

# DIN EN ISO 21368:2024-10 (E)

Adhesives - Guidelines for the fabrication of adhesively bonded structures and reporting procedures suitable for the risk evaluation of such structures (ISO 21368:2022)

---

<b>Contents</b>		<b>Page</b>
European foreword .....		5
Foreword .....		6
Introduction .....		7
<b>1</b>	<b>Scope .....</b>	<b>9</b>
<b>2</b>	<b>Normative references .....</b>	<b>10</b>
<b>3</b>	<b>Terms and definitions .....</b>	<b>10</b>
<b>4</b>	<b>Core element 1: Classification of adhesively bonded joints according to safety requirements .....</b>	<b>17</b>
4.1	General .....	17
4.2	Definition of safety classes .....	18
4.3	Documentation of the classification according to safety classes .....	19
<b>5</b>	<b>Core element 2: Adhesive bonding personnel (ABP) – Competences, knowledge and experiences .....</b>	<b>19</b>
5.1	General .....	19
5.2	Adhesive bonding operators (ABO) .....	20
5.2.1	General .....	20
5.2.2	Functions .....	20
5.2.3	Duties .....	20
5.2.4	Competences, knowledge and experiences .....	20
5.3	Adhesive bonding coordinator (ABC) .....	21
5.3.1	General .....	21
5.3.2	Functions .....	21
5.3.3	Duties .....	21
5.3.4	Competences .....	23
5.3.5	Organizational integration of adhesive bonding coordination .....	23
5.4	Levels of competences, knowledge and experiences for adhesive bonding personnel (ABP) .....	24
5.4.1	General .....	24
5.4.2	Requirements for each level of competences, knowledge and experiences .....	24
5.5	Assignment of the three competence levels to the safety classes depending on the respective scope of work – Correlation of the core elements .....	26
5.6	Comparability of competences, knowledge and experience .....	27
5.7	Monitoring, inspection and testing personnel .....	27
<b>6</b>	<b>Core element 3: Design and verification of adhesively bonded joints .....</b>	<b>27</b>
6.1	General .....	27
6.2	Assignment to safety classes .....	27
6.3	Requirements to be met by the adhesively bonded joints .....	28
6.4	Design of adhesively bonded joints .....	28
6.5	Adherends .....	28
6.6	Adhesive .....	28
6.7	Surface treatment .....	29
6.8	Factors affecting the adhesive bonding process .....	29
6.9	Verification .....	29
6.9.1	General .....	29
6.9.2	Method 1 – Load in use < maximum load capacity .....	29

6.9.3	Method 2 -- Component testing .....	30
6.9.4	Method 3 -- Documented experience .....	30
6.9.5	Method 4 -- Combination of methods 1 to 3 .....	30
7	Drafting contracts and subcontracting (outsourcing) .....	30
7.1	General .....	30
7.2	Subcontracting (Outsourcing) .....	31
7.2.1	General .....	31
7.2.2	Deciding on subcontracting .....	32
7.2.3	Details and documentation of procurement .....	32
7.2.4	Selection of external service provider (subcontractor/supplier) and contracting .....	32
7.2.5	Management of external service providers (subcontractors/suppliers) .....	33
8	Workmanship .....	33
8.1	General .....	33
8.2	General process requirements .....	33
8.2.1	Production planning .....	33
8.2.2	Process design .....	33
8.2.3	Planning the use of production aids and tools .....	34
8.2.4	Production documents .....	35
8.2.5	Process approval .....	35
8.2.6	Transport, storage and logistics for adhesives, auxiliary materials and adherends .....	35
8.2.7	Production environment .....	36
8.2.8	Materials .....	37
8.2.9	Preparation of work stations and acclimatization of materials .....	37
8.2.10	Health and safety and environmental protection .....	38
8.2.11	Checking for fitting accuracy concerning shape, position and dimension .....	38
8.2.12	Checks prior to start of production .....	38
8.2.13	Treatment of the adherend surfaces .....	39
8.2.14	Dosing, mixing and application .....	40
8.2.15	Inspection and testing during adhesive bonding and adhesive solidification .....	41
8.2.16	Joining the adherends .....	41
8.2.17	Fixing .....	42
8.2.18	Solidification of the adhesive .....	42
8.2.19	Inspection and testing of finished components .....	43
8.2.20	Packaging and transport of adhesively bonded components .....	43
8.3	Work instructions: minimum requirements .....	34
8.4	Process reliability .....	45
8.4.1	General .....	45
8.4.2	Quality planning .....	45
8.4.3	Control of planning and manufacturing documents .....	45
8.4.4	Process validation .....	45
8.4.5	Production-accompanying work samples as proof of application quality .....	446
8.4.6	Quality control of process reliability/traceability .....	47
8.4.7	Instruction of adhesive bonding personnel (ABP) .....	48
8.4.8	Post-adhesive bonding finishing .....	48
8.5	Rework .....	48
8.6	Quality assurance .....	48
8.6.1	General .....	48
8.6.2	Quality planning .....	48
8.6.3	Quality inspection .....	49
8.6.4	Action in the case of deviations .....	49
8.6.5	Monitoring of measuring and test equipment and of production aids and tools .....	50
8.6.6	Imperfections in adhesively bonded joints .....	50
8.6.7	Control of non-conforming products .....	51
8.6.8	Preventive and corrective action .....	51
9	Maintenance and repair .....	51
9.1	General .....	51
9.2	Planning of maintenance and repair .....	51
9.3	Maintenance and repair instructions .....	52
9.4	Performing maintenance work/execution rules .....	52

<b>9.5</b>	<b>Documentation .....</b>	<b>53</b>
<b>9.6</b>	<b>Sub-contracting .....</b>	<b>53</b>
<b>Annex A (informative) Assistance for providing adhesive bonding technology competences .....</b>		<b>54</b>
<b>Annex B (informative) Requirements .....</b>		<b>71</b>
<b>Annex C (informative) Guideline for the implementation of the design of adhesively bonded joints and its verification .....</b>		<b>72</b>
<b>Annex D (informative) Criteria for choosing an adhesive bonding system .....</b>		<b>91</b>
<b>Annex E (informative) Description of non-destructive and destructive testing methods .....</b>		<b>94</b>
<b>Annex F (informative) Description of accelerating ageing tests .....</b>		<b>97</b>
<b>Annex G (informative) Examples of non-decorative and decorative imperfections of adhesive bonds .....</b>		<b>101</b>
<b>Annex H (informative) Example of a job history sheet .....</b>		<b>103</b>
<b>Annex I (informative) Notes on quality planning .....</b>		<b>104</b>
<b>Bibliography .....</b>		<b>106</b>