



Making dent-mapping easy: A Case Study

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NDT

NONDESTRUCTIVE
TESTING FORUM

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www.8-tree.com

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About easyJet

- Innovative pioneer of low-cost aviation model
- Europe's leading short-haul airline
- 279 aircraft – exclusively Airbus (A319, A320, A320neo)
- Maintenance Operations:
 - EZY bases – Luton and London Gatwick (4 narrow-body bays)
 - Several 3rd party MRO bases across Europe
- Committed to innovation & digital leadership in aviation

EUROPE'S NUMBER ONE NETWORK

Primary airports, routes and slots combined with easy and affordable travel for our customers

132

AIRPORTS

31

COUNTRIES

802

ROUTES



About dentCHECK

- Aviation industry's tool-of-choice for 3D dent-mapping & reporting



For all A300, A320, A330, A340 and A380 families

AMM 51-00-00 / SRM 51-11-00 / TEB 300-A3327-1 / TEB 320-A3497-1 / TEB 340-A3505-1 / TEB 380-A3351-1



For all 7x7, DC and MD aircraft

Dedicated Service Letter (SL) consistent with dentCHECK performance spec

- Purpose-built tool for the aviation industry
- Empowers operators with SRM-compliant 'go/no-go' decisions instantly
- Expedites blend-out, lightning strike assessment and rework

The Dent-mapping Problem

The Challenge	Desired Solution
Achieve reliable, accurate and objective mapping/reporting for – <ul style="list-style-type: none">- Dents- Blend-outs- Lightning strikes	Fast (preferably real-time)
	Reliable & consistently accurate
	OEM recognized + SRM-compliant
	Answers...not just data
	Handheld portability
No surface preparation required	



Hail Damage (Image source: easyJet)



Lightning strike (Image source: Boeing)



Ground equipment damage (Image source: Wikipedia)

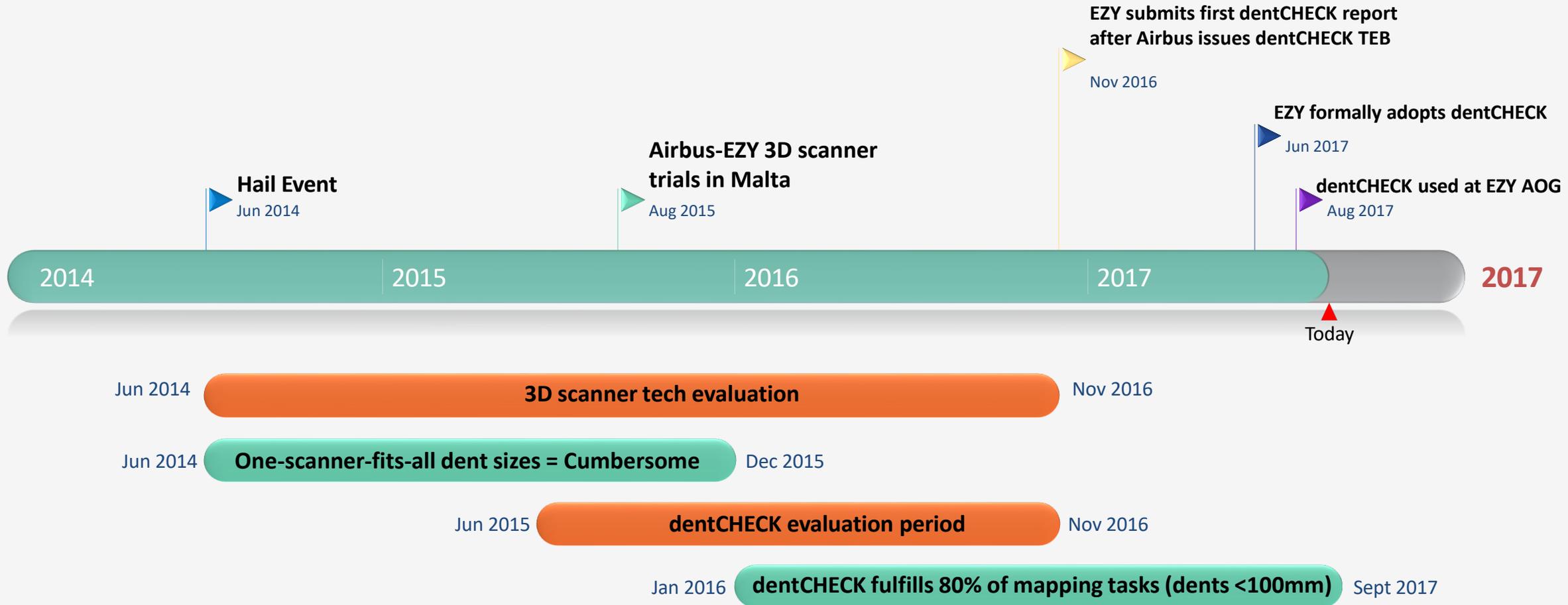
Traditional tools – easyJet experience

- Slow
- Complex
- Increasingly inaccurate for dent $>50\text{mm}$ diameter
- Very subjective
- Poor repeatability
- Limited to A&P/B1 engineer skill-level (airframe/engines)



Image source: easyJet

3D scanners – easyJet history



easyJet criteria	dentCHECK performance	dentCHECK enabling advantage
AOG events	Quick early results	Single-shot real-time scan with AR-enabled 'go/no-go' results
Measurement quality	Very accurate, repeatable and objective	OEM & National Lab certified performance
Reporting	Fast detailed reports from the comfort of engineering offices	dentCHECK DRT™ reporting software
Ease of Use	Easy. B1 (Airframe/Engines) and B2 (Avionics) engineers can perform dent assessment to the same standard	Zero-learning curve™ & No surface prep
Accessibility of Results	Results can be uploaded to the network for 'anytime' interrogation/review by structures specialists located at a remote location and/or OEM experts	Wireless and fully-networked design (WiFi, USB, Bluetooth)

How it Works – *Dent-map Inspection* with dentCHECK

- Point & click (1-button operation)
- Auto transfer dent-map results to Engineering teams (via USB or WiFi)

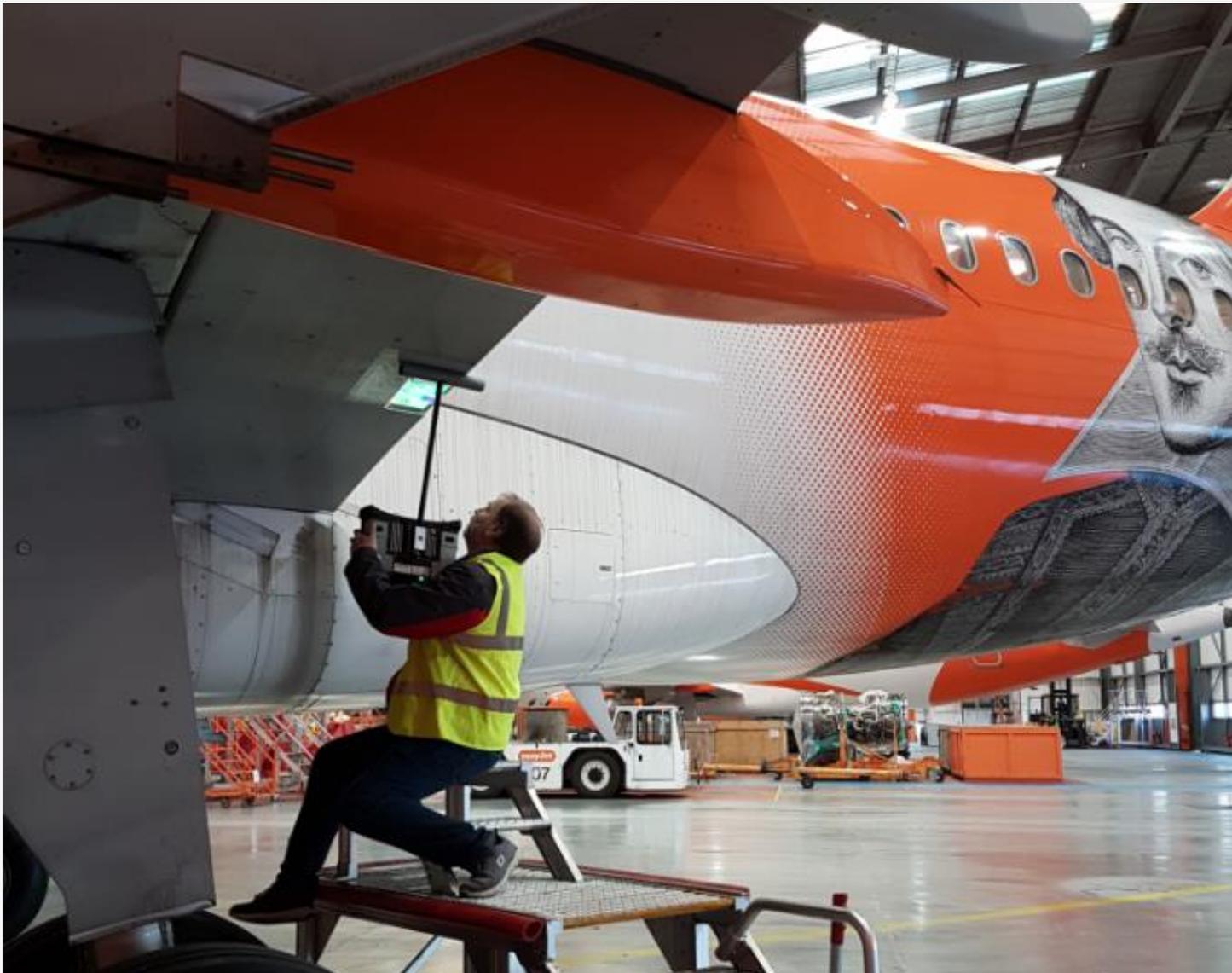
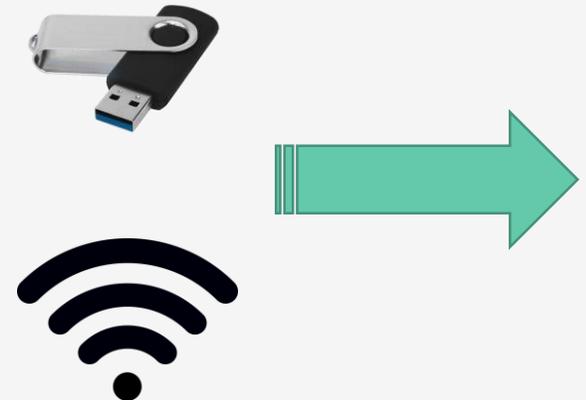
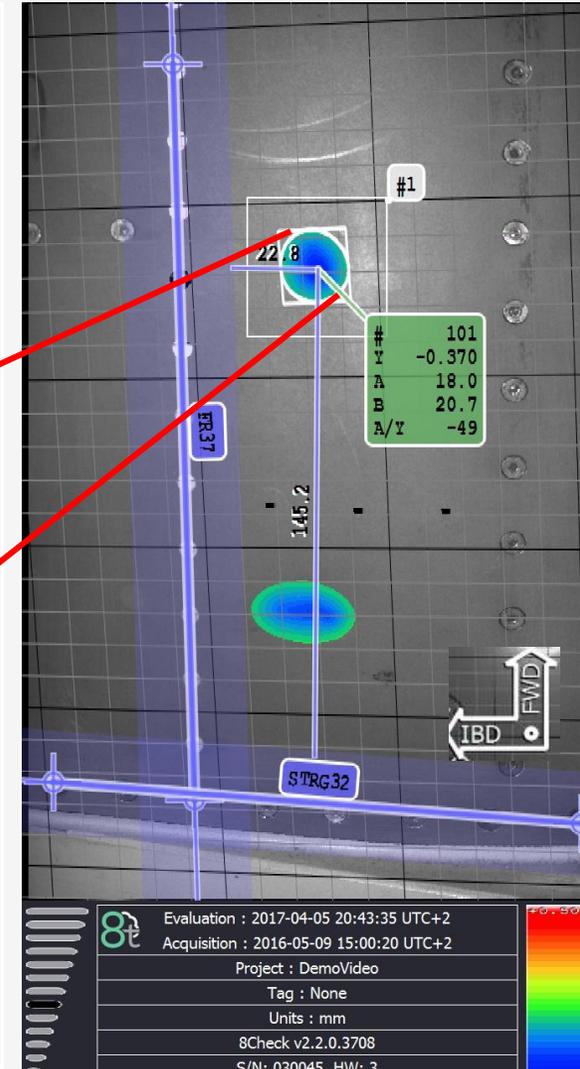
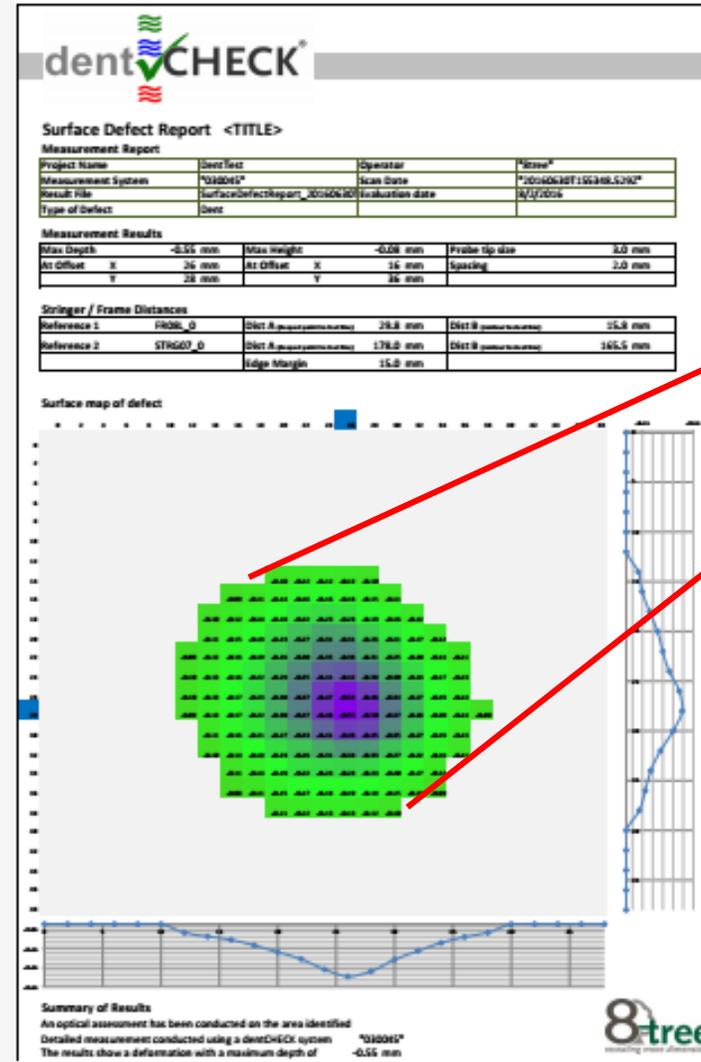


Image source: easyJet

How it Works – Dent Reports with DRT™



- Engineering team PCs loaded with Dent Reporting Tool (DRT) software to receive incoming dent-maps
- Using DRT = Detailed reports in < 5min
 - Vertical/horizontal deepest point of dent
 - Gridding
 - Coordinate symbols
 - Distances to neighboring dents
 - Distance to adjacent frames/stringers
 - 3D and 2D photos for surrounding context
 - Dent severity profile information



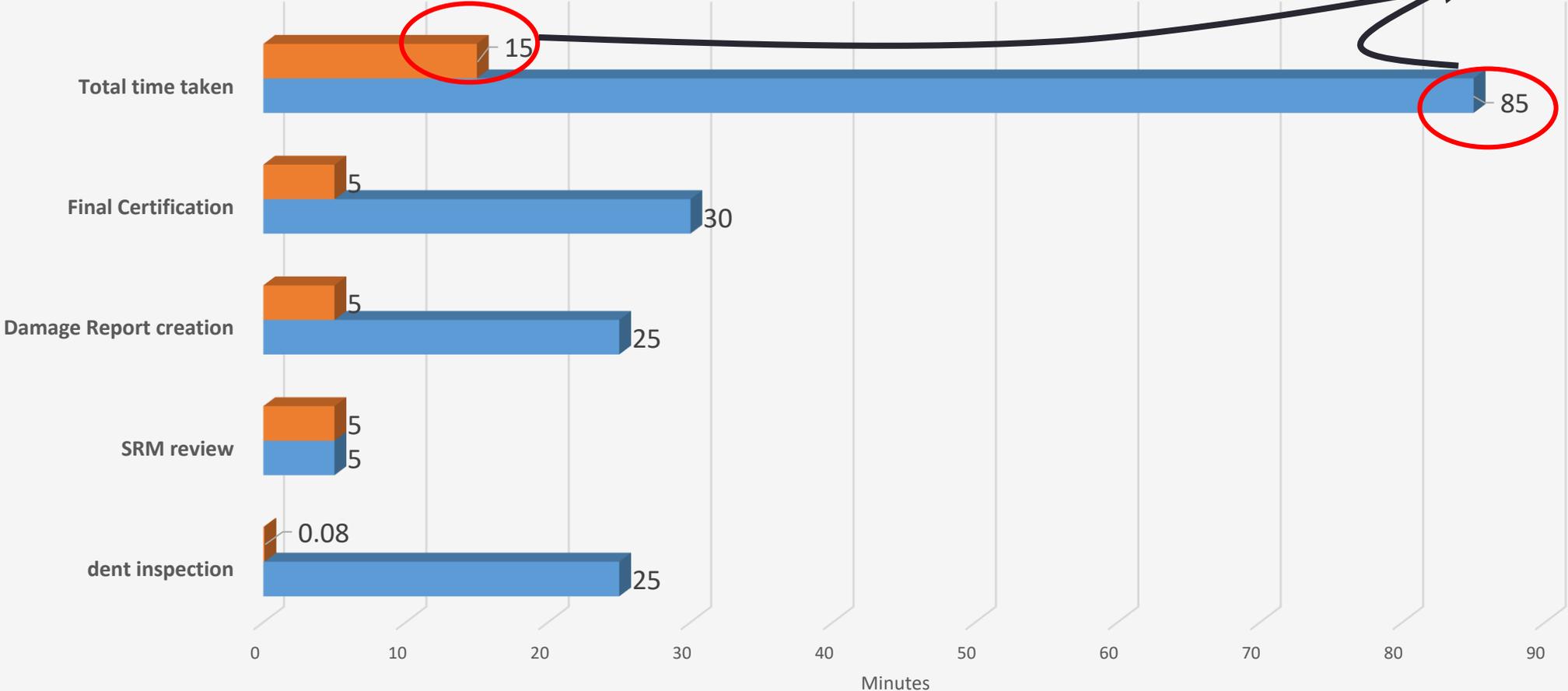
Efficiency Gains dentCHECK



@ easyJet

Time to Disposition a Dent

With dentCHECK Traditional method



83% time-savings to disposition dents

- dentCHECK used to supplement traditional inspection methods
- Consistently accurate results in a fraction of the time
- dentCHECK report submitted to Airbus (within hours of TEB issuance) – resulting in 1000FC temporary certification from

Airbus

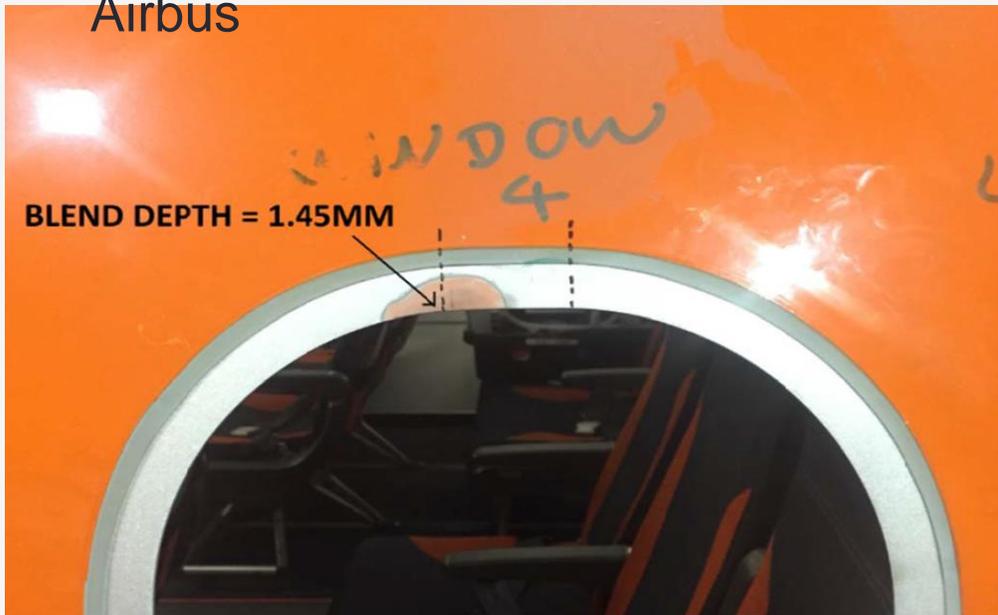


Image source: easyJet

Surface Defect Report

Measurement Report

Aircraft Registration	G-EZWT	Operator	easyJet
Measurement System	020028	Scan Date	20161130T105051.864Z
Flight Cycles	4718	Flight Hours	10327
Assessment Date	30/11/2016		

Measurement Results

Maximum Depth	-1.451 mm	Maximum Length	41.90 mm	Probe Tip Size	3.0 mm
	mm	Maximum Width	12.20 mm	Grid Spacing	2.5 mm

Stringer / Frame Distances

Reference 1	No_Ruler	Dist A (mm) to next hole	0.00 mm	Dist B (mm) to next hole	0.00 mm
Reference 2	No_Ruler	Dist A (mm) to next hole	0.00 mm	Dist B (mm) to next hole	0.00 mm
		Safety Margin (Ref 1)	0.00 mm	Safety Margin (Ref 2)	0.00 mm

Defect Surface Map

Results Summary

- An optical assessment has been conducted on the area shown above.
- Detailed measurement conducted using dentCHECK system: 020028
- Measured deformation(s) have extremums: Min = -1.45 mm Max = 41.90 mm

easyJet's experience with dentCHECK



- “When looking at damage measurement solutions we considered **ease of use, flexibility, information provided and cost per unit.**”
- “We were impressed with the **speed and relative simplicity of the 8tree system** compared with other available systems and worked closely with 8tree to assist with development of the system to better suit our requirements.”
- “The dentCHECK system and the associated I.T. support are currently **being integrated into easyJet’s maintenance operation for both routine and AOG events.**”
- “We are confident it **will prove to be a great benefit to maintenance operations allowing us to return aircraft to service more quickly and efficiently** therefore reducing disruption.”

– *Gary Smith*
Head of Engineering
easyJet

What operators want = What operators get

Ease of Use

High Accuracy

Consistency & Objectivity

No surface preparation

Quick out-of-box experience

Instant analysis = Faster TaT



Image source: easyJet



Never look away from the aircraft...

...eyes always on task!

Questions?

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