BRITISH STANDARD AEROSPACE SERIES

BS 2SP 142 and SP 143: 1973+A3:2013

Specification for

Solid rivets with 100° countersunk truncated radiused head made from BS L 86 (SP 142) and BS L 37 (SP 143) materials

Index form of title: Rivets, solid, 100° countersunk truncated radiused head, in L 86 and L 37 materials

ICS 49.030.60

Foreword

Publishing information

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Supersession

BS 2SP 142 and SP 143: 1973+A3:2013 supersedes BS 2SP 142 and SP 143: 1973 (incorporating Amendments No.1 and No.2), which are withdrawn.

Information about this document

Text introduced or altered by Amendment No. 3 is indicated in the text by tags ⟨A3⟩ ⟨A3⟩. Minor editorial changes are not tagged. Previous amendments are not indicated.

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This British Standard, having been approved by the Aerospace Industry Standards Committee, was published under the authority of the Executive Board on 30 November 1973

The following BSI references relate to the work on this standard:

Committee reference ACE/14
Draft for approval 72/35896
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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 5 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Amendments issued since publication

Amd. No.	Date	Comments
2393	November 1977	
3268	July 1980	
A3	May 2013	See Foreword.

Contents

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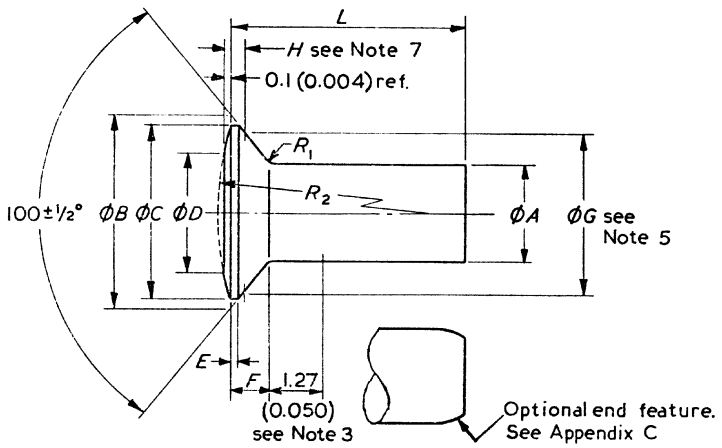


Figure 1 — Details of rivets

Table 1 — Dimensions

Size dash no.		– 24	– 32	– 40	– 48	– 56	– 64	– 80	– 96
Nominal diameter		2.4 (0.094)	3.2 (0.126)	4.0 (0.157)	4.8 (0.189)	5.6 (0.220)	6.4 (0.250)	8.0 (0.315)	9.6 (0.378)
∅ *A* see Note 4	max.	2.46 (0.097)	3.25 (0.128)	4.04 (0.159)	4.83 (0.190)	5.63 (0.222)	6.43 (0.253)	8.00 (0.315)	9.60 (0.378)
	min.	2.36 (0.093)	3.15 (0.124)	3.94 (0.155)	4.73 (0.186)	5.53 (0.218)	6.33 (0.249)	7.90 (0.311)	9.50 (0.374)
∅ *B* to sharp corners (ref. only)	max.	4.63 (0.1825)	5.80 (0.2285)	7.37 (0.2900)	9.08 (0.3575)	10.64 (0.4190)	12.20 (0.4805)	14.45 (0.5690)	17.77 (0.6995)
	min.	4.46 (0.1755)	5.63 (0.2215)	7.16 (0.2820)	8.85 (0.3485)	10.41 (0.4100)	11.97 (0.4715)	14.20 (0.5590)	17.49 (0.6885)
∅ *C*	abs. min.	4.17 (0.164)	5.28 (0.208)	6.78 (0.267)	8.36 (0.329)	9.80 (0.386)	11.30 (0.445)	13.36 (0.526)	16.51 (0.650)
∅ *D*	min.	2.40 (0.094)	3.20 (0.126)	4.00 (0.157)	4.80 (0.189)	5.60 (0.220)	6.40 (0.250)	8.00 (0.315)	9.60 (0.378)
E	ref.	0.20 (0.008)	0.23 (0.009)	0.25 (0.010)	0.30 (0.012)	0.36 (0.014)	0.38 (0.015)	0.46 (0.018)	0.51 (0.020)
F	ref.	0.91 (0.036)	1.07 (0.042)	1.40 (0.055)	1.78 (0.070)	2.11 (0.083)	2.41 (0.095)	2.70 (0.106)	3.40 (0.134)
∅ *G* Gauging dia.		3.84 (0.151)	4.88 (0.192)	6.17 (0.243)	7.57 (0.298)	8.89 (0.350)	10.19 (0.401)	12.19 (0.480)	14.94 (0.588)
H Protrusion above gauging dia. *G*	max.	0.44 (0.0172)	0.49 (0.0193)	0.60 (0.0237)	0.74 (0.0290)	0.84 (0.0329)	0.95 (0.0374)	1.05 (0.0413)	1.29 (0.0508)
	min.	0.36 (0.0143)	0.41 (0.0164)	0.52 (0.0204)	0.64 (0.0252)	0.74 (0.0291)	0.85 (0.0336)	0.94 (0.0371)	1.17 (0.0462)
R_1 Radius	max.	0.25 (0.010)	0.25 (0.010)	0.38 (0.015)	0.38 (0.015)	0.38 (0.015)	0.38 (0.015)	0.38 (0.015)	0.38 (0.015)
	min.	0.10 (0.004)	0.10 (0.004)	0.20 (0.008)	0.20 (0.008)	0.20 (0.008)	0.20 (0.008)	0.20 (0.008)	0.20 (0.008)
R_2 Radius	nom.	8.0 (0.315)	12.0 (0.472)	20.0 (0.787)	30.0 (1.181)	4.00 (1.575)	50.0 (1.969)	70.0 (2.756)	90.0 (3.543)

Table 1A — Length dimensions

Size dash no.			-24	-32	-40	-48	-56	-64	-80	-96
Length dash no.	-04	4 (0.157)								
	-06	6 (0.236)								
	-08	8 (0.315)								
	-10	10 (0.394)								
	-12	12 (0.472)								
	-14	14 (0.551)								
	-16	16 (0.630)	⊠							
	-18	18 (0.709)								
	-20	20 (0.787)		⊠						
	-22	22 (0.866)								
	-24	24 (0.945)								
	-26	26 (1.024)			⊠					
	-28	28 (1.102)				⊠				
	-30	30 (1.181)								
	-32	32 (1.260)					⊠	⊠		
	-35	35 (1.378)							⊠	⊠
	-40	40 (1.575)								
	-45	45 (1.772)								
	-50	50 (1.969)								
	-55	55 (2.165)								
	-60	60 (2.362)								

$L^{+0.5\ (0.020)}_{-0}$

LENGTH RANGE

* Non-preferred length.

⊠ Maximum available length of rivets with radiused tails is indicated indicated thus in each size column. See Note 11.

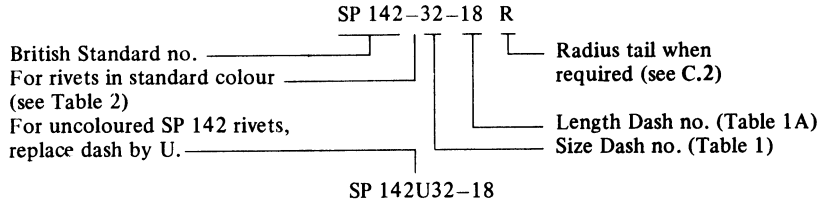
NOTE Undyed versions of rivets in L 86 material are also available. See Note 9.

Table 2 — Material

BS SP number	Material	Finish		Identification mark (See Appendix B)
	British Standard	Protective treatment	Colour	
BS SP 142	BS L 86[a]	Anodise to 〚A3〛 Def Stan 03-25 〚A3〛	Violet to DTD 913	o Indented
BS SP 143	BS L 37[a]	None	Plain	— o — Embossed
[a] Latest issue.				

NOTE 1 Dimensions and tolerances are in millimetres, inch conversions are in parentheses.
NOTE 2 Heat treatment shall be as stated in Appendix A.
NOTE 3 ∅ *A* may increase gradually over this length to ∅ *A* max. + 0.05 (0.002) at point of tangency with fillet radius.
NOTE 4 Remove burrs 0.25 (0.010) max.
NOTE 5 ∅ *G* to be concentric with shank within 0.25 (0.010) T.I.R.
NOTE 6 Maximum head cocking angle relative to rivet axis = ½°.
NOTE 7 Refer to BS SP 68 to BS SP 71 for gauging method.
NOTE 8 Do not use unassigned part numbers.

NOTE 9 Example of call up:



NOTE 10 Rivets shall be packaged, bagged or labelled, and such packages, bags, labels shall bear the complete appropriate part number as illustrated above.

NOTE 11 Appendix C gives details of rivets with radiused tails for use in auto-riveting machines.

Appendix A Heat treatment

A.1 SP 142 — L 86 Material

Rivets to BS SP 142 shall be heat treated by the rivet manufacturer as follows.

Solution treat at a temperature of 495 ± 5 °C and quench in water at a temperature not exceeding 40 °C. Age at room temperature for not less than four days.

A.2 SP 143 — L 37 Material

A.2.1 Immediately before use or before refrigeration as described below, rivets to BS SP 143 shall be heated uniformly at a temperature of 495 ± 5 °C and quenched in water at a temperature not exceeding 40 °C.

A.2.2 Rivets to BS SP 143 commence to age harden immediately when kept at atmospheric temperature after quenching. Ageing may be delayed, however, by storing the rivets at low temperatures after quenching, and they may be expected to remain in a condition suitable for closing for a period depending on the storage temperature as shown below:

Temperature	Maximum storage period
0 °C to – 5 °C	45 hours
– 15 °C to – 20 °C	150 hours

The rivets shall be closed within two hours of solution treatment if kept at atmospheric temperature or within two hours of removal from cold storage.

Appendix B Rivet markings: position and dimensions

B.1 Identification and marking

B.1.1 The marking of the rivets shall be as specified in Table 2 and shall be applied as follows.

1) Rivets over size – 24 diameter which do not exceed 8 diameters in length shall be marked on the shank end with the exception of – 32 diameter which may be marked on the head.

2) Size – 24 diameter rivets in all lengths, and rivets over size – 24 diameter which exceed 8 diameters in length may be marked on either the head or the shank end.

The marking, whether indented or embossed, shall be clearly visible, and height or depth shall not exceed the following dimensions.

0.15 mm (0.006 in) on sizes up to and including size – 32 diameter;

0.2 mm (0.008 in) on sizes – 40 and – 48 diameter;

0.25 mm (0.010 in) on sizes – 56 diameter and over.

B.1.2 The rivets shall be identified for ordering purposes by the relevant part number. (See Note 9.)

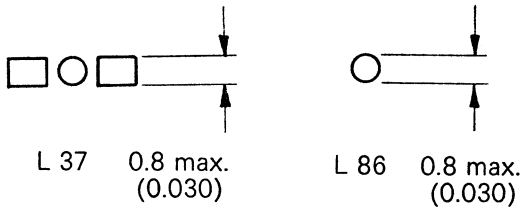
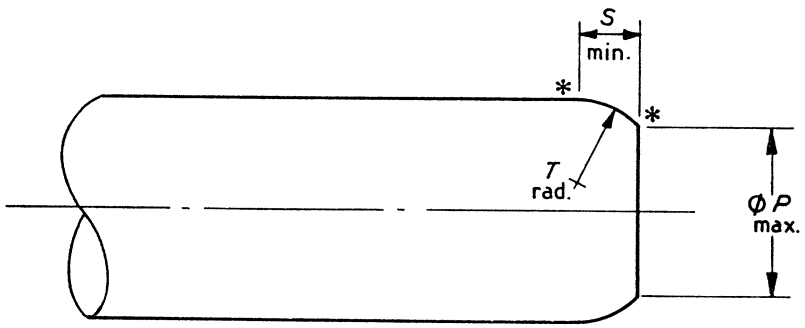


Figure 2 — Dimensions of identification marks

Appendix C Rivets for use in auto-riveting machines

C.1 With the advent of auto-riveting machines, it is necessary to form the rivet tail with a small radius. Conventional methods of riveting are unaffected by this feature.



*Intersection points

Figure 3 — Detail of radiused tail

Table 3 — Dimensions of radiused tails

Nominal dia.	*S* **min.**	*T* **(rad) ± 0.25 (0.010)**	**Dia.** *P* **max.**
mm (in)	mm (in)	mm (in)	mm (in)
2.4 (0.094)	0.46 (0.018)	0.74 (0.029)	1.98 (0.078)
3.2 (0.126)	0.66 (0.026)	0.98 (0.039)	2.59 (0.102)
4.0 (0.157)	0.86 (0.034)	1.24 (0.049)	3.25 (0.128)
4.8 (0.189)	1.07 (0.042)	1.50 (0.059)	3.89 (0.153)
5.6 (0.220)	1.24 (0.049)	1.75 (0.069)	4.60 (0.180)
6.4 (0.250)	1.45 (0.057)	1.98 (0.078)	5.13 (0.202)
8.0 (0.315)	1.86 (0.073)	2.50 (0.098)	6.30 (0.248)
9.6 (0.378)	2.26 (0.089)	2.97 (0.117)	7.47 (0.294)

C.2 Rivets of standard lengths and diameters, up to the maximum available lengths indicated thus  as shown in Table 1A, may be supplied with radius tails on request.

The method of call up is given in Note 9.

C.3 *Deleted.*

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