

Chip Sealed Runways

April 30, 2014



Government
of
Saskatchewan







Gravel



And chip sealed



Technically, what we are referring to as chip seals are graded aggregate seals.



- 1. Construction
- 2. Maintenance
- 3. Failures
- 4. Advantages
- 5. Disadvantages
- 6. Lifespan
- 7. Cost
- 8. Classification



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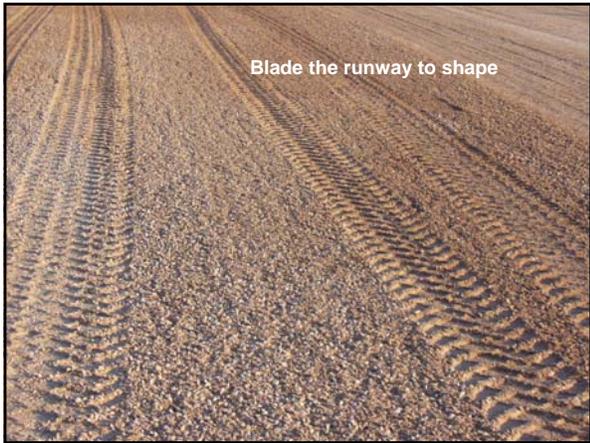
1. Construction



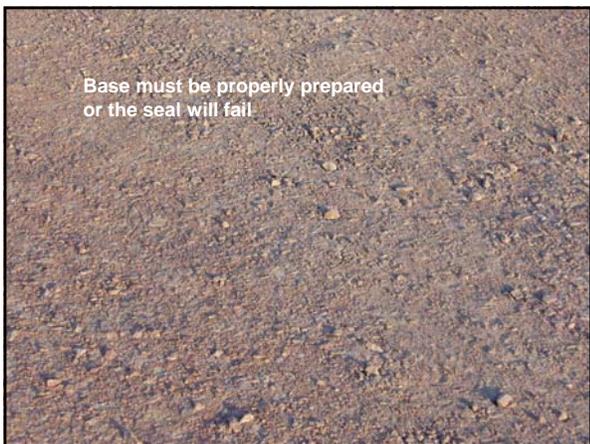
a. Preparation of the structure



Haul and spread base gravel on a good sub-base.











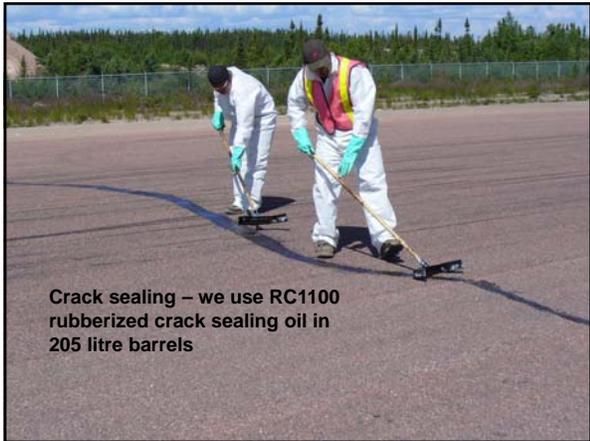
















Hand patch with cold mix asphalt



3. Failures

Care must be taken when plowing the runway in the fall and spring when the surface isn't frozen



Locked wheel turns will tear the seal





4. ADVANTAGES

- Hard surface (with properly prepared structure).
- Reduced rolling resistance compared to gravel.
- Provides drainage of surface water – structure doesn't become saturated.
- Virtually no dust or loose gravel once the seal sets up.
- Reduces prop damage.
- Eliminates blast erosion of aggregate.
- Better friction than asphalt concrete in the winter.
- HF150S is an emulsion – more environmentally friendly than petroleum cut asphalts used in asphalt concrete.
- Provides a higher percentage of use of the runway.



5. DISADVANTAGES

- Can be very costly in remote locations.
- Cannot store the liquid asphalt for more than several months.
- Extra equipment is required – oil distributor, sweeper, material spreader, oil storage – however equipment isn't very elaborate and sometimes is available locally.
- Surface can be damaged by maintenance equipment and aircraft.
- Repairs are more involved than on a gravel surface.
- May not be suitable for runways that are used by heavy aircraft.
- Aircraft tires sustain shallow cuts from new seals.
- Transport Canada does not consider sealed runways as asphalt; gravel limitations still apply.



6. COST

Cost varies greatly by location due to:

- Asphalt prices.
- Cost of aggregate production.
- Mobilization and freight costs – very costly in remote areas.
- Equipment availability.
- Amount of sub-base and base preparation.
- Where we have good road access, the cost works out to approximately \$3.00 m² (2013) for a single seal (not including preparation of the structure).



7. LIFESPAN

A properly applied double seal should last 10 years with very little maintenance.





8. CLASSIFICATION

- Chip sealed runways are classified by Transport Canada as "Treated Gravel". Runways are not classified as asphalt unless they are surfaced with 4 inches of HMAC.
- The Ministry, in conjunction with the Saskatchewan Aviation Council, has requested that chip sealed runways, which have a designed pavement structure, have a classification that acknowledges the hard surface, high CBR values, and low rolling resistance.
- The Ministry has suggested a new term, such as "Sealed Granular Pavement" – which acknowledges a hard surface, thereby eliminating the gravel runway restrictions.
- This work is ongoing.



ECONOMIC IMPACT

- The existing classification is viewed as a disincentive to economic development, including air tourism.
- The current classification limits the operation of aircraft using these runways by imposing a 15% restriction in operating weight as compared to asphalt runways.
- This limits the economies of scale that would otherwise be achieved, resulting in higher per passenger cost and higher freight charges.
- New technologies cannot be taken advantage of as newer, larger aircraft that are not gravel certified cannot be deployed.



- Commodities are at the heart of the global economy and northern Canada has an abundance of resources. Our core transportation services need to provide access for development , innovation and productivity.
- Airports enable job creation by providing access to remote and distant communities that supply labour force to the resource and mining sectors.
- A northern airport network is critical for providing community access, employment opportunities, business and industry development, forest fire management, and quality of life and safety for northern residents.
- Chip sealing is an investment that aids in improving the airport infrastructure and is a benefit to northern residents, air carriers, and the province as a whole.



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Questions???

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