacturing services, the customer group targeted is all refrigeration & air conditioning contractors both in the UK and sometimes overseas. As the company is utilizing the actual body casting in the remanufacturing process there are enormous savings. Roughly, it depends on the size/value of the compressor, the bigger the compressor body casting the bigger the value. Sometimes more than 60% of the cost of the new compressor can be achieved in the remanufacturing process. For customers' point of view, the benefit of the remanufactured compressor is financial (cost saving). Customers get the remanufactured products as good as newly manufactured products with the same warranty. The company sees their remanufacturing personnel and facilities as their key resources; such as quality fitters for compressor remanufacturing, qualified electrical rewinders, heavy duty plant and machinery in their facility, heavy duty lifting equipment, i.e. forklifts, overhead crane.

Economic Benefits

ACES strives to improve the efficiency of their remanufacturing. They recycle as many components as possible whilst conforming to the original manufactures specified tolerances. They also strive to increase company growth and use advertising to source new customers and make people more aware of the advantages of remanufactured compressors.

Environmental Benefits

The company has ISO14001 accreditation. Within the remanufacturing process, the waste oil from the broken compressors is burnt to provide heat in the factory using a special burner. The refrigerant usage is recorded and monitored in accordance with F Gas regulations. The company also uses recycled packaging to protect the remanufactured compressors in transit

Social Benefits – Jobs, Upscaling, etc.

The social benefit is the job opportunities created.

Advanced Materials Recovery

No advanced materials are recovered.

Attachment: THE REMANUFACTURING PROCESS

Every compressor that arrives in our factory follows an exact procedure;

- Each compressor is given a unique number stamped on the body casting – this number stays with the compressor for its life and is recorded on all relative correspondence. This number also goes into our computer database where the history of the compressor can be recalled at the push of a button.
- The first process is to drain the oil and completely strip down the compressor.
- All components are inspected and measured for size and tolerance using micrometers. Under certain circumstances it may be possible to re-grind the crankshaft and re-bore the cylinder bores which are carried out in-house.



- Components within the manufacturer's specified tolerances are recycled; all other components are replaced - unless contract requirements exist dictating replacement of specific parts.
- Valve reeds and piston rings are discarded regardless of condition. All valve plates are surface ground.
- The stator windings are removed, identified with the compressor and sent to our electrical re-wind department for testing or re-wind.

Each winding is subjected to 2000V-to-earth flash test, ohms readings are taken with a multi-meter and recorded, and then the winding is subjected to a full load test on a transformer. Any winding that fails these tests is rewound.

Rewind Process; prior to stripping out any winding, the coils are lifted and measured using a micrometer, and the amount of turns are counted. The coils of the stator winding are stripped out and the stator and rotor are cleaned. The details of the coil size and turns are entered into our specialist coil winding machine which winds the coils ready for installation. The stator windings are then wound by hand incorporating Class 'F' insulation, and impregnated with Freon-proof varnish.



Each winding is then subjected to 2000V-to-earth flash test, ohms readings are taken with a multi-meter and recorded, and then the winding is subjected to a full load test on a transformer.



■ All cast components, ie body, heads, end covers, are then thoroughly cleaned using a Vaqua wet blaster or degreaser tank.



■ The compressor is then reassembled by one of our experienced personnel and checks are made at every stage of the assembly.

■ Once assembled the compressor is bench-tested electrically with a flash tester again and ohms readings are recorded.



■ The compressor is then transferred to our Test Centre where it is subject to the most rigorous testing procedure on our unique, purpose-built test rig both open and under load. At this stage the compressor performance is recorded on the Rebuild & Test Certificate;

- Amp readings are taken to ensure that the three phases are balanced
- Oil pressure is taken whilst the compressor is run clockwise and again when the compressor is run counter clock-wise
- Oil return is checked via the sight glass
- Any unloading is checked for correct operation
- When the compressor has reached a minimum of 7bar head pressure, it is stopped and then restarted.
- A pump down test is carried out to ensure there is no let back across the discharge valve reeds.



- The test oil will be drained from the compressor and new oil charged in at the correct level.
- The compressor is then charged with 30bar Oxygen-free Dry Nitrogen and submerged under water to ensure that it is leak tight before being dehydrated and evacuated to 2torr or below.
- The compressor is then given a 2bar holding charge of OFN before being spray-painted in manufacturers original colour, unless otherwise specified.

