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1 Scope of application

This technical code gives an overview of the shear and peeling tests on joints between polymeric materials.

2 Overview list of the peeling and shear tests

Test		Joining process*	Materials*	Application	Standards, technical codes and guidelines
Peeling tests	Peel decohesion test	HM	PE	Pipes	ISO 13954
		HD	PE, PP, PB and PVDF	Pipes	DIN EN 12814-4
	Peeling test	HH, WE and WU Diffusion and adhesive bonding	PE, PP, PVC-P, ECB, E-VA, EPDM, CR, NBR, CSM, IIR and PVC-P	Sheets	DVS 2225-2 DIN EN 12316-2 DVS 2226-3 DIN EN 12316-2
	Radial peeling test, manual	HM and HD	PB, PE, PE-X, PP and PVDF	Pipes	DVS 2203-6, Supp. 1 DVS 2212-1
	Manual peeling test	HM	PE (shell pipes)	Pipes	DVS 2207-5
PE, PP, PB; PVDF and PE-X			Pipes	DIN EN 12814-4	
Roller peeling test	Adhesive-bonded joints	–	Panels Sheets	DIN EN 1464 DVS 2203-6, Supp. 2	
Shear tests	Torsion shear test, manual	HM and HD	PB, PE, PE-X, PP and PVDF	Pipes	DVS 2203-6, Supp. 1 DVS 2212-1
	Torsion shear test, mechanised	HM and HD	PB, PE, PE-X, PP and PVDF	Pipes	DVS 2203-6, Supp. 1
	Ring shear test	Adhesive-bonded joints	PVC-U, PVC-C, ABS, PS and fibre composite	Pipes	DVS 2204-1, -3 and -5 ISO 9311-2 DVS 2203-6, Supp. 2
		Overlaminated joints	Fibre composite	Pipes	DIN 53769-1
	Segment shear test	Overlaminated joints Adhesive-bonded joints	Fibre composite	Pipes	DIN 53769-1
	Tensile shear test	Overlaminated joints	Fibre composite	Pipes Panels	DIN EN ISO 527-4
Tensile shear test	HH, WE and WU	PE, PP, PVC-P, ECB, E-VA, EPDM, CR, NBR, CSM, IIR and PVC-P	Sheets	DVS 2226-2 DIN EN 12317-2	

* For abbreviations: See the following table

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DVS, Technical Committee "Working Group "Joining of Plastics"

Joining process	
HD	Heated tool sleeve welding
HH	Heated wedge welding
HM	Sleeve welding with an incorporated electric heating element
WE	Hot gas extrusion welding
WU	Hot gas lap welding
Materials	
ABS	Acrylonitrile butadiene styrene
CR	Chloroprene rubber
CSM	Chlorosulphonated polyethylene
ECB	Ethylene copolymer bitumen
EPDM	Ethylene propylene terpolymer
EVA	Ethylene vinyl acetate
IIR	Butyl rubber
NBR	Nitrile rubber
PB	Polybutene
PE	Polyethylene
PE-X	Cross-linked polyethylene
PP	Polypropylene
PS	Polystyrene
PVC-U	Unplasticised polyvinyl chloride
PVC-P	Plasticised polyvinyl chloride
PVC-C	Chlorinated polyvinyl chloride
PVDF	Polyvinylidene fluoride

3 Standards, technical codes and guidelines which are also applicable

DIN 16970	Adhesives for the joining of pipes and piping parts made of hard PVC – General quality requirements and tests
DIN 53769-1	Testing of piping made of glass-fibre-reinforced plastics – Determination of the bond shear strength of piping parts corresponding to Pipe Type B
DIN EN 1464	Adhesives – Determination of the peeling resistance of high-strength adhesive-bonded joints – Roller peeling test
DIN EN 1465	Adhesives – Determination of the tensile shear strength of high-strength adhesive-bonded lap joints
DIN EN 12316-2	Sealing sheets – Determination of the peeling resistance of the joining welds – Part 2: Plastic and elastomer sheets for roof sealing
DIN EN 12317-2	Sealing sheets – Determination of the shear resistance of the joining welds – Part 2: Plastic and elastomer sheets for roof sealing
DIN EN 12814-4	Testing of welded joints between thermoplastics – Part 4: Peeling test
DIN EN ISO 527-4	Plastics – Determination of the tensile properties – Part 4: Testing conditions for plastic composite materials with isotropic and anisotropic fibre reinforcement
DIN EN ISO 9311-2	Adhesives for thermoplastic joining systems – Part 2: Determination of shear strength
ISO 13954	Plastic pipes and fittings – Peeling strength testing of polyethylene (PE) electrofusion joints with a nominal diameter greater than or equal to 90 mm
DVS 2204-3	Adhesive bonding of thermoplastics; polystyrene and generally related plastics
DVS 2204-5	Adhesive bonding of pipes and fittings made of thermoplastics – Chlorinated polyvinyl chloride (PVC-C)
DVS 2205-5	Adhesive bonding of pipes and fittings made of thermoplastics – Chlorinated polyvinyl chloride (PVC-C)
DVS 2207-5	Welding of thermoplastics – Welding of PE shell pipes – Pipes and piping parts
DVS 2212-1	Qualification testing of plastics welders – Qualification Test Groups I and II
DVS 2225-2	Joining of sealing sheets made of polymeric materials in earthwork construction and water engineering – Site tests
DVS 2226-2	Testing of joints between sealing sheets made of polymeric materials – Tensile shear test
DVS 2226-3	Testing of joints between sealing sheets made of polymeric materials – Peeling test