Titanium in the Golf Industry

Titanium USA
September 26, 2016
Presentation Layout

• Beginnings of Golf Equipment
• From Wood to Metal
• Introduction of Titanium
• Titanium Today
Beginnings of Golf Equipment

• Golf began in the 1500s in Scotland
• Clubheads were originally carved from hard woods (beech, holly)
• Shafts were made from ash or hazel
Beginnings of Golf Equipment

- Clubs were extremely costly
- Short life spans
Beginnings of Golf Equipment

• Clubheads eventually went to persimmon
• Shafts changed primarily to hickory with some trying steel in the late 1800s
From Wood to Metal

• By 1900s golf clubs began to be forged out of iron & steel

• In the 1960s, Karsten Solheim introduced the first cast irons
From Wood to Metal

• By 1980s, hollow metal woods became more common, casting from stainless steels along with graphite shafts.

• By 1990s oversized heads had become common.
Introduction of Titanium

• Titanium alloys had been used in aerospace industry for a long time
• The 90s saw a big influx of Titanium Alloy drivers
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How do we use titanium alloy today in the golf industry?
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Drivers

Cast Body

Rolled Sheet or Forged Face
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Drivers – Bodies

• Cast alloys:
  Ti 6-4
  Ti 8-1-1

• Important factors:
  strength + ductility & good flow behavior

(not golf components)
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Drivers – Faces

• Sheet or Forged alloys:
  Ti 6-4
  SP-700
  Ti 15-3-3-3

• Important factors: strength & modulus
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Metalwoods
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Metalwood – Faces

• Sheet or Forging alloys:
  Ti 6-4
  SSAT-2041
  SP-700
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Irons
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Putters
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Shafts
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Golf Balls
Citations


Questions?